OHIC Aligned Measure Set 2019 Annual Review
Specifications for Measures Under Discussion on August 27, 2019

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Specifications for CAHPS, HCAHPS, and PCMH CAHPS surveys are not included in this document.

Thirty-Day All-Cause Unplanned Readmission following Psychiatric Hospitalization in an Inpatient Psychiatric Facility (IPF)

NQF Endorsement Status	Endorsed
NQF ID	2860
Measure Type	Outcome
Measure Content Last Updated	2019-01-05
Info As Of	Not Available

Properties

Description	This facility-level measure estimates an unplanned, 30-day, risk-standardized readmission rate for adult Medicare fee-for-service (FFS) patients with a principal discharge diagnosis of a psychiatric disorder or dementia/Alzheimer s disease. The performance period used to identify cases in the denominator is 24 months. Data from 12 months prior to the start of the performance period through the performance period are used to identify risk factors.
Numerator	The risk-adjusted outcome measure does not have a traditional numerator and denominator. Here we describe the outcome being measured. A readmission is defined as any admission, for any reason, to an IPF or a short-stay acute care hospital (including Critical Access Hospitals) that occurs within 30 days after the discharge date from an eligible index admission to an IPF, except those considered planned. The measure uses the CMS 30-day HWR Measure Planned Readmission Algorithm, Version 4.0.
Denominator	The risk-adjusted outcome measure does not have a traditional numerator and denominator. Here we describe the target population for measurement. The target population for this measure is adult Medicare FFS beneficiaries discharged from an IPF. The measure is based on all eligible index admissions from the target population. A readmission within 30-days will also be eligible as an index admission, if it meets all other eligibility criteria. Patients may have more than one index admission within the measurement period. The denominator includes admissions to IPFs for patients: Age 18 or older at admission

Thirty-Day All-Cause Unplanned Readmission following Psychiatric Hospitalization in an Inpatient Psychiatric Facility (IPF)

	Discharged alive Enrolled in Medicare FFS Parts A and B during the 12 months before the admission date, month of admission, and at least one month after the month of discharge from the index admission Discharged with a principal diagnosis of psychiatric illness included in one of the Agency for Healthcare Research and Quality (AHRQ) Clinical Classification Software (CCS) ICD-9 and ICD-10 groupings
Denominator Exclusions	The denominator excludes admissions for patients: 1. Discharged against medical advice (AMA) because the IPF may have limited opportunity to complete treatment and prepare for discharge. 2. With unreliable demographic and vital status data defined as: o Age greater than 115 years o Missing gender o Discharge status of dead but with subsequent admissions o Death date prior to admission date o Death date within the admission and discharge dates for an admission but the discharge status was not dead 3. With readmissions on the day of discharge or day following discharge because those readmissions are likely transfers to another inpatient facility. The hospital that discharges the patient to home or a non-acute care setting is accountable for subsequent readmissions. 4. With readmissions two days following discharge because readmissions to the same IPF within two days of discharge are combined into the same claim as the index admission and do not appear as readmissions due to the interrupted stay billing policy. Therefore, complete data on readmissions within two days of discharge are not available.
Rationale	Benefits have been seen in other sectors of care that have a readmission performance measure. The 30-day readmission rate for acute care hospitals held at a constant rate of 19% between 2007 and 2011. After the Hospital Readmissions Reduction Program began in 2012, readmission rates fell to 18.5%, and recent data suggest that these rates continue to decline. This decrease translates to 130,000 fewer hospital readmissions over an eight-month period (Centers for Medicare & Medicaid Services, 2013). Moreover, because readmission is an outcome measure that is influenced by multiple

Thirty-Day All-Cause Unplanned Readmission following Psychiatric Hospitalization in an Inpatient Psychiatric Facility (IPF)

	care processes and structures, as well as the entire healthcare team, it promotes a systems approach to improvement and providing care. A readmission measure promotes shared accountability and collaboration with patients, families, and providers in other settings of care.
Evidence	Not Available

Developer/Steward

Steward	Centers for Medicare & Medicaid Services (CMS)
Contact	Not Available
Measure Developer	Health Services Advisory Group (HSAG)
Development Stage	Fully Developed

Characteristics

Measure Type	Outcome
Meaningful Measure Area	Admissions and Readmissions to Hospitals
Healthcare Priority	Promote Effective Communication & Coordination of Care
eCQM Spec Available	No
NQF Endorsement Status	Endorsed
NQF ID	2860
Last NQF Update	2017-12-22
Target Population Age	18+
Target Population Age (High)	Not Available

Thirty-Day All-Cause Unplanned Readmission following Psychiatric Hospitalization in an Inpatient Psychiatric Facility (IPF)

Target Population Age (Low)	18
Reporting Level	Facility
Conditions	Not Available
Subconditions	Not Available
Care Settings	IPF

Groups

Core Measure Set	Not Available

Measure Links

Measure Program: Inpatient Psychiatric Facility Quality Reporting

Info As Of	Not Available
Data Sources	Claims; Administrative Claims
Purposes	Not Available
Quality Domain	Not Available

Measure Program Links

Thirty-Day All-Cause Unplanned Readmission following Psychiatric Hospitalization in an Inpatient Psychiatric Facility (IPF)

Current Measure Status

Status: Implemented

Effective Date	2018-10-01
Comments	Not Available
Status Links	https://www.gpo.gov/fdsys/pkg/FR-2016-08-22/pdf/2016-18476.pdf

Historical Statuses

Status: Finalized

Effective Date	2016-08-22	
Comments	Not Available	
Status Links	https://www.gpo.gov/fdsys/pkg/FR-2016-08-22/pdf/2016-18476.pdf	
Other Data	**Name**	**Value**
	MUC ID	MUC15-1082
	MUC Year	2015

Status: Proposed

Effective Date	2016-04-27
Comments	Not Available
Status Links	https://www.gpo.gov/fdsys/pkg/FR-2016-04-27/pdf/2016-09120.pdf

Status: Considered

Effective Date	2015-12-01

Thirty-Day All-Cause Unplanned Readmission following Psychiatric Hospitalization in an Inpatient Psychiatric Facility (IPF)

Comments	Not Available

Status: Reference

Effective Date	1900-01-01
Comments	Not Available
Status Links	https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/CallforPublicComment.html#17 https://www.gpo.gov/fdsys/pkg/FR-2016-08-22/pdf/2016-18476.pdf

Psychiatric Inpatient Readmissions – Medicaid (PCR-P)

Description

For members 18 years of age and older, the proportion of acute inpatient psychiatric stays during the measurement year that were followed by an acute psychiatric readmission within 30 days. Data are reported in the following categories:

1. Count of Index Hospital Stays (IHS) (denominator).
2. Count of 30-Day Readmissions (numerator).

Note: *Only members 18–64 years of age are reported.*

Definitions

IHS	Index hospital stay. An acute psychiatric inpatient stay with a discharge on or between January 1 and December 1 of the measurement year. Include stays that meet the inclusion criteria in the denominator section. A client may have multiple qualifying discharges in the measurement period.
Index Admission Date	The IHS admission date.
Index Discharge Date	The IHS discharge date. The index discharge date must occur on or between January 1 and December 1 of the measurement year.
Index Readmission Stay	An acute psychiatric inpatient stay with an admission date within 30 days of a previous Index Discharge Date.
Index Readmission Date	The admission date associated with the Index Readmission Stay.
Classification Period	365 days prior to and including an Index Discharge Date.

Eligible Population

Ages	Age 18-64 as of the Index Discharge Date
Continuous enrollment	365 days prior to the Index Discharge Date through 30 days after the Index Discharge Date.
Allowable gap	No more than one gap in enrollment of up one month during the 365 days prior to the Index Discharge Date and no gap during the 30 days following the Index Discharge date.
Anchor date	Index Discharge Date.
Event/ diagnosis	An acute inpatient discharge on or between January 1 and December 1 of the measurement year. The denominator for this measure is based on discharges, not members. Include all acute inpatient discharges for members who had one or more discharges on or between January 1 and December 1 of the measurement year.

Use the steps below to identify acute inpatient psychiatric stays.

Administrative Specification

Denominator The eligible population.

Step 1 Identify all acute inpatient psychiatric stays with a discharge date on or between January 1 and December 1 of the measurement year.

Include only acute admissions to behavioral healthcare facilities, as identified in Table 1 below.

Step 2 ***Acute-to–acute transfers:*** Keep the original admission date as the Index Admission Date, but use the transfer's discharge date as the Index Discharge Date.

Step 3 Exclude hospital stays where the Index Admission Date is the same as the Index Discharge Date.

Step 4 Exclude stays with discharges for death from the observation set.

Step 5 Calculate continuous enrollment and determine whether the observation meets continuous enrollment criteria.

Table 1. Eligible Acute Inpatient Psychiatric Events

Event	Source
Community Psychiatric Hospital Admissions	ProviderOne
Evaluation & Treatment Center Admissions	ProviderOne, supplemented by DBHR Consumer Information System
Child Long-Term Inpatient Admissions	DBHR Consumer Information System
Child Study Treatment Center Admissions	DBHR Consumer Information System
Eastern and Western State Hospital Admissions	DBHR Consumer Information System

Numerator At least one acute readmission for any diagnosis within 30 days of the Index Discharge Date from the facilities identified in Table 1.

Quality ID #383 (NQF 1879): Adherence to Antipsychotic Medications For Individuals with Schizophrenia
– National Quality Strategy Domain: Patient Safety
– Meaningful Measure Area: Prevention, Treatment, and Management of Mental Health

2019 COLLECTION TYPE:
MIPS CLINICAL QUALITY MEASURES (CQMS)

MEASURE TYPE:
Intermediate Outcome – High Priority

DESCRIPTION:
Percentage of individuals at least 18 years of age as of the beginning of the measurement period with schizophrenia or schizoaffective disorder who had at least two prescriptions filled for any antipsychotic medication and who had a Proportion of Days Covered (PDC) of at least 0.8 for antipsychotic medications during the measurement period (12 consecutive months)

INSTRUCTIONS:
This measure is to be submitted a minimum of **once per performance period** for all patients with a diagnosis of schizophrenia or schizoaffective disorder seen during the performance period. This measure may be submitted by Merit-based Incentive Payment System (MIPS) eligible clinicians who perform the quality actions described in the measure for the primary management of patients with schizophrenia or schizoaffective disorder based on the services provided and the measure-specific denominator coding.

Measure Submission Type:
Measure data may be submitted by individual MIPS eligible clinicians, groups, or third party intermediaries. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure. The quality-data codes listed do not need to be submitted by MIPS eligible clinicians, groups, or third party intermediaries that utilize this modality for submissions; however, these codes may be submitted for those third party intermediaries that utilize Medicare Part B claims data. For more information regarding Application Programming Interface (API), please refer to the Quality Payment Program (QPP) website.

DENOMINATOR:
Individuals at least 18 years of age as of the beginning of the measurement period with schizophrenia or schizoaffective disorder and at least two prescriptions filled for antipsychotic medications during the measurement period (12 consecutive months)

DENOMINATOR NOTE: *The following are the oral antipsychotic medications by class for the denominator. The route of administration includes all oral formulations of the medications listed below.*

TYPICAL ANTIPSYCHOTIC MEDICATIONS:

- chlorpromazine
- fluphenazine
- haloperidol
- loxapine
- molindone
- perphenazine
- prochlorperazine
- thioridazine
- thiothixene
- trifluoperazine

ATYPICAL ANTIPSYCHOTIC MEDICATIONS:

- aripiprazole

- asenapine
- brexpiprazole
- cariprazine
- clozapine
- olanzapine
- iloperidone
- lurasidone
- paliperidone
- quetiapine
- quetiapine fumarate (Seroquel)
- risperidone
- ziprasidone

ANTIPSYCHOTIC COMBINATIONS:
- perphenazine-amitriptyline

LONG-ACTING INJECTABLE ANTIPSYCHOTIC MEDICATIONS:
NOTE: *The following are the long-acting (depot) injectable antipsychotic medications by class for the denominator. The route of administration includes all injectable and intramuscular formulations of the medications listed below.*

TYPICAL ANTIPSYCHOTIC MEDICATIONS:
- fluphenazine decanoate (J2680)
- haloperidol decanoate (J1631)

ATYPICAL ANTIPSYCHOTIC MEDICATIONS:
- aripiprazole (J0401)
- aripiprazole lauroxil (Aristada)
- olanzapine pamoate (J2358)
- paliperidone palmitate (J2426)
- risperidone microspheres (J2794)

NOTE: *Since the days' supply variable is not reliable for long-acting injections in administrative data, the days' supply is imputed as listed below for the long-acting (depot) injectable antipsychotic medications billed under Part D and Part B:*

- aripiprazole (J0401) – 28 days' supply
- aripiprazole lauroxil (Aristada) – 28 days' supply
- fluphenazine decanoate (J2680) – 28 days' supply
- haloperidol decanoate (J1631) – 28 days' supply
- olanzapine pamoate (J2358) – 28 days' supply
- paliperidone palmitate (J2426) – 28 days' supply
- risperidone microspheres (J2794) – 14 days' supply

**Signifies that this CPT Category I code is a non-covered service under the Medicare Part B Physician Fee Schedule (PFS). These non-covered services should be counted in the denominator population for MIPS CQMs.*

Denominator Criteria (Eligible Cases):
Patients aged ≥ 18 years at the beginning of the measurement period
AND
Diagnosis for schizophrenia or schizoaffective disorder (ICD-10-CM): F20.0, F20.1, F20.2, F20.3, F20.5, F20.81, F20.89, F20.9, F25.0, F25.1, F25.8, F25.9

AND

At least two encounters with a diagnosis of schizophrenia or schizoaffective disorder (see code set below) with different dates of service in an outpatient setting, emergency department setting, or non-acute inpatient setting during the measurement period**

OR

At least one encounter with a diagnosis of schizophrenia or schizoaffective disorder (see code set below) in an acute inpatient setting during the measurement period**

AND

****Patient encounter during the performance period determination Outpatient Setting Option 1 (CPT or HCPCS):** 98960, 98961, 98962, 99078, 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99217, 99218, 99219, 99220,99241, 99242, 99243, 99244, 99245, 99281, 99282, 99283, 99284, 99285, 99304, 99305, 99306, 99307, 99308, 99309, 99310, 99315, 99316, 99318, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350,99385, 99386, 99387, 99395, 99396, 99397, 99401, 99402, 99403, 99404, 99411, 99412, 99429, 99510, G0155*, G0176*, G0177*, G0409, G0410*, G0411*, G0463*, H0002*, H0004*, H0031*, H0034*, H0035*, H0036*, H0037*, H0039*, H0040*, H2000*, H2001*, H2010*, H2011*, H2012*, H2013*, H2014*, H2015*, H2016*, H2017*, H2018*, H2019*, H2020*, M0064, S0201*, S9480*, S9484*, S9485*, T1015*

OR

Outpatient Setting Option 2 (CPT): 90791, 90792, 90832, 90833, 90834, 90836, 90837, 90838, 90839, 90840, 90845, 90847, 90849, 90853, 90863*, 90867, 90868, 90869, 90870, 90875*, 90876*, 90880, 99221, 99222, 99223, 99231, 99232, 99233, 99238, 99239, 99251*, 99252*, 99253*, 99254*, 99255*, 99291

WITH

Place of Service (POS): 03, 05, 07, 09, 11, 12, 13, 14, 15, 20, 22, 24, 33, 49, 50, 52, 53, 71, 72

OR

Emergency Department Setting Option 1 (CPT): 99281, 99282, 99283, 99284, 99285

OR

Emergency Department Setting Option 2 (CPT): 90791, 90792, 90832, 90833, 90834, 90836, 90837, 90838, 90839, 90840, 90845, 90847, 90849, 90853, 90863*, 90867, 90868, 90869, 90870, 90875*, 90876*, 99291

WITH

Place of Service (POS): 23

OR

Non-Acute Inpatient Setting Option 1 (CPT): 99304, 99305, 99306, 99307, 99308, 99309, 99310, 99315, 99316, 99318, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337

Non-Acute Inpatient Setting Option 1 (HCPCS): H0017, H0018, H0019, T2048

OR

Non-Acute Inpatient Setting Option 2 (CPT): 90791, 90792, 90832, 90833, 90834, 90836, 90837, 90838, 90839, 90840, 90845, 90847, 90849, 90853, 90863*, 90867, 90868, 90869, 90870, 90875*, 90876*, 99291

WITH

Place of Service (POS): 31, 32, 56

OR

Acute Inpatient Setting (CPT): 90791, 90792, 90832, 90833, 90834, 90836, 90837, 90838, 90839, 90840, 90845, 90847, 90849, 90853, 90863*, 90867, 90868, 90869, 90870, 90875*, 90876*, 99221, 99222, 99223, 99231, 99232, 99233, 99238, 99239, 99251*, 99252*, 99253*, 99254*, 99255*, 99291

WITH

Place of Service (POS): 21, 51
AND NOT
DENOMINATOR EXCLUSION:
Diagnosis for dementia (ICD-10-CM): E75.00, E75.01, E75.02, E75.09, E75.10, E75.11, E75.19, E75.4, F01.50, F01.51, F02.80, F02.81, F03.90, F03.91, F05, F10.27, F13.27, F13.97, F18.17, F18.27, F18.97, F19.17, F19.27, F19.97, G30.0, G30.1, G30.8, G30.9, G31.09, G31.83

NUMERATOR:
Individuals in the denominator who have a Proportion of Days Covered (PDC) of at least 0.8 for antipsychotic medications

NUMERATOR NOTE: *The PDC is calculated as follows:*

PDC NUMERATOR:
The PDC numerator is the sum of the days covered by the days' supply of all antipsychotic prescriptions. The period covered by the PDC starts on the day the first prescription is filled (index date) and lasts through the end of the measurement period, or death, whichever comes first. For prescriptions with a days' supply that extends beyond the end of the measurement period, count only the days for which the drug was available to the individual during the measurement period. If there are prescriptions for the same drug (generic name) on the same date of service, keep the prescription with the largest days' supply. If prescriptions for the same drug (generic name) overlap, then adjust the prescription start date to be the day after the previous fill has ended.

PDC DENOMINATOR:
The PDC denominator is the number of days from the first prescription date through the end of the measurement period, or death date, whichever comes first.

Numerator Options:
Performance Met: Individual had a PDC of 0.8 or greater **(G9512)**

OR

Performance Not Met: Individual did not have a PDC of 0.8 or greater **(G9513)**

RATIONALE:
A large body of evidence has shown that antipsychotic medications are effective in treating acute psychotic exacerbations of schizophrenia and in reducing the likelihood of relapse. Guidelines from the National Institute for Clinical Excellence (NICE) and American Psychiatric Association (APA) emphasize the importance of treatment adherence and uninterrupted antipsychotic regimens to prevent symptoms and relapse (National Collaborating Centre for Mental Health 2014; Lehman et al. 2004). This measure will describe the degree of compliance or non-compliance with these recommendations. By providing information on the percentage of schizophrenic individuals with appropriate long-term use of antipsychotic medications, this measure has the potential to improve management of schizophrenia.

This measure addresses a Health People 2020 goal to increase the proportion of adults with serious mental illness who receive treatment (ODPHP, 2018).

Although the prevalence of schizophrenia in the adult American population is less than 1% (Kessler et al. 2005), this population has a higher risk of premature mortality than the general population. The estimated average potential life lost is 28.5 years for individuals with schizophrenia compared to the general population (Olfson et al. 2015). The overall U.S. cost of schizophrenia has been estimated at $155.7 billion annually with direct health care costs of $37.7 billion (Cloutier et al., 2016). Antipsychotic medications have proven to be effective in treating this disease, and this measure will help to capture the extent of utilization of this treatment.

References:

Cloutier M, Aigbogun MS, Guerin A, Nitulescu R, Ramanakumar AV, Kamat SA, DeLucia M, Duffy R, Legacy SN, Henderson C, Francois C, and Wu E. The economic burden of schizophrenia in the United States in 2013. *The Journal of Clinical Psychiatry*. 2016; 77(6): 764-71.

Kessler RC, Birnbaum H, Demler O, Falloon IRH, Gagnoon E, Guyer M, Howes MJ, Kendler KS, Shi L, Walters E, and Wu EQ. The prevalence and correlates of non-affective psychosis in the National Comorbidity Survey Replication (NCS-R). *Biol Psychiatry*. 2005; 58(8): 668-76.

Lehman AF, Lieberman JA., Dixon LB, McGlashan TH, Miller AL, Perkins DO, and Kreyenbuhl J. (2004). Practice guidelines for the treatment of patients with schizophrenia. *American Psychiatric Association*. Retrieved from https://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/schizophrenia.pdf

The National Institute for Clinical Excellence and the National Collaborating Centre for Mental health. Psychosis and schizophrenia in adults: prevention and management. 2014; National Clinical Guideline Number 178: 301-379. Retrieved from https://www.nice.org.uk/guidance/cg178/evidence/full-guideline-pdf-490503565

Office of Disease Prevention and Health Promotion (ODPHP). Health People 2020: Mental Health and Mental Disorders.2018; Health People 2020. Retrieved from https://www.healthypeople.gov/2020/topics-objectives/topic/mental-health-and-mental-disorders/objectives.

Olfson M, Gerhard T, Huang C, Crystal S, and Stroup TS. Premature mortality among adults with schizophrenia in the United States. *JAMA Psychiatry*. 2015; 72(12): 1172-81.

CLINICAL RECOMMENDATION STATEMENTS:

The 2014 NICE Guideline on Treatment and Management of Psychosis and Schizophrenia in Adults recommends that "for people with an acute exacerbation or recurrence of psychosis or schizophrenia, offer oral antipsychotic medication in conjunction with psychological interventions (family intervention and individual [cognitive behavioral therapy])". The guideline also recommends to "consider offering depot /long-acting injectable antipsychotic medication to people with psychosis or schizophrenia who would prefer such treatment after an acute episode [or] where avoiding covert non-adherence (either intentional or unintentional) to antipsychotic medication is a clinical priority within the treatment plan" (National Collaborating Centre for Mental Health 2014). These recommendations are found on pages 381 and 382 of the 2014 NICE Guideline under the Clinical Practice Recommendations, Treatment of Acute Episode and Promoting Recovery sections, respectively.

References:

The National Institute for Clinical Excellence and the National Collaborating Centre for Mental health. Psychosis and schizophrenia in adults: prevention and management. 2014; National Clinical Guideline Number 178: 301-379. Retrieved from https://www.nice.org.uk/guidance/cg178/evidence/full-guideline-pdf-490503565

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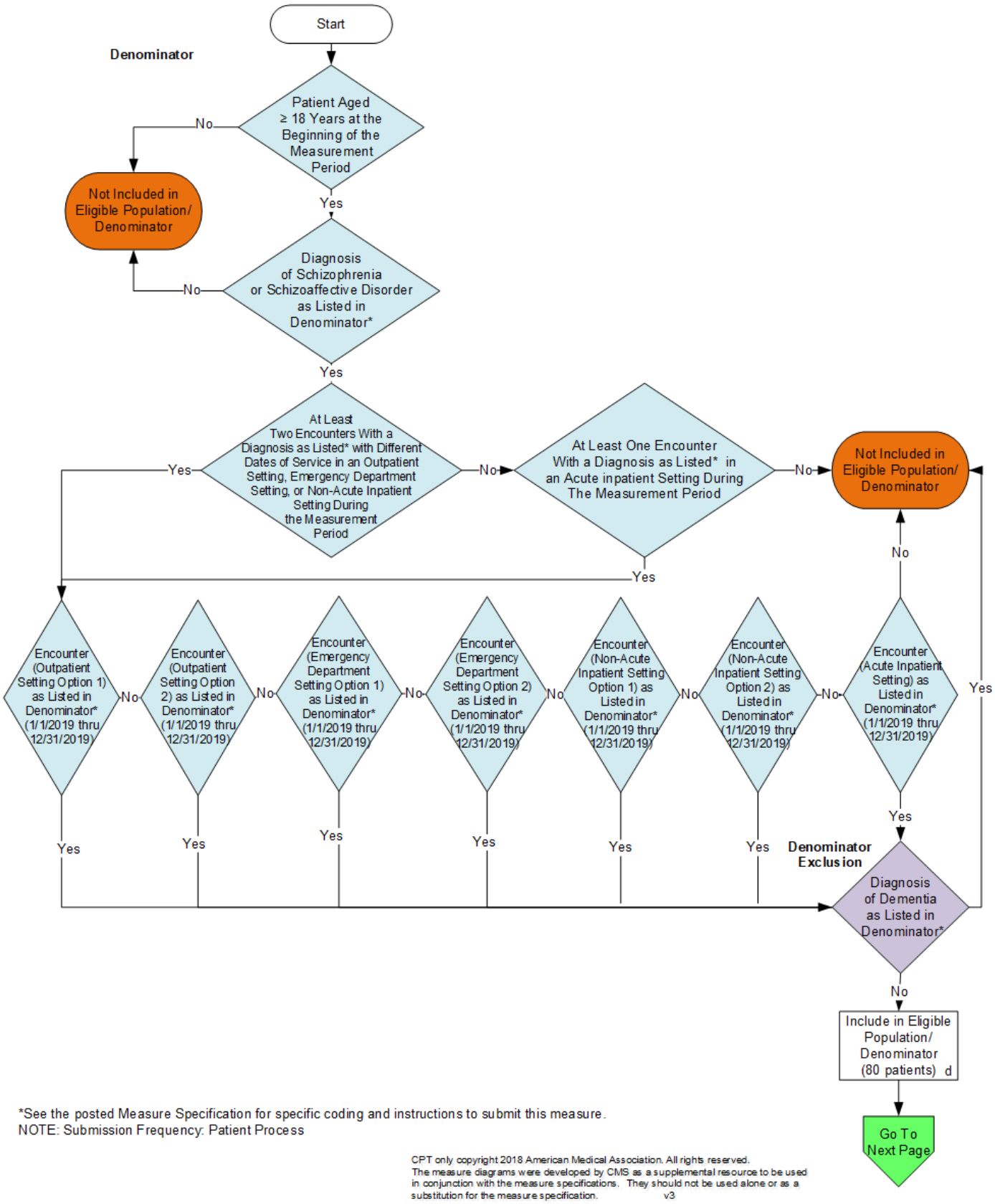
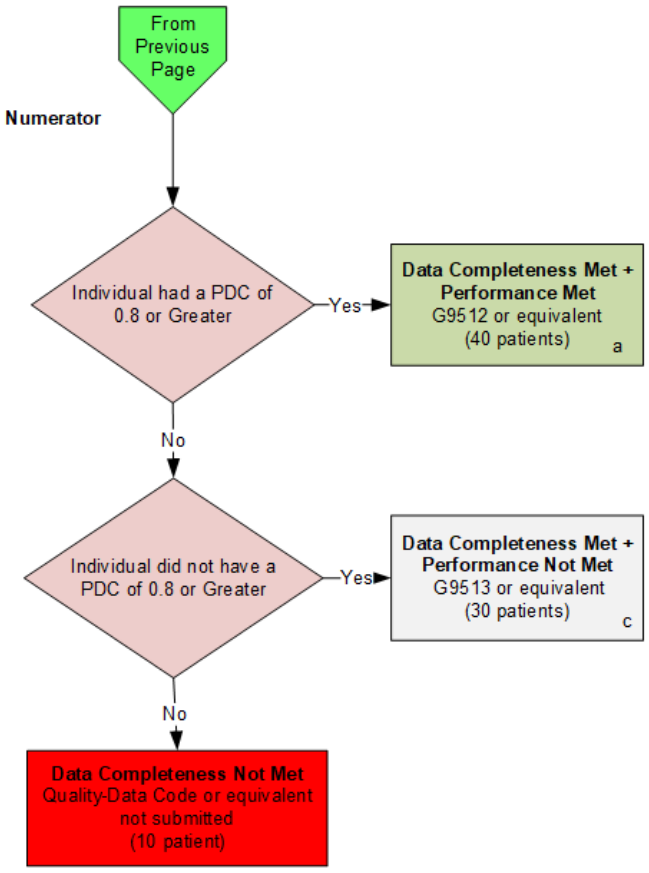
2019 Clinical Quality Measure Flow for Quality ID #383 NQF #1879: Adherence to Antipsychotic Medications for Individuals with Schizophrenia



*See the posted Measure Specification for specific coding and instructions to submit this measure.
NOTE: Submission Frequency: Patient Process

2019 Clinical Quality Measure Flow For Quality ID #383 NQF #1879: Adherence to Antipsychotic Medications for Individuals with Schizophrenia



SAMPLE CALCULATIONS:

Data Completeness=
Performance Met (a=40 patients) + Performance Not Met (c=30 patients) = 70 patients = **87.50%**
Eligible Population / Denominator (d=80 patients) = 80 patients

Performance Rate=
Performance Met (a=40 patients) = 40 patients = **57.14%**
Data Completeness Numerator (70 patients) = 70 patients

*See the posted Measure Specification for specific coding and instructions to submit this measure.
NOTE: Submission Frequency: Patient Process

2019 Clinical Quality Measure Flow Narrative for Quality ID #383 NQF #1879: Adherence to Antipsychotic Medications for Individuals with Schizophrenia

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specification.

1. Start with Denominator
2. Check Patient Age:
    a. If Patient Age is greater than or equal to 18 Years at the Beginning of the Measurement Year equals No, do not include in Eligible Population. Stop Processing.
    b. If Patient Age is greater than or equal to 18 Years at the Beginning of the Measurement Year equals Yes, proceed to check Patient Diagnosis.
3. Check Patient Diagnosis:
    a. If Diagnosis of Schizophrenia or Schizoaffective Disorder as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.
    b. If Diagnosis of Schizophrenia or Schizoaffective Disorder as Listed in the Denominator equals Yes, proceed to check At Least Two Encounters With a Diagnosis.
4. Check At Least Two Encounters with a Diagnosis:
    a. If At Least Two Encounters with a Diagnosis as Referenced Above with Different Dates of Service in an Outpatient Setting, Emergency Department Setting, or Non-Acute Inpatient Setting During the Measurement Period equals No, proceed to check At Least One Encounter with Diagnosis.
    b. If At Least Two Encounters with a Diagnosis as Referenced Above with Different Dates of Service in an Outpatient Setting, Emergency Department Setting, or Non-Acute Inpatient Setting During the Measurement Period equals Yes, proceed to check Encounter Performed Outpatient Setting Option 1.
5. Check At Least One Encounter with Diagnosis:
    a. If At Least One Encounter with a Diagnosis as Referenced Above in an Acute Inpatient Setting During the Measurement Period with Diagnosis equals No, do not include in Eligible Population. Stop Processing.
    b. If At Least One Encounter with a Diagnosis as Referenced Above in an Acute Inpatient Setting During the Measurement Period with Diagnosis equals Yes, proceed to check Outpatient Setting Option 1.
6. Check Outpatient Setting Option 1:
    a. If Outpatient Setting Option 1 Encounter as Listed in the Denominator equals No, proceed to check Outpatient Setting Option 2.
    b. If Outpatient Setting Option 1 Encounter as Listed in the Denominator equals Yes, proceed to check Patient Diagnosis.
7. Check Outpatient Setting Option 2:
    a. If Outpatient Setting Option 2 Encounter as Listed in the Denominator equals No, proceed to check Emergency Department Setting Option 1.
    b. If Outpatient Setting Option 2 Encounter as Listed in the Denominator equals Yes, proceed to check Patient Diagnosis.

8. Check Emergency Department Setting Option 1:
    a. If Emergency Department Setting Option 1 Encounter as Listed in the Denominator equals No, proceed to check Emergency Department Setting Option 2.
    b. If Emergency Department Setting Option 1 Encounter as Listed in the Denominator equals Yes, proceed to check Patient Diagnosis.
9. Check Emergency Department Setting Option 2:
    a. If Emergency Department Setting Option 2 Encounter as Listed in the Denominator equals No, proceed to check Non-Acute Inpatient Setting Option 1.
    b. If Emergency Department Setting Option 1 Encounter as Listed in the Denominator equals Yes, proceed to check Patient Diagnosis.
10. Check Non-Acute Inpatient Setting Option 1
    a. If Non-Acute Inpatient Setting Option 1 Encounter as Listed in the Denominator equals No, proceed to check Non-Acute Inpatient Option 2 Encounter.
    b. If Non-Acute Inpatient Setting Option 1 Encounter as Listed in the Denominator equals Yes, proceed to check Patient Diagnosis.
11. Check Non-Acute Inpatient Setting Option 2:
    a. If Non-Acute Inpatient Setting Option 2 Encounter as Listed in the Denominator equals No, proceed to check Acute Inpatient Encounter.
    b. If Non-Acute Inpatient Setting Option 2 Encounter as Listed in the Denominator equals Yes, proceed to check Patient Diagnosis.
12. Check Acute Inpatient Setting:
    a. If Acute Inpatient Setting Encounter as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.
    b. If Acute Inpatient Setting Encounter as Listed in the Denominator equals Yes, proceed to check Patient Diagnosis.
13. Check Patient Diagnosis:
    a. If Diagnosis of Dementia as Listed in the Denominator equals Yes, do not include in Eligible Population. Stop Processing.
    b. If Diagnosis of Dementia as Listed in the Denominator equals No, include in Eligible Population.
14. Eligible Population:
    a. Eligible Population is All Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 80 patients in the Sample Calculation.
15. Start Numerator
16. Check Individual had a PDC of 0.8 or Greater:
    a. If Individual had a PDC of 0.8 or Greater equals Yes, include in Data Completeness Met and Performance Met.

b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a equals 40 patients in Sample Calculation.

c. If Individual had a PDC of 0.8 or Greater equals No, proceed to check Individual did not have a PDC of 0.8 or Greater.

17. Check Individual did not have a PDC of 0.8 or Greater:

a. If Individual did not have a PDC of 0.8 or Greater equals Yes, include in Data Completeness Met and Performance Not Met.

b. Data Completeness Met and Performance Not Met letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 30 patients in the Sample Calculation.

c. If Individual did not have a PDC of 0.8 or Greater equals No, proceed to check Data Completeness Not Met.

18. Check Data Completeness Not Met:

a. If Data Completeness Not Met, the Quality Data Code or equivalent was not submitted. 10 patients have been subtracted from the Data Completeness Numerator in Sample Calculation.

SAMPLE CALCULATIONS:

Data Completeness=

Performance Met (a=40 patients) + Performance Not Met (c=30 patients) = 70 patients = **87.50%**

Eligible Population / Denominator (d=80 patients) = 80 patients

Performance Rate=

Performance Met (a=40 patients) = 40 patients = **57.14%**

Data Completeness Numerator (70 patients) = 70 patients

Adolescent Well-Care Visits (AWC)

SUMMARY OF CHANGES TO HEDIS 2020

- Added instructions to not count services provided via telehealth when reporting this measure.
- Added a *Note* to clarify that handouts given during a visit without evidence of a discussion does not meet criteria for Health Education/Anticipatory Guidance.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of enrolled members 12–21 years of age who had at least one comprehensive well-care visit with a PCP or an OB/GYN practitioner during the measurement year.

Note

- *This measure has the same structure as measures in the Effectiveness of Care domain. The organization must follow the Guidelines for Effectiveness of Care Measures when calculating this measure.*
- *Only the Administrative Method of data collection may be used when reporting this measure for the commercial population.*

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure for the Medicaid product line using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicaid (report each product line separately).
Ages	12–21 years as of December 31 of the measurement year.
Continuous enrollment	The measurement year.
Allowable gap	Members who have had no more than one gap in enrollment of up to 45 days during the measurement year. To determine continuous enrollment for a Medicaid member for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
Anchor date	December 31 of the measurement year.
Benefit	Medical.
Event/diagnosis	None.

Administrative Specification

Denominator The eligible population.

Numerator At least one comprehensive well-care visit (Well-Care Value Set) with a PCP or an OB/GYN practitioner during the measurement year. The practitioner does not have to be the practitioner assigned to the member.

Do not count visits billed with a telehealth modifier (Telehealth Modifier Value Set) or billed with a telehealth POS code (Telehealth POS Value Set).

Hybrid Specification

Denominator A systematic sample drawn from the eligible population for the Medicaid product line. Organizations may reduce the sample size using the current year's administrative rate or the prior year's audited rate.

Refer to *Guidelines for Calculations and Sampling* for information on reducing sample size.

Numerator At least one comprehensive well-care visit with a PCP or an OB/GYN practitioner during the measurement year, as documented through either administrative data or medical record review. The PCP does not have to be assigned to the member.

Administrative Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record Documentation in the medical record must include a note indicating a visit to a PCP or OB/GYN practitioner, the date when the well-care visit occurred and evidence of *all* of the following:

- **A health history.** Health history is an assessment of the member's history of disease or illness. Health history can include, but is not limited to, past illness (or lack of illness), surgery or hospitalization (or lack of surgery or hospitalization) and family health history.
- **A physical developmental history.** Physical developmental history includes developmental milestones and assessment of whether the adolescent is developing skills to become a healthy adult.
- **A mental developmental history.** Mental developmental history includes developmental milestones and assessment of whether the adolescent is developing skills to become a healthy adult.
- **A physical exam.**
- **Health education/anticipatory guidance.** Health education/anticipatory guidance is given by the health care provider to the member and/or parents or guardians in anticipation of emerging issues that a member and family may face.

Do not include services rendered via telehealth or during an inpatient or ED visit.

Preventive services may be rendered on visits other than well-child visits. Well-child preventive services count toward the measure, regardless of the primary intent of the visit, but services that are specific to the assessment or treatment of an acute or chronic condition do not count toward the measure.

Visits to school-based clinics with practitioners whom the organization would consider PCPs may be counted if documentation that a well-care exam occurred is available in the medical record or administrative system in the time frame specified by the measure. The PCP does not have to be assigned to the member.

The organization may count services that occur over multiple visits, as long as all services occur in the time frame specified by the measure.

Note

- *The following notations or examples of documentation do not count as numerator compliant:*
  - ***Health History***
    - *Notation of allergies or medications or immunization status alone. If all three (allergies, medications, immunization status) are documented it meets criteria.*
  - ***Physical Developmental History***
    - *Notation of "appropriate for age" without specific mention of development.*
    - *Notation of "well-developed/nourished/appearing."*

    Note: *Documentation of "Tanner Stage/Scale" meets criteria for Physical Developmental History for this measure.*
  - ***Mental Developmental History***
    - *Notation of "appropriately responsive for age."*
    - *Notation of "neurological exam."*
    - *Notation of "well-developed."*
  - ***Physical Exam***
    - *Vital signs alone.*
    - *Visits where care is limited to OB/GYN topics (e.g., prenatal or postpartum care). The purpose of including visits with OB/GYNs is to allow that practitioner type to perform the adolescent well-care visit requirements. It is not the measure's intent to allow care limited to OB/GYN topics to be a substitute for well-care.*
  - ***Health Education/Anticipatory Guidance***
    - *Information regarding medications or immunizations or their side effects.*
    - *"Handouts given" during the visit without evidence of a discussion.*
- *Refer to Appendix 3 for the definition of* PCP *and* OB/GYN *and* other prenatal care practitioners.
- *This measure is based on the CMS and American Academy of Pediatrics guidelines for EPSDT visits. Refer to the American Academy of Pediatrics Guidelines for Health Supervision at www.aap.org and Bright Futures: Guidelines for Health Supervision of Infants, Children and Adolescents (published by the National Center for Education in Maternal and Child Health) at www.Brightfutures.org for more information about well-care visits.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table AWC-1/2: Data Elements for Adolescent Well-Care Visits

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		✓
Current year's administrative rate (before exclusions)		✓
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		✓
Administrative rate on MRSS		✓
Number of medical records excluded because of valid data errors		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	✓	✓
Numerator events by medical records		✓
Numerator events by supplemental data	✓	✓
Reported rate	✓	✓

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Adolescent Well-Care Visits

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes	The age determination dates may be changed (e.g., select, "age as of June 30"). Changing the denominator age range is allowed.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Using a benefit is not required; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	NA	There is no event/diagnosis for this measure.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Exclusions	NA	There are no exclusions for this measure.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Well-Child Visit(s)	No	Value sets and logic may not be changed.

Adult BMI Assessment (ABA)

SUMMARY OF CHANGES TO HEDIS 2020

- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 18–74 years of age who had an outpatient visit and whose body mass index (BMI) was documented during the measurement year or the year prior to the measurement year.

Definitions

BMI	Body mass index. A statistical measure of the weight of a person scaled according to height.
BMI percentile	The percentile ranking based on the Centers for Disease Control and Prevention's (CDC) BMI-for-age growth charts, which indicate the relative position of a patient's BMI number among those of the same sex and age.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicaid, Medicare (report each product line separately).
Ages	18 years as of January 1 of the year prior to the measurement year to 74 years as of December 31 of the measurement year.
Continuous enrollment	The measurement year and the year prior to the measurement year.
Allowable gap	No more than one gap in continuous enrollment of up to 45 days during each year of continuous enrollment. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
Anchor date	December 31 of the measurement year.
Benefit	Medical.
Event/diagnosis	Members who had an outpatient visit (Outpatient Value Set) during the measurement year or the year prior to the measurement year.

Administrative Specification

Denominator The eligible population.

Numerator For members 20 years of age or older on the date of service, BMI (BMI Value Set) during the measurement year or the year prior to the measurement year.

For members younger than 20 years of age on the date of service, BMI percentile (BMI Percentile Value Set) during the measurement year or the year prior to the measurement year.

Exclusions *(optional)*

Female members who have a diagnosis of pregnancy (Pregnancy Value Set) during the measurement year or the year prior to the measurement year.

Hybrid Specification

Denominator A systematic sample drawn from the eligible population. The organization may reduce the sample size using the current year's administrative rate or the prior year's audited, product line-specific rate. Refer to the *Guidelines for Calculations and Sampling* for information on reducing the sample size.

Numerator BMI during the measurement year or the year prior to the measurement year as documented through either administrative data or medical record review.

Administrative Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record For members 20 years and older on the date of service, documentation in the medical record must indicate the weight and BMI value, dated during the measurement year or year prior to the measurement year. The weight and BMI value must be from the same data source.

For members younger than 20 years on the date of service, documentation in the medical record must indicate the height, weight and BMI percentile, dated during the measurement year or year prior to the measurement year. The height, weight and BMI percentile must be from the same data source.

For BMI percentile, either of the following meets criteria:

- BMI percentile documented as a value (e.g., 85th percentile).
- BMI percentile plotted on an age-growth chart.

Ranges and thresholds do not meet criteria for this indicator. A distinct BMI value or percentile, if applicable, is required for numerator compliance. Documentation of >99% or <1% meet criteria because a distinct BMI percentile is evident (i.e., 100% or 0%).

Exclusions *(optional)*

Refer to *Administrative Specification* for exclusion criteria. Exclusionary evidence in the medical record must include a note indicating a diagnosis of pregnancy. The diagnosis must have occurred during the measurement year or the year prior to the measurement year.

Note

- *The following notations or examples of documentation are considered "negative findings" and do not count as numerator compliant.*
  - *No BMI or BMI percentile documented in medical record or plotted on age-growth chart.*
  - *Notation of weight only.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table ABA-1/2/3: Data Elements for Adult BMI Assessment

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		✓
Current year's administrative rate (before exclusions)		✓
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		✓
Administrative rate on MRSS		✓
Number of medical records excluded because of valid data errors		✓
Number of administrative data records excluded		✓
Number of medical records excluded		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	✓	✓
Numerator events by medical records		✓
Numerator events by supplemental data	✓	✓
Reported rate	✓	✓

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Adult BMI Assessment

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age as of June 30"). The denominator age may be changed if the range is within the specified age range (18–74 years). Organizations must consult clinical guidelines when considering whether to expand the age ranges outside of the current thresholds.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefit	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Only events or diagnoses that contain (or map to) codes in value sets may be used to identify visits. The value sets and logic may not be changed.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
BMI or BMI Percentile	No	Value sets and logic may not be changed.

Quality ID #325: Adult Major Depressive Disorder (MDD): Coordination of Care of Patients with Specific Comorbid Conditions
– National Quality Strategy Domain: Communication and Care Coordination
– Meaningful Measure Area: Prevention, Treatment, and Management of Mental Health

2019 COLLECTION TYPE:
MIPS CLINICAL QUALITY MEASURES (CQMS)

MEASURE TYPE:
Process – High Priority

DESCRIPTION:
Percentage of medical records of patients aged 18 years and older with a diagnosis of major depressive disorder (MDD) and a specific diagnosed comorbid condition (diabetes, coronary artery disease, ischemic stroke, intracranial hemorrhage, chronic kidney disease [Stages 4 or 5], End Stage Renal Disease [ESRD] or congestive heart failure) being treated by another clinician with communication to the clinician treating the comorbid condition

INSTRUCTIONS:
This measure is to be submitted a minimum of **once per performance period** for all patients with a diagnosis of MDD seen during the performance period. This measure may be submitted by Merit-based Incentive Payment System (MIPS) eligible clinicians who perform the quality actions described in the measure for the primary management of patients with major depressive disorder based on the services provided and the measure-specific denominator coding.

Measure Submission Type:
Measure data may be submitted by individual MIPS eligible clinicians, groups, or third party intermediaries. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure. The quality-data codes listed do not need to be submitted by MIPS eligible clinicians, groups, or third party intermediaries that utilize this modality for submissions; however, these codes may be submitted for those third party intermediaries that utilize Medicare Part B claims data. For more information regarding Application Programming Interface (API), please refer to the Quality Payment Program (QPP) website.

DENOMINATOR:
All medical records of patients aged 18 years and older with a diagnosis of major depressive disorder (MDD) and a specific diagnosed comorbid condition (diabetes, coronary artery disease, ischemic stroke, intracranial hemorrhage, chronic kidney disease [Stages 4 or 5], ESRD or congestive heart failure) being treated by another clinician

Definition:
Comorbid condition – For the purposes of this measure, only the following comorbid conditions will be included:

1) Diabetes
2) Coronary artery disease
3) Stroke, including ischemic stroke and intracranial hemorrhage
4) Chronic Kidney Disease (Stages 4 and 5) and End Stage Renal Disease
5) Congestive Heart Failure

Denominator Criteria (Eligible Cases):
Patients aged ≥ 18 years on date of encounter
AND
Diagnosis for MDD (ICD-10-CM): F32.0, F32.1, F32.2, F32.3, F32.9, F33.0, F33.1, F33.2, F33.3, F33.9
AND

Patient encounter during the performance period (CPT): 90791, 90792, 90832, 90834, 90837, 90845, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99484, 99492, 99493, 99494

AND

Diagnosis for diabetes (ICD-10-CM): E10.10, E10.11, E10.21, E10.22, E10.29, E10.311, E10.319, E10.3211, E10.3212. E10.3213, E10.3219, E10.3291, E10.3292, E10.3293, E10.3299, E10.3311, E10.3312, E10.3313, E10.3319, E10.3391, E10.3392, E10.3393, E10.3399, E10.3411, E10.3412, E10.3413, E10.3419, E10.3491, E10.3492, E10.3493, E10.3499, E10.3511, E10.3512, E10.3513, E10.3519, E10.3521, E10.3522, E10.3523, E10.3529, E10.3531, E10.3532, E10.3533, E10.3539, E10.3541, E10.3542, E10.3543, E10.3549, E10.3551, E10.3552, E10.3553, E10.3559, E10.3591, E10.3592, E10.3593, E10.3599, E10.36, E10.39, E10.40, E10.41, E10.42, E10.43, E10.44, E10.49, E10.51, E10.52, E10.59, E10.610, E10.618, E10.620, E10.621, E10.622, E10.628, E10.630, E10.638, E10.641, E10.649, E10.65, E10.69, E10.8, E10.9, E11.00, E11.01, E11.10, E11.11, E11.21, E11.22, E11.29, E11.37X1, E11.37X2, E11.37X3, E11.37X9, E11.319, E11.3211, E11.3212, E11.3213, E11.3219, E11.3291, E11.3292, E11.3293, E11.3299, E11.3311, E11.3312, E11.3313, E11.3319, E11.3391, E11.3392, E11.3393, E11.3399, E11.3411, E11.3412, E11.3413, E11.3419, E11.3491, E11.3492, E11.3493, E11.3499, E11.3511, E11.3512, E11.3513, E11.3519, E11.3521, E11.3522, E11.3523, E11.3529, E11.3531, E11.3532, E11.3533, E11.3539, E11.3541, E11.3542, E11.3543, E11.3549, E11.3551, E11.3552, E11.3553, E11.3559, E11.3591, E11.3592, E11.3593, E11.3599, E11.36, E11.39, E11.40, E11.41, E11.42, E11.43, E11.44, E11.49, E11.51, E11.52, E11.59, E11.610, E11.618, E11.620, E11.621, E11.622, E11.628, E11.630, E11.638, E11.641, E11.649, E11.65, E11.69, E11.8, E11.9, E13.00, E13.01, E13.10, E13.11, E13.21, E13.22, E13.29, E13.311, E13.319, E13.3211, E13.3212, E13.3213, E13.3219, E13.3291, E13.3292, E13.3293, E13.3299, E13.3311, E13.3312, E13.3313, E13.3319, E13.3391, E13.3392, E13.3393, E13.3399, E13.3411, E13.3412, E13.3413, E13.3419, E13.3491, E13.3492, E13.3493, E13.3499, E13.3511, E13.3512, E13.3513, E13.3519, E13.3521, E13.3522, E13.3523, E13.3529, E13.3531, E13.3532, E13.3533, E13.3539, E13.3541, E13.3542, E13.3543, E13.3549, E13.3551, E13.3552, E13.3553, E13.3559, E13.3591, E13.3592, E13.3593, E13.3599, E13.36, E13.39, E13.40, E13.41, E13.42, E13.43, E13.44, E13.49, E13.51, E13.52, E13.59, E13.610, E13.618, E13.620, E13.621, E13.622, E13.628, E13.630, E13.638, E13.641, E13.649, E13.65, E13.69, E13.8, E13.9

OR

Diagnosis for CAD (ICD-10-CM): I20.0, I20.1, I20.8, I20.9, I21.01, I21.02, I21.09, I21.11, I21.19, I21.21, I21.29, I21.3, I21.4, I22.0, I22.1, I22.2, I22.8, I22.9, I24.0, I24.1, I24.8, I24.9, I25.10, I25.110, I25.111, I25.118, I25.119, I25.2, I25.5, I25.6, I25.700, I25.701, I25.708, I25.709, I25.710, I25.711, I25.718, I25.719, I25.720, I25.721, I25.728, I25.729, I25.730, I25.731, I25.738, I25.739, I25.750, I25.751, I25.758, I25.759, I25.760, I25.761, I25.768, I25.769, I25.790, I25.791, I25.798, I25.799, I25.810, I25.811, I25.812, I25.82, I25.83, I25.89, I25.9, Z95.1, Z95.5, Z98.61

OR

Diagnosis for stroke, including ischemic stroke and intracranial hemorrhage (ICD-10-CM): I60.00, I60.01, I60.02, I60.10, I60.11, I60.12, I60.2, I60.30, I60.31, I60.32, I60.4, I60.50, I60.51, I60.52, I60.6, I60.7, I60.8, I60.9, I61.0, I61.1, I61.2, I61.3, I61.4, I61.5, I61.6, I61.8, I61.9, I62.00, I62.01, I62.02, I62.03, I62.1, I62.9, I63.00, I63.013, I63.019, I63.02, I63.033, I63.039, I63.09, I63.10, I63.113,, I63.119, I63.12, I63.133, I63.139, I63.19, I63.20, I63.213, I63.219, I63.22, I63.233, I63.239, I63.29, I63.30, I63.311, I63.313, I63.319, I63.323, I63.329, I63.333, I63.339, I63.341, I63.342, I63.349, I63.39, I63.40, I63.413, I63.419, I63.423, I63.429, I63.433, I63.439, I63.441, I63.442, I63.449, I63.49, I63.50, I63.513, I63.519, I63.523, I63.529, I63.533, I63.539, I63.541, I63.543, I63.549, I63.59, I63.6, I63.8, I63.9

OR

Diagnosis for chronic kidney disease (Stages 4 and 5) and end stage renal disease (ICD-10-CM): N18.4, N18.5, N18.6

OR

Diagnosis for heart failure (ICD-10-CM): I11.0, I13.0, I13.2, I50.1, I50.20, I50.21, I50.22, I50.23, I50.30, I50.31, I50.32, I50.33, I50.40, I50.41, I50.42, I50.43, I50.9

NUMERATOR:
Medical records of patients with communication to the clinician treating the comorbid condition

Definition:
Communication – Transmission of relevant clinical information which specifies that the patient has MDD.

NUMERATOR NOTE: *Denominator Exception(s) are determined on the date of the denominator eligible encounter.*

Numerator Options:

Performance Met:	Clinician treating Major Depressive Disorder communicates to clinician treating comorbid condition **(G8959)**
OR	
Denominator Exception:	Clinician treating Major Depressive Disorder did not communicate to clinician treating comorbid condition for specified patient reason (e.g. patient is unable to communicate the diagnosis of a comorbid condition; the patient is unwilling to communicate the diagnosis of a comorbid condition; or he patient is unaware of the comorbid condition, or any other specified patient reason) **(G9232)**
OR	
Performance Not Met:	Clinician treating Major Depressive Disorder did not communicate to clinician treating comorbid condition, reason not given **(G8960)**

RATIONALE:
Depressive disorders are more common among persons with chronic conditions (e.g., obesity, cardiovascular disease, diabetes, asthma, arthritis, and cancer) and among those with unhealthy behaviors (e.g., smoking, physical inactivity, and binge drinking). Comorbidities are more common in the elderly. The highest rates of depression are found in those with strokes (30% to 60%), coronary artery disease (up to 44%), cancer (up to 40%), Parkinson's disease (40%), and Alzheimer's disease (20% to 40%). The coordination of care for patients with depression and certain comorbid conditions is important for managing both the patient's depression and the other present medical condition. Improvements in the coordination of care between clinicians treating a patient with depression and other clinicians treating comorbid conditions can reduce the symptom exacerbation that depression and other conditions may cause to the other. Any [depression] treatment should be integrated with psychiatric management and any other treatments being provided for other diagnoses.

CLINICAL RECOMMENDATION STATEMENTS:
The following evidence statements are quoted verbatim from the referenced clinical guidelines. Only selected portions of the clinical guidelines are quoted here; for more details, please refer to the full guideline.

In patients with major depressive disorder, it is important to recognize and address the potential interplay between major depressive disorder and any co-occurring general medical conditions. (APA, 2010)

The clinical assessment should include identifying any potential interactions between medications used to treat depression and those used to treat general medical conditions. In addition, the psychiatrist (clinician) should consider the effects of prescribed psychotropic medications on the patient's general medical conditions, as well as the effects of interventions for such disorders on the patient's psychiatric condition. (APA, 2010)

Many patients with major depressive disorder will be evaluated by or receive treatment from other health care professionals in addition to the psychiatrist (clinician). If more than one clinician is involved in providing the care, all treating clinicians should have sufficient ongoing contact with the patient and with each other to ensure that care is coordinated, relevant information is available to guide treatment decisions, and treatments are synchronized. (APA, 2010)

In ruling out general medical causes of depressive symptoms, it is important to ensure that a general medical evaluation has been done. (APA, 2010)

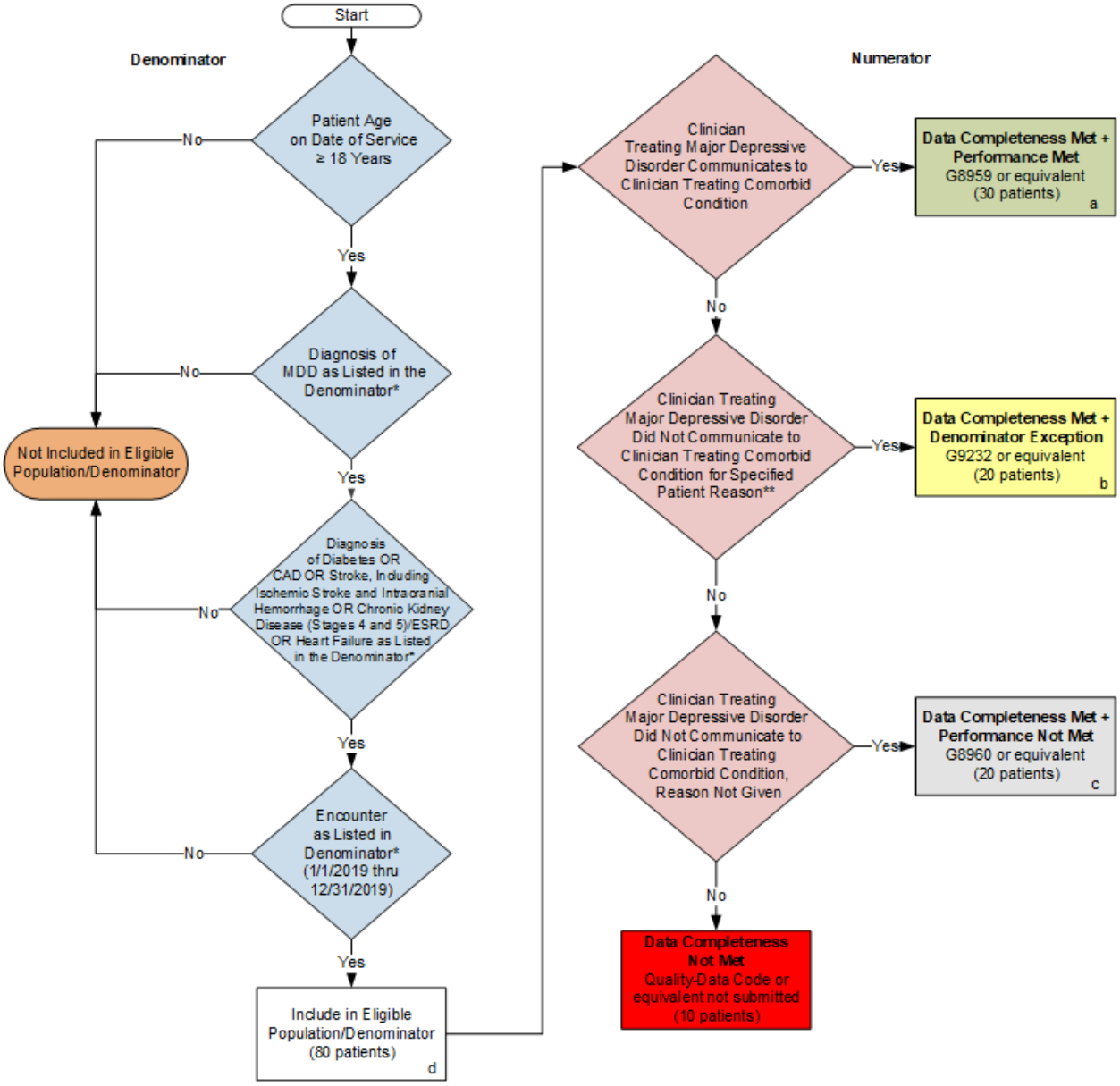
In patients with preexisting hypertension or cardiac conditions, treatment with specific antidepressant agents may suggest a need for monitoring of vital signs or cardiac rhythm (eg, electrocardiogram [ECG] with TCA treatment; heart rate and blood pressure assessment with SNRIs and TCAs). (APA, 2010)

In treating the depressive syndrome that commonly occurs following a stroke, consideration should be given to the potential for interactions between antidepressants and anticoagulating (including antiplatelet) medications. (APA, 2010)

The diagnostic work-up for MDD should include evaluation for existing or emerging medical conditions that may exacerbate the depression. These may include: Cardiovascular diseases, Chronic pain syndrome, Degenerative diseases, Immune disorders, Metabolic endocrine conditions (including kidney and lung diseases), Neoplasms, Trauma. Simultaneous treatment is often required for both the medical problem and psychiatric symptoms and can lead to overall improvement in function. (VA/DoD, 2009)

Indications for referral to a mental health specialist familiar with diabetes management may include gross noncompliance with medical regimen (by self or others), depression with the possibility of self-harm, debilitating anxiety (alone or with depression), indications of an eating disorder, or cognitive functioning that significantly impairs judgment. It is preferable to incorporate psychological assessment and treatment into routine care rather than waiting for identification of a specific problem or deterioration in psychological status. Although the clinician may not feel qualified to treat psychological problems, using the patient-provider relationship as a foundation for further treatment can increase the likelihood that the patient will accept referral for other services. It is important to establish that emotional well-being is part of diabetes management. (ADA, 2010)

2019 Clinical Quality Measure Flow for Quality ID #325: Adult Major Depressive Disorder (MDD): Coordination of Care of Patients with Specific Comorbid Conditions



SAMPLE CALCULATIONS:

Data Completeness=

Performance Met (a=30 patients) + Denominator Exception (b=30 patients) + Performance Not Met (c=20 patients) = 70 patients = **87.50%**

Eligible Population / Denominator (d=80 patients) = 80 patients

Performance Rate=

Performance Met (a=30 patients) = 30 patients = **60.00%**

Data Completeness Numerator (80 patients) – Denominator Exception (b=30 patients) = 50 patients

* See the posted Measure Specification for specific coding and instructions to submit this measure.

** See the posted Measure Specification for exclusion criteria for this measure.

NOTE : Submission Frequency - Patient-process

v3

2019 Clinical Quality Measure Flow Narrative for Quality ID #325: Adult Major Depressive Disorder (MDD): Coordination of Care of Patients with Specific Comorbid Conditions

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specification.

1. Start with Denominator

2. Check Patient Age:

    a. If Patient Age is greater than or equal to 18 Years at Date of Service equals No during the performance period, do not include in Eligible Population. Stop Processing.

    b. If Patient Age is greater than or equal to 18 Years at Date of Service equals Yes during the performance period, proceed to check Patient Diagnosis.

3. Check Patient Diagnosis:

    a. If Diagnosis of MDD as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.

    b. If Diagnosis of MDD as Listed in the Denominator equals Yes, proceed to check Diagnosis of Diabetes OR CAD OR Stroke, Including Ischemic Stroke and Intracranial Hemorrhage OR Chronic Kidney Disease (Stages 4 and 5)/ESRD OR Heart Failure.

4. Check Diagnosis of Diabetes OR CAD OR Stroke, Including Ischemic Stroke and Intracranial Hemorrhage OR Chronic Kidney Disease (Stages 4 and 5)/ESRD OR Heart Failure:

    a. If Diagnosis of Diabetes OR CAD OR Stroke OR Chronic Kidney Disease (Stages 4 and 5)/ESRD OR Heart Failure as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.

    b. If Diagnosis of Diabetes OR CAD OR Stroke OR Chronic Kidney Disease (Stages 4 and 5)/ESRD OR Heart Failure as Listed in the Denominator equals Yes, proceed to check Encounter Performed.

5. Check Encounter Performed:

    a. If Encounter as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.

    b. If Encounter as Listed in the Denominator equals Yes, include in the Eligible Population

6. Denominator Population:

    a. Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 80 patients in the Sample Calculation.

7. Start Numerator

8. Check Clinician Treating Major Depressive Disorder Communicates to Clinician Treating Comorbid Condition:

    a. If Clinician Treating Major Depressive Disorder Communicates to Clinician Treating Comorbid Condition equals Yes, include in Data Completeness Met and Performance Met.

    b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a equals 30 patients in the Sample Calculation.

    c. If Clinician Treating Major Depressive Disorder Communicates to Clinician Treating Comorbid Condition equals No, proceed to check Clinician Treating Major Depressive Disorder Did Not Communicate to Clinician Treating Comorbid Condition for Specified Patient Reason.

9. Check Clinician Treating Major Depressive Disorder Did Not Communicate to Clinician Treating Comorbid Condition for Specified Patient Reason:

    a. If Clinician Treating Major Depressive Disorder Did Not Communicate to Clinician Treating Comorbid Condition for Specified Patient Reason equals Yes, include in the Data Completeness Met and Denominator Exception.

    b. Data Completeness Met and Denominator Exception letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter b equals 20 patients in the Sample Calculation.

    c. If Clinician Treating Major Depressive Disorder Did Not Communicate to Clinician Treating Comorbid Condition for Specified Patient Reason equals No, proceed to check Clinician Treating Major Depressive Disorder Did Not Communicate to Clinician Treating Comorbid Condition, Reason Not Given.

10. Check Clinician Treating Major Depressive Disorder Did Not Communicate to Clinician Treating Comorbid Condition, Reason Not Given:

    a. If Clinician Treating Major Depressive Disorder Did Not Communicate to Clinician Treating Comorbid Condition, Reason Not Given equals Yes, include in the Data Completeness Met and Performance Not Met.

    b. Data Completeness Met and Performance Not Met letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 20 patients in the Sample Calculation.

    c. If Clinician Treating Major Depressive Disorder Did Not Communicate to Clinician Treating Comorbid Condition, Reason Not Given equals No, proceed to check Data Completeness Not Met.

11. Check Data Completeness Not Met:

    a. If Data Completeness Not Met, the Quality Data Code or equivalent was not submitted. 10 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

SAMPLE CALCULATIONS:

Data Completeness=

Performance Met (a=30 patients) + Denominator Exception (b=30 patients) + Performance Not Met (c=20 patients) = 70 patients = **87.50%**

Eligible Population / Denominator (d=80 patients) = 80 patients

Performance Rate=

Performance Met (a=30 patients) = 30 patients = **60.00%**

Data Completeness Numerator (80 patients) – Denominator Exception (b=30 patients) = 50 patients

eCQM Title	**Adult Major Depressive Disorder (MDD): Suicide Risk Assessment**		
eCQM Identifier (Measure Authoring Tool)	161	**eCQM Version number**	7.2.000
NQF Number	0104	**GUID**	60176fbf-bfdc-4892-9c9e-604f206553c8
Measurement Period	January 1, 20XX through December 31, 20XX		
Measure Steward	PCPI(R) Foundation (PCPI[R])		
Measure Developer	American Medical Association (AMA)		
Measure Developer	PCPI(R) Foundation (PCPI[R])		
Endorsed By	National Quality Forum		
Description	Percentage of patients aged 18 years and older with a diagnosis of major depressive disorder (MDD) with a suicide risk assessment completed during the visit in which a new diagnosis or recurrent episode was identified		
Copyright	Copyright 2018 PCPI(R) Foundation and American Medical Association. All Rights Reserved.		
Disclaimer	The Measure is not a clinical guideline, does not establish a standard of medical care, and has not been tested for all potential applications. The Measure, while copyrighted, can be reproduced and distributed, without modification, for noncommercial purposes, eg, use by health care providers in connection with their practices. Commercial use is defined as the sale, license, or distribution of the Measure for commercial gain, or incorporation of the Measure into a product or service that is sold, licensed or distributed for commercial gain. Commercial uses of the Measure require a license agreement between the user and the PCPI(R) Foundation (PCPI[R]) or the American Medical Association (AMA). Neither the AMA, nor the former AMA-convened Physician Consortium for Performance Improvement(R) (AMA-PCPI), nor PCPI, nor their members shall be responsible for any use of the Measure. AMA and PCPI encourage use of the Measure by other health care professionals, where appropriate. THE MEASURE AND SPECIFICATIONS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. Limited proprietary coding is contained in the Measure specifications for convenience. Users of the proprietary code sets should obtain all necessary licenses from the owners of these code sets. The AMA, the PCPI and its members and former members of the AMA-PCPI disclaim all liability for use or accuracy of any Current Procedural Terminology (CPT[R]) or other coding contained in the specifications. CPT(R) contained in the Measure specifications is copyright 2004-2017 American Medical Association. LOINC(R) is copyright 2004-2017 Regenstrief Institute, Inc. This material contains SNOMED Clinical Terms(R) (SNOMED CT[R]) copyright 2004-2017 International Health Terminology Standards Development Organisation. ICD-10 is copyright 2017 World Health Organization. All Rights Reserved. Due to technical limitations, registered trademarks are indicated by (R) or [R].		
Measure Scoring	Proportion		
Measure Type	Process		
Stratification	None		
Risk Adjustment	None		
Rate Aggregation	None		
Rationale	Research has shown that more than 90% of people who kill themselves have depression or another diagnosable mental or substance abuse disorder. Depression is the cause of over two-thirds of the reported suicides in the U.S. each year. The intent of this measure is for a clinician to assess suicide risk at initial intake or at the visit in which depression was diagnosed. As the guidelines state, it is important to assess for additional factors which may increase or decrease suicide risk, such as presence of additional symptoms (eg, psychosis, severe anxiety, hopelessness, severe chronic pain); presence of substance abuse, history and seriousness of previous attempts, particularly, recent suicidal behavior, current stressors and potential protective factors (eg, positive reasons for living, strong social support), family history of suicide or mental illness or recent exposure to suicide, impulsivity and potential for risk to others, including history of violence or violent or homicidal ideas, plans, or intentions, and putting one's affairs in order (eg, giving away possessions, writing a will). In addition, although the measure focuses on the initial visit, it is critical that suicide risk be monitored especially for the 90 days following the initial visit and throughout MDD treatment.		
Clinical Recommendation Statement	A careful and ongoing evaluation of suicide risk is necessary for all patients with major depressive disorder [I]. (APA, 2010, Reaffirmed 2015) Such an assessment includes specific inquiry about suicidal thoughts, intent, plans, means, and behaviors; identification of specific psychiatric symptoms (eg, psychosis, severe anxiety, substance use) or general medical conditions that may increase the likelihood of acting on suicidal ideas; assessment of past and, particularly, recent suicidal behavior; delineation of current stressors and potential protective factors (eg, positive reasons for living, strong social support); and identification of any family history of suicide or mental illness [I]. (APA, 2010, Reaffirmed 2015) As part of the assessment process, impulsivity and potential for risk to others should also be evaluated, including any history of violence or violent or homicidal ideas, plans, or intentions [I]. (APA, 2010, Reaffirmed 2015) The patient's risk of harm to him- or herself and to others should also be monitored as treatment proceeds [I]. (APA, 2010, Reaffirmed 2015) Guidelines for Selecting a Treatment Setting for Patients at Risk for Suicide or Suicidal Behaviors (from APA's Practice Guideline for Assessment and Treatment of Patients With Suicidal Behaviors, 2010): Admission generally indicated After a suicide attempt or aborted suicide attempt if: * Patient is psychotic * Attempt was violent, near-lethal, or premeditated * Precautions were taken to avoid rescue or discovery * Persistent plan and/or intent is present * Distress is increased or patient regrets surviving * Patient is male, older than age 45 years, especially with new onset of psychiatric illness or suicidal thinking * Patient has limited family and/or social support, including lack of stable living situation * Current impulsive behavior, severe agitation, poor judgment, or refusal of help is evident * Patient has change in mental status with a metabolic, toxic, infectious, or other etiology requiring further workup in a structured setting In the presence of suicidal ideation with: * Specific plan with high lethality * High suicidal intent Admission may be necessary		

	After a suicide attempt or aborted suicide attempt, except in circumstances for which admission is generally indicated In the presence of suicidal ideation with: * Psychosis * Major psychiatric disorder * Past attempts, particularly if medically serious * Possibly contributing medical condition (eg, acute neurological disorder, cancer, infection) * Lack of response to or inability to cooperate with partial hospital or outpatient treatment * Need for supervised setting for medication trial or ECT * Need for skilled observation, clinical tests, or diagnostic assessments that require a structured setting * Limited family and/or social support, including lack of stable living situation * Lack of an ongoing clinician-patient relationship or lack of access to timely outpatient follow-up * [Evidence of putting one's affairs in order (eg, giving away possessions, writing a will)] In the absence of suicide attempts or reported suicidal ideation/plan/intent but evidence from the psychiatric evaluation and/or history from others suggests a high level of suicide risk and a recent acute increase in risk Release from emergency department with follow-up recommendations may be possible After a suicide attempt or in the presence of suicidal ideation/plan when: * Suicidality is a reaction to precipitating events (eg, exam failure, relationship difficulties), particularly if the patient's view of situation has changed since coming to emergency department * Plan/method and intent have low lethality * Patient has stable and supportive living situation * Patient is able to cooperate with recommendations for follow-up, with treater contacted, if possible, if patient is currently in treatment Outpatient treatment may be more beneficial than hospitalization Patient has chronic suicidal ideation and/or self-injury without prior medically serious attempts, if a safe and supportive living situation is available and outpatient psychiatric care is ongoing.
Improvement Notation	Higher score indicates better quality
Reference	American Psychiatric Association (APA). Practice Guideline for the Treatment of Patients With Major Depressive Disorder, Third Edition--2010. This guideline was reaffirmed in 2015. Accessed on October 17, 2017 from http://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/mdd.pdf.
Reference	American Psychiatric Association (APA). Guidelines for Selecting a Treatment Setting for Patients at Risk for Suicide or Suicidal Behaviors. 2010. Accessed on November 1, 2017 from http://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/suicide.pdf
Reference	Conwell Y, Brent D. Suicide and aging I: patterns of psychiatric diagnosis. International Psychogeriatrics, 1995; 7(2): 149-64.
Reference	Statistics on Depression. Depression and Bipolar Support Alliance. <http://www.dbsalliance.org/site/PageServer?pagename=press_facts_depression>. Accessed February 17, 2015.
Definition	Suicide risk assessment - Must include questions about the following: 1) Suicidal ideation 2) Patient's intent of initiating a suicide attempt AND, if either is present, 3) Patient plans for a suicide attempt 4) Whether the patient has means for completing suicide
Guidance	This measure is an episode-of-care measure and should be reported for each instance of a new or recurrent episode of major depressive disorder (MDD); every new or recurrent episode will count separately in the Initial Population. It is expected that a suicide risk assessment will be completed at the visit during which a new diagnosis is made or at the visit during which a recurrent episode is first identified (ie, at the initial evaluation). For the purposes of this measure, an episode of major depressive disorder (MDD) would be considered to be recurrent if a patient has not had an MDD-related encounter in the past 105 days. If there is a gap of 105 or more days between visits for major depressive disorder (MDD), that would imply a recurrent episode. The 105-day look-back period is an operational provision and not a clinical recommendation, or definition of relapse, remission, or recurrence. Use of a standardized tool or instrument to assess suicide risk will meet numerator performance. Standardized tools can be mapped to the concept "Intervention, Performed": "Suicide risk assessment (procedure)" included in the numerator logic below. The logic statement for the age requirement, as written, captures patients who turn 18 years old during the measurement period so that these patients are included in the measure. To ensure all patients with major depressive disorder (MDD) are assessed for suicide risk, there are two clinical quality measures addressing suicide risk assessment; CMS 177 covers children and adolescents aged 6 through 17, and CMS 161 covers the adult population aged 18 years and older.
Transmission Format	TBD
Initial Population	All patients aged 18 years and older with a diagnosis of major depressive disorder (MDD)
Denominator	Equals Initial Population
Denominator Exclusions	None
Numerator	Patients with a suicide risk assessment completed during the visit in which a new diagnosis or recurrent episode was identified
Numerator Exclusions	Not Applicable
Denominator Exceptions	None
Supplemental Data Elements	For every patient evaluated by this measure also identify payer, race, ethnicity and sex

Table of Contents

Population Criteria

◢ Initial Population

```
"New or Recurrent Major Depressive Disorder Encounter" NewOrRecurrentMDDEncounter
    with ["Patient Characteristic Birthdate"] BirthDate
        such that Global."CalendarAgeInYearsAt"(BirthDate.birthDatetime, start of "Measurement Period")>= 17
```

Denominator

```
"Initial Population"
```

Denominator Exclusions

None

Numerator

```
"New or Recurrent Major Depressive Disorder Encounter" NewOrRecurrentMDDEncounter
    with ["Intervention, Performed": "Suicide risk assessment (procedure)"] SuicideRiskAssessment
        such that SuicideRiskAssessment.relevantPeriod during NewOrRecurrentMDDEncounter.relevantPeriod
```

Numerator Exclusions

None

Denominator Exceptions

None

Stratification

None

Definitions

Denominator

```
"Initial Population"
```

Initial Population

```
"New or Recurrent Major Depressive Disorder Encounter" NewOrRecurrentMDDEncounter
    with ["Patient Characteristic Birthdate"] BirthDate
        such that Global."CalendarAgeInYearsAt"(BirthDate.birthDatetime, start of "Measurement Period")>= 17
```

Major Depressive Disorder Encounter

```
( ["Encounter, Performed": "Psych Visit - Diagnostic Evaluation"]
    union ["Encounter, Performed": "Emergency Department Visit"]
    union ["Encounter, Performed": "Office Visit"]
    union ["Encounter, Performed": "Outpatient Consultation"]
    union ["Encounter, Performed": "Psych Visit - Psychotherapy"]
    union ["Encounter, Performed": "Psychoanalysis"] ) ValidEncounter
    where exists ( ValidEncounter.diagnoses EncounterDiagnosis
            where EncounterDiagnosis in "Major Depressive Disorder-Active"
    )
```

New or Recurrent Major Depressive Disorder Encounter

```
"Major Depressive Disorder Encounter" NewOrRecurrentMDDEncounter
    without "Major Depressive Disorder Encounter" PriorMDDEpisodeEncounter
        such that PriorMDDEpisodeEncounter !~ NewOrRecurrentMDDEncounter
            and PriorMDDEpisodeEncounter.relevantPeriod ends 104 days or less before day of start of NewOrRecurrentMDDEncounter.relevantPeriod
    where NewOrRecurrentMDDEncounter.relevantPeriod during "Measurement Period"
```

Numerator

```
"New or Recurrent Major Depressive Disorder Encounter" NewOrRecurrentMDDEncounter
    with ["Intervention, Performed": "Suicide risk assessment (procedure)"] SuicideRiskAssessment
        such that SuicideRiskAssessment.relevantPeriod during NewOrRecurrentMDDEncounter.relevantPeriod
```

SDE Ethnicity

```
["Patient Characteristic Ethnicity": "Ethnicity"]
```

SDE Payer

```
["Patient Characteristic Payer": "Payer"]
```

SDE Race

```
["Patient Characteristic Race": "Race"]
```

SDE Sex

```
["Patient Characteristic Sex": "ONC Administrative Sex"]
```

Functions

Global.CalendarAgeInYearsAt(BirthDateTime DateTime, AsOf DateTime)

```
years between ToDate(BirthDateTime)and ToDate(AsOf)
```

Global.ToDate(Value DateTime)

```
DateTime(year from Value, month from Value, day from Value, 0, 0, 0, 0, timezone from Value)
```

Terminology

- codesystem "SNOMEDCT" using "2.16.840.1.113883.6.96 version 2017-09"
- code "Suicide risk assessment (procedure)" using "SNOMEDCT version 2017-09 Code (225337009)"
- valueset "Emergency Department Visit" using "2.16.840.1.113883.3.464.1003.101.12.1010"
- valueset "Ethnicity" using "2.16.840.1.114222.4.11.837"
- valueset "Major Depressive Disorder-Active" using "2.16.840.1.113883.3.526.3.1491"
- valueset "Office Visit" using "2.16.840.1.113883.3.464.1003.101.12.1001"

- valueset "ONC Administrative Sex" using "2.16.840.1.113762.1.4.1"
- valueset "Outpatient Consultation" using "2.16.840.1.113883.3.464.1003.101.12.1008"
- valueset "Payer" using "2.16.840.1.114222.4.11.3591"
- valueset "Psych Visit - Diagnostic Evaluation" using "2.16.840.1.113883.3.526.3.1492"
- valueset "Psych Visit - Psychotherapy" using "2.16.840.1.113883.3.526.3.1496"
- valueset "Psychoanalysis" using "2.16.840.1.113883.3.526.3.1141"
- valueset "Race" using "2.16.840.1.114222.4.11.836"

Data Criteria (QDM Data Elements)

- "Encounter, Performed: Emergency Department Visit" using "Emergency Department Visit (2.16.840.1.113883.3.464.1003.101.12.1010)"
- "Encounter, Performed: Office Visit" using "Office Visit (2.16.840.1.113883.3.464.1003.101.12.1001)"
- "Encounter, Performed: Outpatient Consultation" using "Outpatient Consultation (2.16.840.1.113883.3.464.1003.101.12.1008)"
- "Encounter, Performed: Psych Visit - Diagnostic Evaluation" using "Psych Visit - Diagnostic Evaluation (2.16.840.1.113883.3.526.3.1492)"
- "Encounter, Performed: Psych Visit - Psychotherapy" using "Psych Visit - Psychotherapy (2.16.840.1.113883.3.526.3.1496)"
- "Encounter, Performed: Psychoanalysis" using "Psychoanalysis (2.16.840.1.113883.3.526.3.1141)"
- "Patient Characteristic Ethnicity: Ethnicity" using "Ethnicity (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic Payer: Payer" using "Payer (2.16.840.1.114222.4.11.3591)"
- "Patient Characteristic Race: Race" using "Race (2.16.840.1.114222.4.11.836)"
- "Patient Characteristic Sex: ONC Administrative Sex" using "ONC Administrative Sex (2.16.840.1.113762.1.4.1)"
- "Intervention, Performed: Suicide risk assessment (procedure)" using "Suicide risk assessment (procedure) (SNOMEDCT version 2017-09 Code 225337009)"

Supplemental Data Elements

SDE Ethnicity

["Patient Characteristic Ethnicity": "Ethnicity"]

SDE Payer

["Patient Characteristic Payer": "Payer"]

SDE Race

["Patient Characteristic Race": "Race"]

SDE Sex

["Patient Characteristic Sex": "ONC Administrative Sex"]

Risk Adjustment Variables

None

Measure Set	None

NQF ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE

Measure Information Form
Collected For: The Joint Commission Only

Measure Set: Substance Use (SUB)

Set Measure ID #: SUB-3

Performance Measure Name:

SUB-3 Alcohol and Other Drug Use Disorder Treatment Provided or Offered at Discharge

SUB-3a Alcohol and Other Drug Use Disorder Treatment at Discharge

Description:

SUB-3 Patients who are identified with alcohol or drug use disorder who receive or refuse at discharge a prescription for FDA-approved medications for alcohol or drug use disorder, OR who receive or refuse a referral for addictions treatment.

SUB-3a Patients who are identified with alcohol or drug disorder who receive a prescription for FDA-approved medications for alcohol or drug use disorder OR a referral for addictions treatment.

The measure is reported as an overall rate which includes all patients to whom alcohol or drug use disorder treatment was provided, or offered and refused, at the time of hospital discharge, and a second rate, a subset of the first, which includes only those patients who received alcohol or drug use disorder treatment at discharge. The Provided or Offered rate (SUB-3) describes patients who are identified with alcohol or drug use disorder who receive or refuse at discharge a prescription for FDA-approved medications for alcohol or drug use disorder, OR who receive or refuse a referral for addictions treatment. The Alcohol and Other Drug Disorder Treatment at Discharge (SUB-3a) rate describes only those who receive a prescription for FDA-approved medications for alcohol or drug use disorder OR a referral for addictions treatment. Those who refused are not included.

Rationale: Excessive use of alcohol and drugs has a substantial harmful impact on health and society in the United States. It is a drain on the economy and a source of enormous personal tragedy (The National Quality Forum, A Consensus Report 2007). In 1998 the economic costs to society were $185 billion dollars for alcohol misuse, and 143 billion dollars for drug misuse (Harwood 2000). Health care spending was 19 billion dollars for alcohol problems, and 14 billion dollars was spent treating drug problems.

Nearly a quarter of a trillion dollars per year in lost productivity is attributable to substance use. More than 537,000 die each year as a consequence of alcohol, drug, and tobacco use making use of these substances the cause of one out of four deaths in the United States (Mokdad 2005).

An estimated 22.6 million adolescents and adults meet criteria for a substance use disorder. In a multi-state study that screened 459,599 patients in general hospital and medical settings, 23% of patients screened positive (Madras 2009).

Clinical trials have demonstrated that brief interventions, especially prior to the onset of addiction, significantly improve health and reduce costs, and that similar benefits occur in those with addictive disorders who are referred to treatment (Fleming 2002).

In a study on the provision of evidence-based care and preventive services provided in hospitals for 30 different medical conditions, quality varied substantially according to diagnosis. Adherence to recommended practices for treatment of substance use ranked last, with only 10% of patients receiving proper care (Gentilello 2005). Currently, less than one in twenty patients with an addiction are referred for treatment (Gentilello 1999).

Hospitalization provides a prime opportunity to address the entire spectrum of substance use problems within the health care system (Gentilello 2005, 1999). Approximately 8% of general hospital inpatients and 40 to 60 percent of traumatically-injured inpatients and psychiatric inpatients have substance use disorders (Gentilello 1999).

Type of Measure: Process

Improvement Noted As: Increase in the rate

Numerator Statement:

SUB-3: The number of patients who received or refused at discharge a prescription for medication for treatment of alcohol or drug use disorder OR received or refused a referral for addictions treatment.

SUB-3a: The number of patients who received a prescription at discharge for medication for treatment of alcohol or drug use disorder OR a referral for addictions treatment.

SUB-3 Numerator Statement Table

	SUB-3	SUB-3a
Included Populations	Patients who refused a prescription for FDA-approved medication for treatment of an alcohol or drug dependence. Patients who refused a referral for addictions treatment.	Not Applicable
Excluded Populations	None	None
Data Elements	*Prescription for Alcohol or Drug Disorder Medication Referral for Addictions Treatment*	*Prescription for Alcohol or Drug Disorder Medication Referral for Addictions Treatment*

Denominator Statement: The number of hospitalized inpatients 18 years of age and older identified with an alcohol or drug use disorder.

Included Populations:

- Patients with ICD-10-CM Principal or Other Diagnosis Code for alcohol or drug use disorder listed on Table 13.1 and 13.2
- Patients with a Principal or Other ICD-10-PCS Procedure Code listed on Table 13.3

Excluded Populations:

- Patients less than 18 years of age
- Patient drinking at unhealthy levels who do not meet criteria for an alcohol use disorder
- Patients who are cognitively impaired
- Patients who expire
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients discharged to another healthcare facility
- Patients discharged to home or another healthcare facility for hospice care
- Patients who have a duration of stay less than or equal to one day or greater than 120 days
- Patients who do not reside in the United States
- Patients receiving *Comfort Measures Only* documented

Data Elements:

- *Admission Date*
- *Alcohol Use Status*
- *Birthdate*
- *Comfort Measures Only*
- *Discharge Date*
- *Discharge Disposition*
- *ICD-10-CM Other Diagnosis Codes*
- *ICD-10-PCS Other Procedure Codes*
- *ICD-10-CM Principal Diagnosis Code*
- *ICD-10-PCS Principal Procedure Code*

Risk Adjustment: No

Data Collection Approach: Retrospective data sources for required data elements include administrative data and medical record documents. Some hospitals may prefer to gather data concurrently by identifying patients in the population of interest. This approach provides opportunities for improvement at the point of care/service. However, complete documentation includes the principal or other ICD-10 diagnosis and procedure codes, which require retrospective data entry.

Data Accuracy: Data accuracy is enhanced when all definitions are used without modification. The data dictionary should be referenced for definitions and abstraction notes when questions arise during data collection.

Variation may exist in the assignment of ICD-10 codes; therefore, coding practices may require evaluation to ensure consistency.

Measure Analysis Suggestions: Hospitals may wish to analyze data to show patients that refused both a medication prescription and referral and those who refused only one or the other.

Sampling: Yes, please refer to the measure set specific sampling requirements and for additional information see the Population and Sampling Specifications section.

Data Reported As: Aggregate rate generated from count data reported as a proportion.

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- Smothers BA, Yahr HT, Ruhl CE. Detection of alcohol use disorders in general hospital admissions in the United States. Arch Intern Med. 2004 Apr 12;164(7):749-56.
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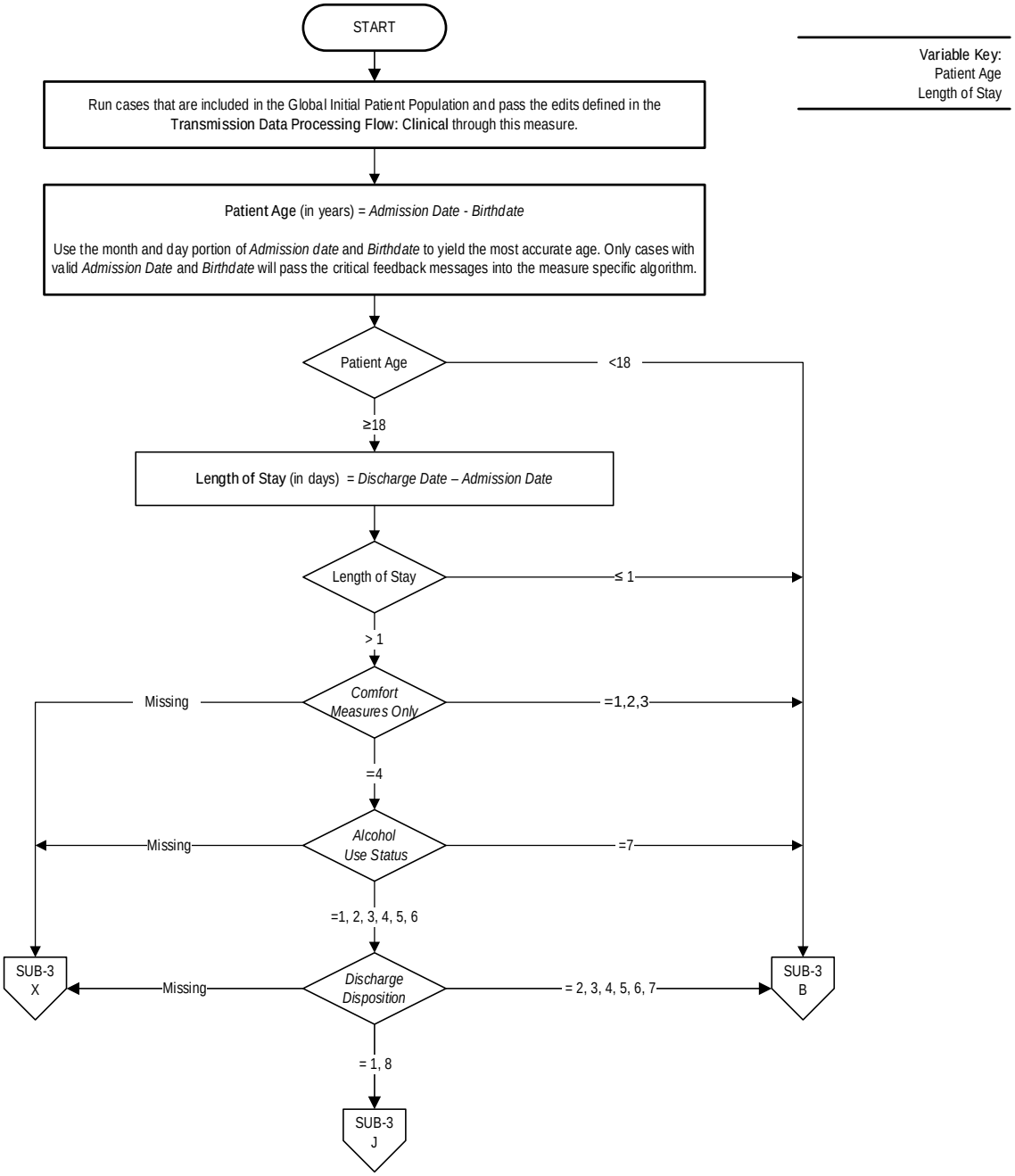
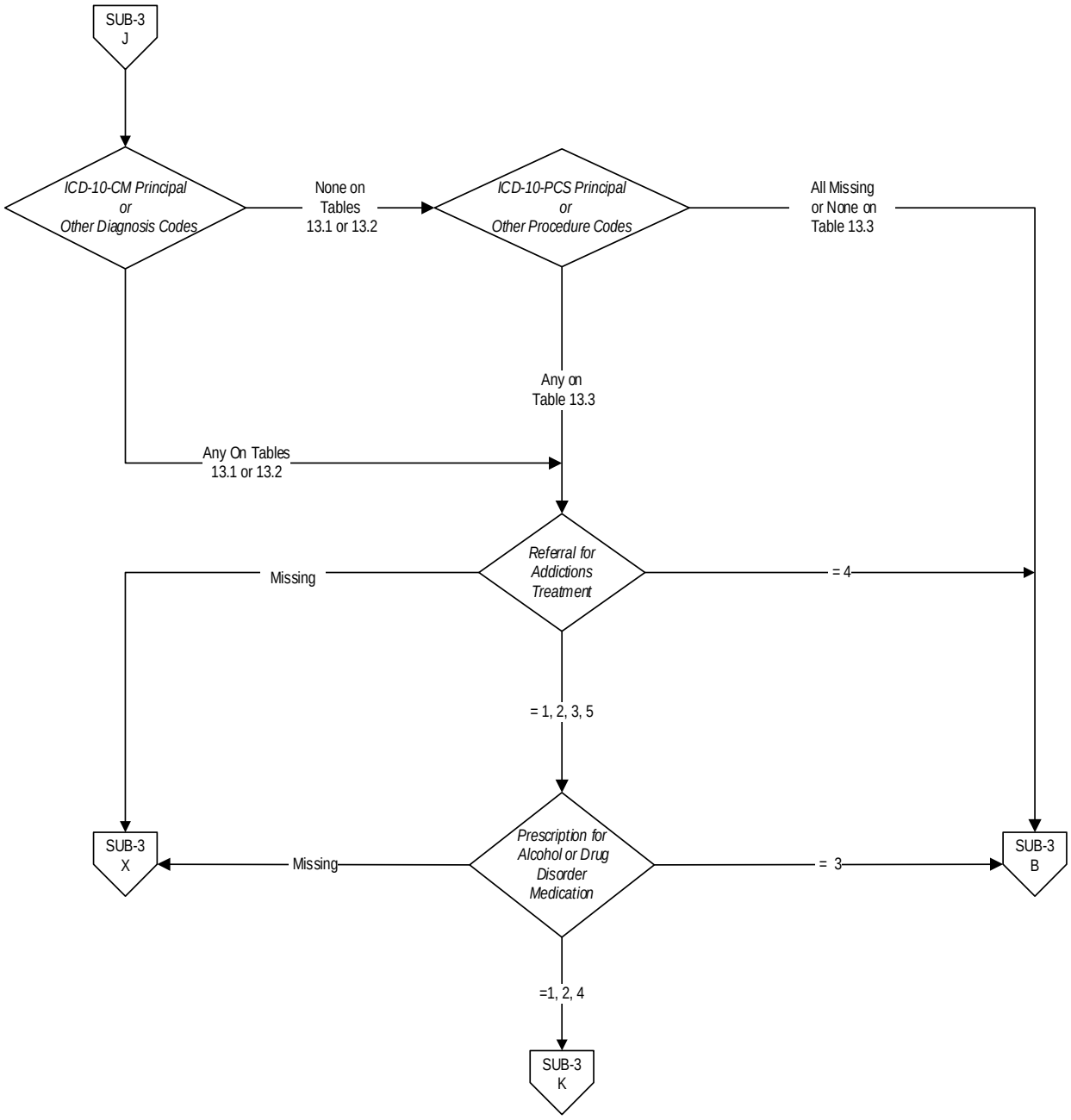
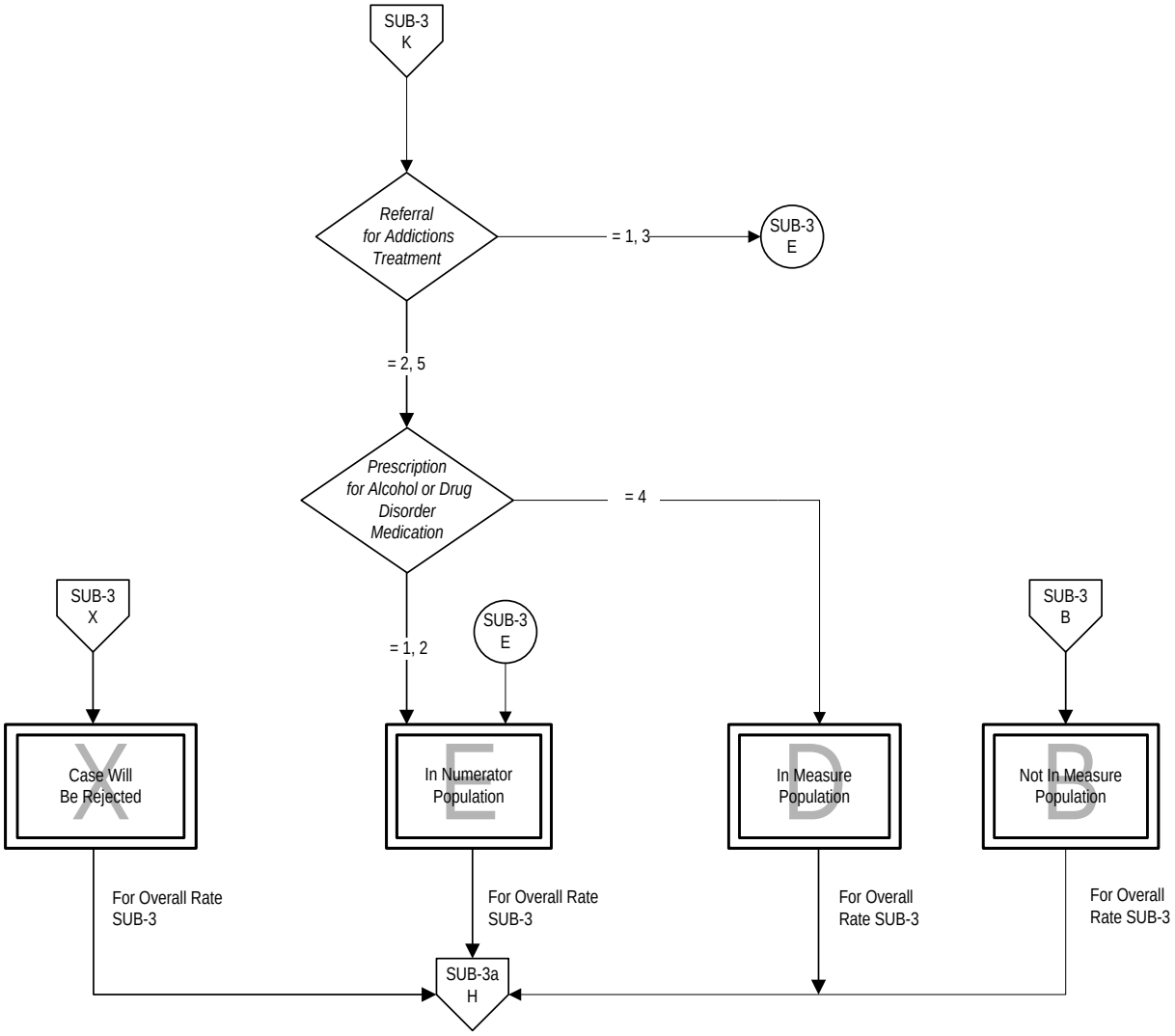
SUB-3: Alcohol and Other Drug Use Disorder Treatment Provided or Offered at Discharge

Numerator: The number of patients who received or refused at discharge a prescription for medication for treatment of alcohol or drug use disorder OR received or refused a referral for addictions treatment.

Denominator: The number of hospitalized inpatients 18 years of age and older identified with an alcohol or drug use disorder.



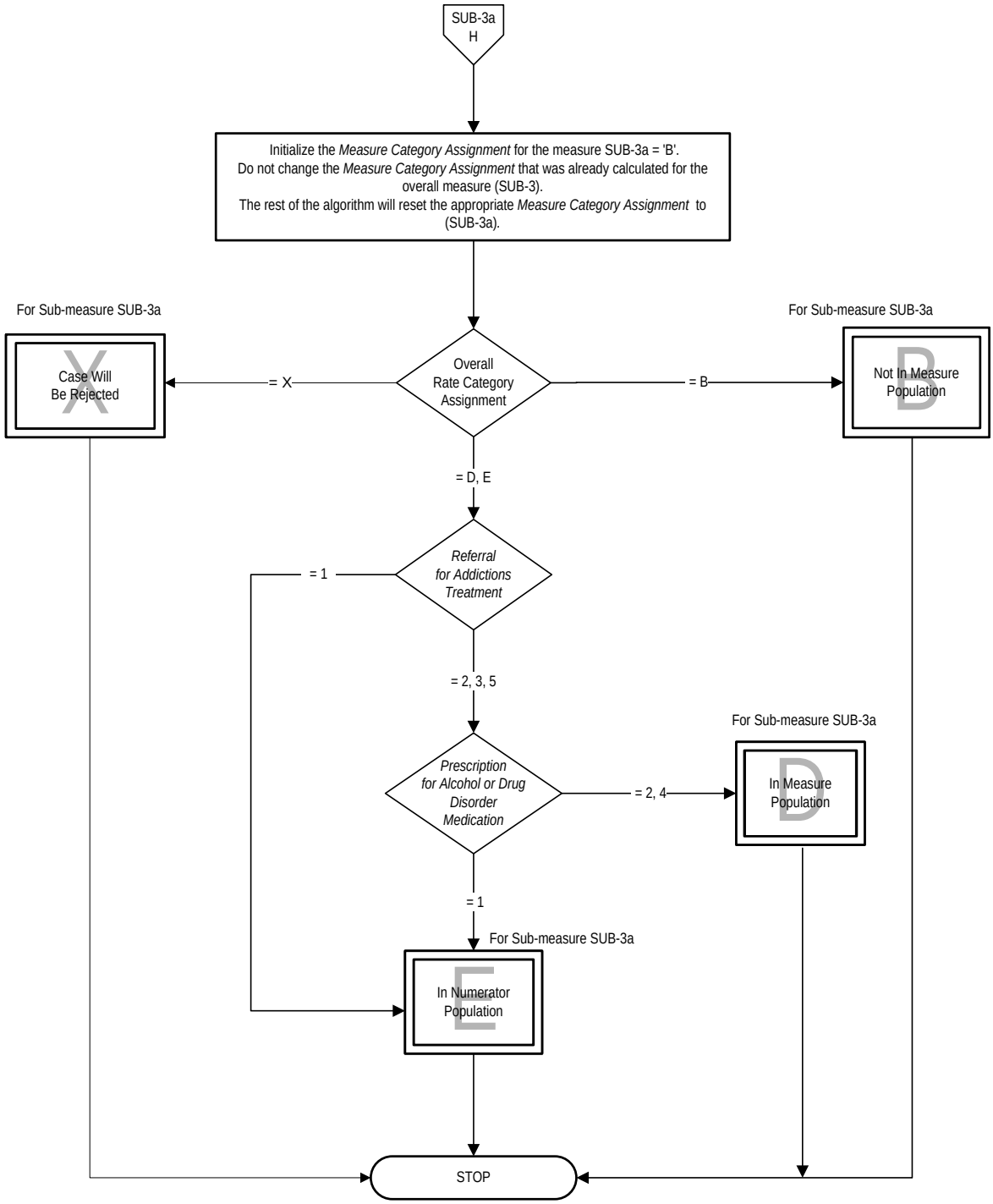

SUB-3
J
ICD-10-CM Principal
or
Other Diagnosis Codes
None on
Tables
13.1 or 13.2
ICD-10-PCS Principal
or
Other Procedure Codes
All Missing
or None on
Table 13.3
Any on
Table 13.3
Any On Tables
13.1 or 13.2
Referral for
Addictions
Treatment
Missing
= 4
= 1, 2, 3, 5
SUB-3
X
Prescription for
Alcohol or Drug
Disorder
Medication
Missing
= 3
SUB-3
B
=1, 2, 4
SUB-3
K


SUB-3
K
Referral
for Addictions
Treatment
= 1, 3
SUB-3
E
= 2, 5
Prescription
for Alcohol or Drug
Disorder
Medication
= 4
SUB-3
X
= 1, 2
SUB-3
E
SUB-3
B
X
Case Will
Be Rejected
E
In Numerator
Population
D
In Measure
Population
D
Not In Measure
Population
For Overall Rate
SUB-3
For Overall Rate
SUB-3
For Overall
Rate SUB-3
For Overall
Rate SUB-3
SUB-3a
H

SUB-3a: Alcohol and Other Drug Use Disorder Treatment at Discharge

Numerator: The number of patients who received a prescription at discharge for medication for treatment of alcohol or drug use disorder OR a referral for addictions treatment.

Denominator: The number of hospitalized inpatients 18 years of age and older identified with an alcohol or drug use disorder.



Algorithm Narrative
SUB-3: Alcohol and Other Drug Use Disorder Treatment Provided or Offered at Discharge

Numerator: The number of patients who received or refused at discharge a prescription for medication for treatment of alcohol or drug use disorder OR received or refused a referral for addictions treatment.

Denominator: The number of hospitalized inpatients 18 years of age and older identified with an alcohol or drug use disorder.

Variable key: Patient Age
Length of Stay

1. Start processing. Run cases that are included in the Global Initial Patient Population and pass the edits defined in the Transmission Data Processing Flow: Clinical through this measure.
2. Calculate Patient Age. Patient Age, in years, is equal to the Admission Date minus the Birthdate. Use the month and day portion of Admission Date and Birthdate to yield the most accurate age. Only cases with valid Admission Date and Birthdate will pass the front end edits into the measure specific algorithms.
3. Check Patient Age
    a. If Patient Age is less than 18 years, the case will proceed to a Measure Category Assignment of B for overall rate SUB-3 and will not be in the Measure Population. Continue processing and proceed to Step 16 to Initialize Measure Category Assignment for sub-measure SUB-3a.
    b. If Patient Age is equal to or greater than 18 years, continue processing and proceed to calculate of Length of Stay.
4. Calculate Length of Stay. Length of Stay, in days, is equal to the Discharge Date minus the Admission Date.
5. Check Length of Stay
    a. If Length of Stay is equal to or less than 1 day, the case will proceed to a Measure Category Assignment of B for overall rate SUB-3 and will not be in the Measure Population. Continue processing and proceed to Step 16 to Initialize Measure Category Assignment for sub-measure SUB-3a.
    b. If Length of Stay is greater than 1 day, continue processing and proceed to check Comfort Measures Only.
6. Check Comfort Measures Only
    a. If Comfort Measures Only is missing, the case will proceed to a Measure Category Assignment of X for overall rate SUB-3 and will be rejected. Continue processing and proceed to Step 16 to Initialize Measure Category Assignment for sub-measure SUB-3a.
    b. If Comfort Measures Only is equal to 1, 2 or 3, the case will proceed to a Measure Category Assignment of B for overall rate SUB-3 and will not be

in the Measure Population. Continue processing and proceed to Step 16 to Initialize Measure Category Assignment for sub-measure SUB-3a.

c. If Comfort Measures Only is equal to 4, continue processing and proceed to check Alcohol Use Status.

7. Check Alcohol Use Status

   a. If Alcohol Use Status is missing, the case will proceed to a Measure Category Assignment of X for overall rate SUB-3 and will be rejected. Continue processing and proceed to Step 16 to Initialize Measure Category Assignment for sub-measure SUB-3a.

   b. If Alcohol Use Status equals 7, the case will proceed to a Measure Category Assignment of B for overall rate SUB-3 and will not be in the Measure Population. Continue processing and proceed to Step 16 to Initialize Measure Category Assignment for sub-measure SUB-3a.

   c. If Alcohol Use Status equals 1,2,3,4,5, or 6, continue processing and proceed to check Discharge Disposition.

8. Check Discharge Disposition

   a. If Discharge Disposition is missing, the case will proceed to a Measure Category Assignment of X for overall rate SUB-3 and will be rejected. Continue processing and proceed to Step 16 to Initialize Measure Category Assignment for sub-measure SUB-3a.

   b. If Discharge Disposition equals 2, 3, 4, 5, 6 or 7, the case will proceed to a Measure Category Assignment of B for overall rate SUB-3 and will not be in the Measure Population. Continue processing and proceed to Step 16 to Initialize Measure Category Assignment for sub-measure SUB-3a.

   c. If Discharge Disposition equals 1 or 8, continue processing and proceed to check ICD-10-CM Principal or Other Diagnosis Codes.

9. Check ICD-10-CM Principal or Other Diagnosis Codes

   a. If none of ICD-10-CM Principal or Other Diagnosis Codes is on Table 13.1 or 13.2, continue processing and proceed to check ICD-10-PCS Principal or Other Procedure Codes.

   b. If any of ICD-10-CM Principal or Other Diagnosis Codes is on Table 13.1 or 13.2, continue processing and proceed to Step 11 to check Referral for Addictions Treatment.

10. Check ICD-10-PCS Principal or Other Procedure Codes

   a. If all missing or none of ICD-10-PCS Principal or Other Procedure Codes is on Table 13.3, the case will proceed to a Measure Category Assignment of B for overall rate SUB-3 and will not be in the Measure Population. Continue processing and proceed to Step 15 to Initialize Measure Category Assignment for sub-measure SUB-3a.

   b. If any of ICD-10-PCS Principal or Other Procedure Codes is on Table 13.3, continue processing and proceed to check Referral for Addictions Treatment.

11. Check Referral for Addictions Treatment

    a. If Referral for Addictions Treatment is missing, the case will proceed to a Measure Category Assignment of X for overall rate SUB-3 and will be rejected. Continue processing and proceed to Step 15 to Initialize Measure Category Assignment for sub-measure SUB-3a.

    b. If Referral for Addictions Treatment equals 4, the case will proceed to a Measure Category Assignment of B for overall rate SUB-3 and will not be in the Measure Population. Continue processing and proceed to Step 15 to Initialize Measure Category Assignment for sub-measure SUB-3a.

    c. If Referral for Addictions Treatment equals 1, 2, 3 or 5, continue processing and proceed to check Prescription for Alcohol or Drug Disorder Medication.

12. Check Prescription for Alcohol or Drug Disorder Medication

    a. If Prescription for Alcohol or Drug Disorder Medication is missing, the case will proceed to a Measure Category Assignment of X for overall rate SUB-3 and will be rejected. Continue processing and proceed to Step 15 to Initialize Measure Category Assignment for sub-measure SUB-3a.

    b. If Prescription for Alcohol or Drug Disorder Medication equals 3, the case will proceed to a Measure Category Assignment of B for overall rate SUB-3 and will not be in the Measure Population. Continue processing and proceed to Step 15 to Initialize Measure Category Assignment for sub-measure SUB-3a.

    c. If Prescription for Alcohol or Drug Disorder Medication equals 1, 2 or 4, continue processing and proceed to recheck Referral for Addictions Treatment.

13. Recheck Referral for Addictions Treatment

    a. If Referral for Addictions Treatment equals 1 or 3, the case will proceed to a Measure Category Assignment of E for overall rate SUB-3 and will be in the Numerator Population. Continue processing and proceed to Step 15 to Initialize Measure Category Assignment for sub-measure SUB-3a.

    b. If Referral for Addictions Treatment equals 2 or 5, continue processing and proceed to recheck Prescription for Alcohol or Drug Disorder Medication.

14. Recheck Prescription for Alcohol or Drug Disorder Medication

    a. If Prescription for Alcohol or Drug Disorder Medication equals 4, the case will proceed to Measure Category Assignment of D and will be in the Measure Population for the overall measure rate SUB-3. Continue processing and proceed to Step 15 to Initialize Measure Category Assignment for sub-measure SUB-3a.

    b. If Prescription for Alcohol or Drug Disorder Medication equals 1 or 2, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population for the overall measure rate SUB-3. Continue processing and proceed to Step 15 to Initialize Measure Category Assignment for sub-measure SUB-3a.

Algorithm Narrative
SUB-3a: Alcohol and Other Drug Use Disorder Treatment at Discharge

Numerator: The number of patients who received a prescription at discharge for medication for treatment of alcohol or drug use disorder OR a referral for addictions treatment.

Denominator: The number of hospitalized inpatients 18 years of age and older identified with alcohol or drug disorder.

15. Initialize the Measure Category Assignment for the sub-measure SUB-3a to Measure Category Assignment B. Do not change the Measure Category Assignment that was already calculated for the overall measure SUB-3. The rest of the algorithm will reset the appropriate Measure Category Assignment to SUB-3a.

16. Check Overall Rate Category Assignment

    a. If Overall Rate Category Assignment equals X, the case will proceed to a Measure Category Assignment of X for sub-measure SUB-3a and will not be in the Measure Population. Stop processing.

    b. If Overall Rate Category Assignment equals B, the case will proceed to a Measure Category Assignment of B for sub-measure SUB-3a and will not be in the Measure Population. Stop processing

    c. If Overall Rate Category Assignment equals D or E, continue processing and proceed to recheck Referral for Addictions Treatment.

17. Recheck Referral for Addictions Treatment

    a. If Referral for Addictions Treatment equals 1, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population for sub-measure SUB-3a. Stop processing.

    b. If Referral for Addictions Treatment equals 2, 3 or 5, continue processing and proceed to recheck Prescription for Alcohol or Drug Disorder Medication.

18. Recheck Prescription for Alcohol or Drug Disorder Medication

    a. If Prescription for Alcohol or Drug Disorder Medication equals 2 or 4, the case will proceed to a Measure Category Assignment of D and will be in the Measure Population for sub-measure SUB-3a. Stop processing.

    b. If Prescription for Alcohol or Drug Disorder Medication equals 1, the case will proceed to a Measure Category Assignment of E and will be in the Numerator Population for sub-measure SUB-3a. Stop processing.

Ambulatory Care (AMB)

SUMMARY OF CHANGES TO HEDIS 2020

- Retired the Medicare and commercial product lines.
- Removed "with or without a telehealth modifier" language; refer to *General Guideline 43*.
- Added a note to indicate that supplemental data may not be used for this measure.
- Added shading to the Data Elements for Reporting tables to indicate how data are reported.
- Added the *Rules for Allowable Adjustments* of HEDIS section.

Description

This measure summarizes utilization of ambulatory care in the following categories:

- Outpatient Visits including telehealth.
- ED Visits.

Calculations

Note: *Members in hospice are excluded from this measure. Refer to General Guideline 17: Members in Hospice.*

Product lines

Report the following tables for the Medicaid product line:

- Table AMB-1a Total Medicaid.
- Table AMB-1b Medicaid/Medicare Dual-Eligibles.
- Table AMB-1c Medicaid—Disabled.
- Table AMB-1d Medicaid—Other Low Income.

Member months

For each table, report all member months for the measurement year.. Refer to *Specific Instructions for Utilization Tables* for more information.

Counting multiple services

For combinations of multiple ambulatory services falling in different categories on the same day, report each service that meets the criteria in the appropriate category.

Outpatient visits including telehealth

Identify outpatient visits using any of the following.

- Outpatient visits (Ambulatory Outpatient Visits Value Set).
- Telephone visits (Telephone Visits Value Set).
- Online assessments (Online Assessments Value Set).

Count multiple codes with the same practitioner on the same date of service as a single visit. Count visits with different practitioners separately (count visits with different providers on the same date of service as different visits).

Report services without regard to practitioner type, training or licensing.

ED visits Count each visit to an ED once, regardless of the intensity or duration of the visit. Count multiple ED visits on the same date of service as one visit. Identify ED visits using either of the following:

- An ED visit (ED Value Set).
- A procedure code (ED Procedure Code Value Set) with an ED place of service code (ED POS Value Set).

Do not include ED visits that result in an inpatient stay (Inpatient Stay Value Set).

Exclusions *(required)*

The measure does not include mental health or chemical dependency services. Exclude visits for mental health or chemical dependency. Any of the following meet criteria:

- A principal diagnosis of mental health or chemical dependency (Mental and Behavioral Disorders Value Set).
- Psychiatry (Psychiatry Value Set).
- Electroconvulsive therapy (Electroconvulsive Therapy Value Set).

Note

- *This measure provides a reasonable proxy for professional ambulatory encounters. It is neither a strict accounting of all ambulatory resources nor an effort to be all-inclusive.*
- *Supplemental data may not be used for this measure.*

Table AMB-1: Ambulatory Care

Age	Member Months
<1	
1-9	
10-19	
20-44	
45-64	
65-74	
75-84	
85+	
Unknown	
Total	

	OUTPATIENT VISITS		ED VISITS	
Age	Visits	Visits/1,000 Member Months	Visits	Visits/1,000 Member Months
<1				
1-9				
10-19				
20-44				
45-64				
65-74				
75-84				
85+				
Unknown				
Total				

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Ambulatory Care

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	NA	There are no ages specified in this measure. Organizations can choose whether to apply age band criteria.
Continuous enrollment, Allowable gap, Anchor Date	NA	There are no continuous enrollment, Allowable gap or Anchor date requirements for this measure. Organizations are not required to calculate member months.
Benefits	NA	There are no required benefits for this measure.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	NA	There is no event/diagnosis for this measure.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Exclusions	No	Value sets and logic may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Ambulatory services	No	Value sets and logic may not be changed.

Surgical Site Infection (SSI) Event

Introduction: In 2014, a total of 14.2 millon operative procedures were performed in the inpatient setting in United States hospitals[1]. The CDC healthcare-associated infection (HAI) prevalence survey found that there were an estimated 157,500 surgical site infections (SSIs) associated with inpatient surgeries in 2011[2]. NHSN data included 16,147 SSIs following 849,659 operative procedures in all groups reported, for an overall SSI rate of 1.9% between 2006-2008[3]. A 17% decrease in SSI related to 10 select procedures was reported between 2008 and 2014[4].

While advances have been made in infection control practices, including improved operating room ventilation, sterilization methods, barriers, surgical technique, and availability of antimicrobial prophylaxis, SSIs remain a substantial cause of morbidity, prolonged hospitalization, and death. SSI is associated with a mortality rate of 3%, and 75% of SSI-associated deaths are directly attributable to the SSI[5]. SSI is the most costly HAI type with an estimated annual cost of $3.3 billion, and is associated with nearly 1 million additional inpatient-days annually[6,7].

Surveillance of SSI with feedback of appropriate data to surgeons has been shown to be an important component of strategies to reduce SSI risk[8-11]. A successful surveillance program includes the use of epidemiologically-sound infection definitions and effective surveillance methods, stratification of SSI rates according to risk factors associated with SSI development, and data feedback[9,10]. The most recent CDC and Healthcare Infection Control Practices Advisory Committee Guideline for the Prevention of Surgical Site Infection was published in 2017; this guideline provides evidence-based strategies for SSI prevention[11].

Settings: Surveillance of surgical patients will occur in any inpatient facility and/or hospital outpatient procedure department (HOPD) where the selected NHSN operative procedure(s) are performed.

Note: SSI surveillance in Ambulatory Surgery Centers (ASCs) should be performed using the Outpatient Procedure Component (OPC). The OPC replaces the use of the SSI protocol for ASCs.

Requirements:

- Perform surveillance for SSI following at least one NHSN operative procedure category (that is included in ICD-10-PCS and/or CPT NHSN operative procedure code mapping) as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).
- Collect SSI event (numerator) and operative procedure category (denominator) data on all procedures included in the selected operative procedure categories indicated on the facility's monthly reporting plan.
- A procedure must meet the NHSN definition of an operative procedure in order to be included in SSI surveillance. All procedures included in the NHSN monthly

surveillance plan are followed for superficial incisional, deep incisional, and organ/space SSI events and the type of SSI reported must reflect the deepest tissue level where SSI criteria is met during the surveillance period.
- An SSI event is attributed to the facility in which the NHSN operative procedure was performed.
- SSI events where infection present at the time of surgery (PATOS) = YES are reported to NHSN.

SSI monitoring requires active, patient-based, prospective surveillance. Concurrent and post-discharge surveillance methods should be used to detect SSIs following inpatient operative procedures and post-discharge surveillance for outpatient operative procedures.

Note: Ambulatory Surgery Centers (ASCs) please refer to the OPC protocol for guidance.

For example, these methods include:
- Review of medical records or surgery clinic patient records
    - Admission, readmission, ED, and OR logs
    - Patient charts for signs and symptoms of SSI
    - Lab, imaging, other diagnostic test reports
    - Clinician notes
    - ICD-10-CM Infection Diagnosis Codes to prompt further review
- Visit the ICU and wards – talk to primary care staff
- Surgeon surveys by mail or telephone
- Patient surveys by mail or telephone (though patients may have a difficult time assessing their infections).

Any combination of these methods is acceptable for use; however, NHSN criteria for SSI must be used. To minimize Infection Preventionists' (IPs) workload of collecting denominator data, operating room data may be downloaded.
(See file specifications at: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/ImportingProcedureData.pdf).

Operative Procedure Codes:

Operative procedure codes are used in health care settings as a way to communicate uniform information. This wide use of operative procedure codes allows NHSN to incorporate the operative procedure codes as a means to standardize NHSN SSI surveillance reporting. The operative procedure codes are required to determine the correct NHSN operative procedure category to be reported.

NHSN uses the following operative procedure coding systems:

- *International Classification of Diseases, 10th Revision Clinical Modifications/Procedure Coding System* (ICD-10-CM/PCS), as defined by the ICD-10 Coordination and Maintenance Committee of the National Center for Health Statistics and the Centers for Medicare and Medicaid Services (CMS).
- *Current Procedural Terminology* (CPT), as defined by the American Medical Association (AMA).

The mapping for ICD-10-PCS and CPT NHSN operative procedures is found in the "Supporting Materials" section of the SSI Protocol on the NHSN website. The mapping documents include a general definition for each NHSN operative procedure category as well as a description for each individual operative procedure code. Entering the operative procedure code into the NHSN application remains optional.

Note: The former NHSN Category "OTH - other" is not mapped to ICD-10-PCS and CPT NHSN operative procedure codes. An infection associated with a procedure that is not included in one of the NHSN operative procedure categories is not considered an NHSN SSI, although the infection may be investigated as a healthcare-associated infection.

Definition of an NHSN Operative Procedure:

An NHSN Operative Procedure is a procedure:

- that is included in the ICD-10-PCS and/or CPT NHSN operative procedure code mapping
  And
- takes place during an operation where at least one incision (including laparoscopic approach and cranial Burr holes) is made through the skin or mucous membrane, or reoperation via an incision that was left open during a prior operative procedure
  And
- takes place in an operating room (OR), defined as a patient care area that met the Facilities Guidelines Institute's (FGI) or American Institute of Architects' (AIA) criteria for an operating room when it was constructed or renovated[12]. This may include an operating room, C-section room, interventional radiology room, or a cardiac catheterization lab.

Exclusions: Otherwise eligible procedures that are assigned an ASA score of 6 are not eligible for NHSN SSI surveillance.

Note: Incisional closure method is NOT a part of the NHSN operative procedure definition; all otherwise eligible procedures are included, regardless of closure type. Therefore both primarily closed procedures and those that are not closed primarily should be entered into the

denominator data for procedures in the facility's monthly reporting plan. Any SSIs attributable to either primarily closed or non-primarily closed procedures should be reported.

SSI Event Details:

The Infection Window Period (IWP), Present on Admission (POA), Hospital Associated Infection (HAI), and Repeat Infection Timerame (RIT) definitions do not apply to the SSI protocol. For additional POA and PATOS details, see SSI Event Reporting Instructions #2 and #3.

Date of event (DOE): For an SSI, the date of event is the date when the first element used to meet the SSI infection criterion occurs for the first time during the SSI surveillance period. The date of event must fall within the SSI surveillance period to meet SSI criteria. The type of SSI (superficial incisional, deep incisional, or organ/space) reported and the date of event assigned must reflect the deepest tissue level where SSI criteria are met during the surveillance period. Synonym: infection date.

All elements required to meet an SSI criterion usually occur within a 7-10 day timeframe with no more than 2-3 days between elements. The elements must be relational to each other, meaning you should ensure the elements all associate to the SSI, and this can only happen if elements occur in a relatively tight timeframe. Each case differs based on the individual elements occurring and the type of SSI.

Secondary BSI Attribution Period for SSI: The secondary BSI attribution period for SSI is a 17-day period that includes the date of event, 3 days prior, and 13 days after. For detailed instructions on determining whether identification of organisms from a blood specimen represents a secondary BSI, refer to the Secondary BSI Guide (Appendix B of the BSI Event Protocol).

Denominator for Procedure Details:

Additional guidance can be found within the Instructions for Completion of Denominator for Procedure Form (CDC 57.121).

ASA physical status: Assessment by the anesthesiologist of the patient's preoperative physical condition using the American Society of Anesthesiologists' (ASA) Classification of Physical Status[13]. Patient is assigned an ASA score of 1-6 at time of surgery.

Note: Do NOT report procedures with an ASA physical status of 6 (a declared brain-dead patient whose organs are being removed for donor purposes) to NHSN.

Diabetes: The NHSN SSI surveillance definition of diabetes indicates that the patient has a diagnosis of diabetes requiring management with insulin or a non-insulin anti-diabetic agent. This includes:

- Patients with "insulin resistance" who are on management with anti-diabetic agents.
- Patients with gestational diabetes.
- Patients who are noncompliant with their diabetes medications.

The ICD-10-CM diagnosis codes that reflect the diagnosis of diabetes are also acceptable for use to answer YES to the diabetes field question on the denominator for procedure entry if they are documented during the admission where the procedure is performed. These codes are found on the NHSN website in the SSI section under "Supporting Materials".

The NHSN definition of diabetes excludes patients with no diagnosis of diabetes. The definition also excludes patients who receive insulin for perioperative control of hyperglycemia but have no diagnosis of diabetes.

Duration of operative procedure: The interval in hours and minutes between the Procedure/Surgery Start Time and the Procedure/Surgery Finish Time, as defined by the Association of Anesthesia Clinical Directors (AACD)[14]:

- Procedure/Surgery Start Time (PST): Time when the procedure is begun (for example, incision for a surgical procedure).
- Procedure/Surgery Finish (PF): Time when all instrument and sponge counts are completed and verified as correct, all postoperative radiologic studies to be done in the OR are completed, all dressings and drains are secured, and the physicians/surgeons have completed all procedure-related activities on the patient.

Emergency operative procedure: A procedure that is documented per the facility's protocol to be an Emergency or Urgent procedure.

General anesthesia: The administration of drugs or gases that enter the general circulation and affect the central nervous system to render the patient pain free, amnesic, unconscious, and often paralyzed with relaxed muscles. This does not include conscious sedation.

Height: The patient's most recent height documented in the medical record in feet (ft.) and inches (in.), or meters (m).

NHSN Inpatient Operative Procedure: An NHSN operative procedure performed on a patient whose date of admission to the healthcare facility and the date of discharge are different calendar days.

NHSN Outpatient Operative Procedure: An NHSN operative procedure performed on a patient whose date of admission to the healthcare facility and date of discharge are the same calendar day.

Non-primary Closure: The closure of the surgical wound in a way which leaves the skin level completely open following the surgery. Closure of any portion of the skin represents primary closure (see Primary Closure definition below). For surgeries with non-primary closure, the

deep tissue layers may be closed by some means (with the skin level left open), or the deep and superficial layers may both be left completely open. Wounds with non-primary closure may or may not be described as "packed" with gauze or other material, and may or may not be covered with plastic, "wound vacs," or other synthetic devices or materials.

Examples:

- Laparotomy in which the incision was closed to the level of the deep tissue layers, sometimes called "fascial layers" or "deep fascia," but the skin level was left open.
- The abdomen is left completely open after the surgery (an "open abdomen").

Primary Closure: The closure of the skin level during the original surgery, regardless of the presence of wires, wicks, drains, or other devices or objects extruding through the incision. This category includes surgeries where the skin is closed by some means. Thus, if any portion of the incision is closed at the skin level, by any manner, a designation of primary closure should be assigned to the surgery.

Note: If a procedure has multiple incision/laparoscopic trocar sites and any of the incisions are closed primarily then the procedure technique is recorded as primary closed.

Scope: An instrument used to visualize the interior of a body cavity or organ. In the context of an NHSN operative procedure, use of a scope involves creation of several small incisions to perform or assist in the performance of an operation rather than use of a traditional larger incision (specifically, open approach).

ICD-10-PCS codes can be helpful in answering this scope question. The fifth character indicates the approach to reach the procedure site:

ICD-10 5th Character	Approach	Scope Field
0	Open approach	No
4	Percutaneous endoscopic approach	Yes
F	Via natural or artificial opening with endoscopic assistance approach	Yes

Note: If a procedure is coded as ***open and scope*** then the procedure should be entered into NHSN as **Scope = NO**. The ***open*** designation is considered a higher risk procedure.

Trauma: Blunt or penetrating injury occurring prior to the start of the procedure. Complex trauma cases may require multiple trips to the OR during the same admission to repair the initial trauma. In such cases, trauma = Yes.

Weight: The patient's most recent weight documented in the medical record in pounds (lbs.) or kilograms (kg) prior to or otherwise closest to the procedure.

Wound class: An assessment of the degree of contamination of a surgical wound at the time of the operation. Wound class should be assigned by a person involved in the surgical procedure (for example, surgeon, circulating nurse, etc.). The wound class system used in NHSN is adapted from the American College of Surgeons wound classification schema. The four wound classifications available include Clean, Clean-Contaminated, Contaminated, and Dirty/Infected.

Based on feedback from external experts in the field of surgery, there are a group of NHSN procedures that can never be recorded as clean. These operative procedure categories are APPY, BILI, CHOL, COLO, REC, SB, and VHYS. Therefore, for these procedures in the application clean is not an option on the drop down menu.

All other operative procedure categories can be entered as clean procedures within the NHSN application. For example CSEC, HYST, or OVRY can be a clean wound class if documented as such.

Table 1. Surgical Site Infection Criteria

Criterion	Surgical Site Infection (SSI)
	Superficial incisional SSI Must meet the following criteria:
	Date of event occurs within 30 days after any NHSN operative procedure (where day 1 = the procedure date) **AND** involves only skin and subcutaneous tissue of the incision **AND** patient has at least ***one*** of the following: a. purulent drainage from the superficial incision. b. organism(s) identified from an aseptically-obtained specimen from the superficial incision or subcutaneous tissue by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (for example, not Active Surveillance Culture/Testing (ASC/AST)). c. superficial incision that is deliberately opened by a surgeon, attending physician* or other designee and culture or non-culture based testing of the superficial incision or subcutaneous tissue is not performed **AND** patient has at least one of the following signs or symptoms: localized pain or tenderness; localized swelling; erythema; or heat. d. diagnosis of a superficial incisional SSI by the surgeon, attending physician* or other designee. * The term attending physician for the purposes of application of the NHSN SSI criteria may be interpreted to mean the surgeon(s), infectious disease, other physician on the case, emergency physician, or physician's designee (nurse practitioner or physician's assistant).

	Superficial Incisional SSI
Comments	There are two specific types of superficial incisional SSIs: 1. Superficial Incisional Primary (SIP) – a superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions (for example, C-section incision or chest incision for CBGB) 2. Superficial Incisional Secondary (SIS) – a superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (for example, donor site incision for CBGB)
Reporting Instructions for Superficial SSI	**<u>The following do not qualify as criteria for meeting the NHSN definition of superficial incisional SSI:</u>** • Diagnosis/treatment of cellulitis (redness/warmth/swelling), by itself, does not meet criterion "d" for superficial incisional SSI. Conversely, an incision that is draining or that has organisms identified by culture or non-culture based testing is not considered a cellulitis. • A stitch abscess alone (minimal inflammation and discharge confined to the points of suture penetration). • Circumcision is not an NHSN operative procedure. An infected circumcision site in newborns is classified as CIRC and is not an SSI. • An infected burn wound is classified as BURN and is not an SSI. • For an NHSN operative procedure, a laparoscopic trocar site is considered a surgical incision and not a stab wound. • A localized stab wound or pin site infection is not considered an SSI; depending on the depth, these infections might be considered either a skin (SKIN) or soft tissue (ST) infection.

	Deep incisional SSI Must meet the following criteria:
	The date of event occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2 **AND** involves deep soft tissues of the incision (for example, fascial and muscle layers) **AND** patient has at least ***one*** of the following: a. purulent drainage from the deep incision. b. a deep incision that spontaneously dehisces, or is deliberately opened or aspirated by a surgeon, attending physician* or other designee **AND** organism(s) identified from the deep soft tissues of the incision by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (for example, not Active Surveillance Culture/Testing (ASC/AST)) or culture or non-culture based microbiologic testing method is not performed. A culture or non-culture based test from the deep soft tissues of the incision that has a negative finding does not meet this criterion. **AND** patient has at least ***one*** of the following signs or symptoms: fever (>38°C); localized pain or tenderness. c. an abscess or other evidence of infection involving the deep incision that is detected on gross anatomical or histopathologic exam, or imaging test. * The term attending physician for the purposes of application of the NHSN SSI criteria may be interpreted to mean the surgeon(s), infectious disease, other physician on the case, emergency physician, or physician's designee (nurse practitioner or physician's assistant).
Comments	There are two specific types of deep incisional SSIs: 1. Deep Incisional Primary (DIP) – a deep incisional SSI that is identified in a primary incision in a patient that has had an operation with one or more incisions (for example, C-section incision or chest incision for CBGB) 2. Deep Incisional Secondary (DIS) – a deep incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (for example, donor site incision for CBGB)

	Organ/Space SSI Must meet the following criteria:
	Date of event occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2 **AND** involves any part of the body deeper than the fascial/muscle layers that is opened or manipulated during the operative procedure **AND** patient has at least ***one*** of the following: a. purulent drainage from a drain that is placed into the organ/space (for example, closed suction drainage system, open drain, T-tube drain, CT-guided drainage). b. organism(s) identified from fluid or tissue in the organ/space by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (for example, not Active Surveillance Culture/Testing (ASC/AST)). c. an abscess or other evidence of infection involving the organ/space that is detected on gross anatomical or histopathologic exam, or imaging test evidence suggestive of infection. **AND** meets at least ***one*** criterion for a specific organ/space infection site listed in Table 3. These criteria are found in the Surveillance Definitions for Specific Types of Infections chapter.

Table 2. Surveillance Periods for SSI Following Selected NHSN Operative Procedure Categories. Day 1 = the date of the procedure.

30-day Surveillance			
Category	**Operative Procedure**	**Category**	**Operative Procedure**
AAA	Abdominal aortic aneurysm repair	LAM	Laminectomy
AMP	Limb amputation	LTP	Liver transplant
APPY	Appendix surgery	NECK	Neck surgery
AVSD	Shunt for dialysis	NEPH	Kidney surgery
BILI	Bile duct, liver or pancreatic surgery	OVRY	Ovarian surgery
CEA	Carotid endarterectomy	PRST	Prostate surgery
CHOL	Gallbladder surgery	REC	Rectal surgery
COLO	Colon surgery	SB	Small bowel surgery
CSEC	Cesarean section	SPLE	Spleen surgery
GAST	Gastric surgery	THOR	Thoracic surgery
HTP	Heart transplant	THYR	Thyroid and/or parathyroid surgery
HYST	Abdominal hysterectomy	VHYS	Vaginal hysterectomy
KTP	Kidney transplant	XLAP	Exploratory laparotomy
90-day Surveillance			
Category	**Operative Procedure**		
BRST	Breast surgery		
CARD	Cardiac surgery		
CBGB	Coronary artery bypass graft with both chest and donor site incisions		
CBGC	Coronary artery bypass graft with chest incision only		
CRAN	Craniotomy		
FUSN	Spinal fusion		
FX	Open reduction of fracture		
HER	Herniorrhaphy		
HPRO	Hip prosthesis		
KPRO	Knee prosthesis		
PACE	Pacemaker surgery		
PVBY	Peripheral vascular bypass surgery		
VSHN	Ventricular shunt		

Notes:
Superficial incisional SSIs are only followed for a 30-day period for all procedure types.

Secondary incisional SSIs are only followed for a 30-day period regardless of the surveillance period for the primary site.

Table 3. Specific Sites of an Organ/Space SSI.

Category	Specific Site	Category	Specific Site
BONE	Osteomyelitis	MED	Mediastinitis
BRST	Breast abscess or mastitis	MEN	Meningitis or ventriculitis
CARD	Myocarditis or pericarditis	ORAL	Oral cavity infection (mouth, tongue, or gums)
DISC	Disc space infection	OREP	Deep pelvic tissue infection or other infection of the male or female reproductive tract
EAR	Ear, mastoid infection	PJI	Periprosthetic joint infection
EMET	Endometritis	SA	Spinal abscess/infection
ENDO	Endocarditis	SINU	Sinusitis
GIT	Gastrointestinal (GI) tract infection	UR	Upper respiratory tract, pharyngitis, laryngitis, epiglottitis
IAB	Intraabdominal infection, not specified elsewhere	USI	Urinary System Infection
IC	Intracranial infection	VASC	Arterial or venous infection
JNT	Joint or bursa infection	VCUF	Vaginal cuff infection
LUNG	Other infection of the lower respiratory tract		

(Criteria for these sites can be found in the Surveillance Definitions for Specific Types of Infections chapter.)

Note: Appendix contains a list of all NHSN operative procedure categories and the site specific SSIs that may be attributable to each category.

SSI Numerator (SSI Event) Reporting

Numerator Data:
All patients having any of the procedures included in the selected NHSN operative procedure category(s) are monitored for SSI. The *Surgical Site Infection (SSI)* form is completed for each SSI. If no SSI events are identified during the surveillance month, check the "Report No Events" field in the Missing PA Events tab of the Incomplete/Missing List.

The Instructions for Completion of the Surgical Site Infection (CDC 57.120) form include brief instructions for collection and entry of each data element on the form. The SSI form includes patient demographic information and specific event details that pertain to the SSI event.

SSI Event Reporting Instructions:

1. **Excluded organisms:** Well-known community associated organisms (organisms belonging to the following genera: *Blastomyces, Histoplasma, Coccidioides, Paracoccidioides, Cryptococcus and Pneumocystis)* and/or organisms associated with latent infections (for example, herpes, shingles, syphilis, or tuberculosis) are excluded from meeting SSI criteria.

2. **Attributing SSI to an NHSN procedure when there is evidence of infection at the time of the primary surgery:** The Present on Admission (POA) definition does not apply to the SSI protocol. If evidence of infection is present at the time of the procedure and the patient meets the NHSN SSI criteria during the SSI surveillance period, an SSI is attributed to the procedure (see PATOS below). A high wound class is not an exclusion for a patient later meeting criteria for an SSI, but in most cases is included as a risk factor for SSI in risk modeling.

3. **Infection present at time of surgery (PATOS):** PATOS denotes that there is evidence of an infection or abscess at the start of or during the index surgical procedure (in other words, it is present preoperatively). PATOS is a YES/NO field on the SSI Event form. The evidence of infection or abscess must be noted/documented intraoperatively in an operative note or report of surgery. Only select PATOS = YES if it applies to the depth of SSI that is being attributed to the procedures (for example, if a patient has evidence of an intraabdominal infection at the time of surgery and then later returns with an organ/space SSI the PATOS field would be selected as a YES. If the patient returned with a superficial or deep incisional SSI the PATOS field would be selected as a NO). The patient does not have to meet the NHSN definition of an SSI at the time of the primary procedure, but there must be notation that there is evidence of an infection or abscess present at the time of surgery. PATOS is not necessarily diagnosis driven.

    - The use of the ending “itis” in an operative note/report does not necessarily meet PATOS, as it may only reflect inflammation which is not infectious in nature (for example, diverticulitis, peritonitis, and appendicitis).
    - Identification of an organism **alone** using culture or non-culture based microbiologic testing method or on a pathology report from a surgical specimen does not = PATOS (specifically, a positive culture/path report without surgical documentation of infection is not PATOS = YES).
    - The following verbiage **alone** without specific mention of infection does not meet the PATOS definition: colon perforation, necrosis, gangrene, fecal spillage, nicked bowel during procedure, or a note of inflammation.
    - Fresh trauma resulting in a contaminated case does not necessarily meet the PATOS requirement. For example, a fresh gunshot wound to the abdomen will

be a trauma case with a high wound class but there would not have been time for infection to develop.

- PATOS can be met when an abscess is noted, there is mention of infection in the OR note, purulence or pus is noted, or "feculent peritonitis" is noted, etc. An appendix that has ruptured will meet PATOS = YES, if the patient has a subsequent intraabdominal organ space SSI.

Examples:

1. Patient admitted with an acute abdomen. Sent to OR for an XLAP where there is a finding of an abscess due to ruptured appendix and an APPY is performed. Patient returns two weeks later and meets criteria for an organ/space IAB SSI. The PATOS field would be selected as YES on the SSI event since an abscess was noted at the time of surgery in the same level as the subsequent SSI.

2. Patient is admitted with a ruptured diverticulum. In the OR note the surgeon documents that there are multiple abscesses in the intraabdominal cavity. Patient returns three weeks later and meets criteria for a superficial SSI. The PATOS field would be selected as NO since there was no documentation of evidence of infection or abscess of the superficial area at the time of the procedure.

3. During an unplanned cesarean section (CSEC) the surgeon nicks the bowel and there is contamination of the intraabdominal cavity. One week later the patient returns and meets criteria for an organ/space OREP (other reproductive) SSI. The PATOS field would be selected as NO since there was no documentation of evidence of infection or abscess at the time of the CSEC. The colon nick was a complication but there was no infection present at the time of surgery.

4. Patient undergoes a foot amputation (AMP) due to "dry-gangrene" of the foot from chronic ischemia. There is no evidence of infection at the time of surgery. The word gangrene is not sufficient to qualify for infection. The patient returns two weeks later and has a superficial SSI. The PATOS field would be selected as NO since there was no documentation of evidence of infection or abscess at the time of the AMP.

Note: For more information about PATOS, see Quick Learn titled "Surgical Site Infections (SSI) Event Form for PATOS"

4. **Multiple tissue levels are involved in the infection:** The type of SSI (superficial incisional, deep incisional, or organ/space) reported must reflect the deepest tissue level where SSI criteria is met during the surveillance period.

    - Report infection that involves the organ/space as an organ/space SSI, whether or not it also involves the superficial or deep incision sites.

- Report infection that involves the superficial and deep incisional sites as a deep incisional SSI.
- If an SSI started as a deep incisional SSI on day 10 of the SSI surveillance period and then a week later (day 17 of the SSI surveillance period) meets criteria for an organ space SSI, the date of event would be the date of the organ/space SSI.

5. **Attributing SSI to a NHSN procedure when several are performed on different dates:** If a patient has several NHSN operative procedures performed on different dates prior to an infection, attribute the SSI to the operative procedure that was performed most closely in time prior to the infection date, unless there is evidence that the infection was associated with a different operation.

Note: For multiple NHSN operative procedures performed within a 24 hour period, see Denominator Reporting Instruction #9.

6. **Attributing SSI to NHSN procedures that involve multiple primary incision sites:** If multiple primary incision sites of the same NHSN operative procedure become infected, only report as a single SSI, and assign the type of SSI (superficial incisional, deep incisional, or organ/space) that represents the deepest tissue level where SSI criteria is met at any of the involved primary incision sites during the surveillance period. Examples:
    - If one laparoscopic incision meets criteria for a superficial incisional SSI and another meets criteria for a deep incisional SSI, only report one deep incisional SSI.
    - If one or more laparoscopic incision sites meet criteria for superficial incisional SSI but the patient also has an organ/space SSI related to the laparoscopic procedure, only report one organ/space SSI.
    - If an operative procedure is limited to a single breast and involves multiple incisions in that breast that become infected, only report a single SSI.
    - In a colostomy formation or reversal (take down) procedure, the stoma and other abdominal incision sites are considered primary incisions. If both the stoma and another abdominal incision site develop superficial incisional SSI, report only as one SSI (SIP).

7. **Attributing SSI to NHSN procedures that have secondary incision sites**: Certain procedures can involve secondary incisions (specifically the following, BRST, CBGB, CEA, FUSN, PVBY, REC, and VSHN). The surveillance period for all secondary incision sites is 30 days, regardless of the required deep incisional or organ/space SSI

surveillance period for the primary incision site(s) (Table 2). Procedures meeting this designation are reported as only one operative procedure. For example:

- A saphenous vein harvest incision site in a CBGB procedure is considered the secondary incision site. One CBGB procedure is reported, the saphenous vein harvest site is monitored for 30 days after surgery for SSI, and the chest incision is monitored for 90 days after surgery for SSI. If the patient develops an SSI of the leg site (such as a superficial incisional SSI) and an SSI of the chest site (such as a deep incisional SSI) two SSIs are reported.
- A tissue harvest site (for example, Transverse Rectus Abdominis Myocutaneous [TRAM] flap) in a BRST procedure is considered the secondary incision site. One BRST procedure is reported, and if the secondary incision site gets infected, report as either SIS or DIS as appropriate.

8. **SSI detected at another facility:** It is required that if an SSI is detected at a facility other than the one in which the operation was performed, the IP of the index facility will be provided with enough detail so the infection can be reported to NHSN. When reporting the SSI, the index facility should indicate that Detected = RO (Readmission to facility other than where procedure was performed).

9. **SSI attribution after multiple types of NHSN procedures are performed during a single trip to the OR:** If more than one NHSN operative procedure category was performed through a single incision/laparoscopic sites during a single trip to the operating room, attribute the SSI to the procedure that is thought to be associated with the infection. If it is not clear, as is often the case when the infection is an incisional SSI, use the NHSN Principal Operative Procedure Category Selection Lists (Table 4) to select the operative procedure to which the SSI should be attributed. For example, if a patient develops SSI after a single trip to the OR in which both a COLO and SB were performed, and the source of the SSI is not apparent, assign the SSI to the COLO procedure.

10. **SSI following invasive manipulation/accession of the operative site:** An SSI will not be attributed if the following 3 criteria are ALL met:

    - during the post-operative period the surgical site is without evidence of infection and,
    - an invasive manipulation/accession of the site is performed for diagnostic or therapeutic purposes (for example, needle aspiration, accession of ventricular shunts, accession of breast expanders) and,
    - an infection subsequently develops in a tissue level which was entered during the manipulation/accession.

Tissue levels that are BELOW the deepest entered level will be eligible for SSI. For example, a superficial debridement following a COLO procedure, where the muscle/fascia and organ/space was not entered, a subsequent organ/space SSI following the debridement may be an SSI attributable to the index COLO procedure. This reporting instruction does NOT apply to closed manipulation (for example, closed reduction of a dislocated hip after an orthopedic procedure). Invasive manipulation does not include wound packing, or changing of wound packing materials as part of postoperative care.

11. **Reporting instructions for post-operative infection scenarios:** An SSI that otherwise meets the NHSN definitions should be reported to NHSN without regard to post-operative accidents, falls, inappropriate showering or bathing practices, or other occurrences that may or may not be attributable to patients' intentional or unintentional postoperative actions. SSI should also be reported regardless of the presence of certain skin conditions (for example, dermatitis, blister, impetigo) that occur near an incision, and regardless of the possible occurrence of a "seeding" event from an unrelated procedure (for example, dental work). This instruction concerning various postoperative circumstances is necessary to reduce subjectivity and data collection burden.

Table 4. NHSN Principal Operative Procedure Category Selection List
(The categories with the highest risk of SSI are listed before those with lower risks.)

Priority	Category	Abdominal Operative Procedures
1	LTP	Liver transplant
2	COLO	Colon surgery
3	BILI	Bile duct, liver or pancreatic surgery
4	SB	Small bowel surgery
5	REC	Rectal surgery
6	KTP	Kidney transplant
7	GAST	Gastric surgery
8	AAA	Abdominal aortic aneurysm repair
9	HYST	Abdominal hysterectomy
10	CSEC	Cesarean section
11	XLAP	Laparotomy
12	APPY	Appendix surgery
13	HER	Herniorrhaphy
14	NEPH	Kidney surgery
15	VHYS	Vaginal hysterectomy
16	SPLE	Spleen surgery
17	CHOL	Gall bladder surgery
18	OVRY	Ovarian surgery
Priority	**Category**	**Thoracic Operative Procedures**
1	HTP	Heart transplant
2	CBGB	Coronary artery bypass graft with donor incision(s)
3	CBGC	Coronary artery bypass graft, chest incision only
4	CARD	Cardiac surgery
5	THOR	Thoracic surgery
Priority	**Category**	**Neurosurgical (Brain/Spine) Operative Procedures**
1	VSHN	Ventricular shunt
2	CRAN	Craniotomy
3	FUSN	Spinal fusion
4	LAM	Laminectomy
Priority	**Category**	**Neck Operative Procedures**
1	NECK	Neck surgery
2	THYR	Thyroid and or parathyroid surgery

SSI Denominator for Procedure Reporting

Denominator Data:
Denominator data are collected for each individual NHSN operative procedure category selected for monitoring on the *Patient Safety Monthly Reporting Plan*. For all patients having any of the procedures included in the NHSN operative procedure category(s) for which SSI surveillance is being performed during the month, complete the *Denominator for Procedure* form. An operative procedure code is required to determine the correct NHSN operative procedure category to be reported. The Instructions for Completion of the Denominator for Procedure form include brief instructions for collection and entry of each data element on the form.

Denominator Reporting Instructions:

1. **Closure type**: Incisional closure type does not exclude a procedure from SSI surveillance. All otherwise eligible procedures are included in the denominator reporting, regardless of closure type. The closure technique is entered for each denominator for procedure. If a procedure has multiple incision sites and any of the incisions are closed primarily then the procedure is entered as a primary closure.

   Note: If a patient returns to the OR within 24 hours of the end of the first procedure, assign the surgical wound closure that applies when the patient leaves the OR from the first operative procedure.

2. **Wound class**: A high wound class is not an exclusion for denominator reporting. If the procedure meets the definition of an NHSN operative procedure it should be reported in the denominator data regardless of wound class. NHSN will use the wound class for risk adjustment, as appropriate.

3. **Different operative procedure categories performed during same trip to the OR:** If procedures in more than one NHSN operative procedure category are performed during the same trip to the operating room through the same or different incisions, a *Denominator for Procedure* form is reported for each NHSN operative procedure category being monitored. For example, if a CARD and CBGC are done through the same incision, a *Denominator for Procedure* form is reported for each. In another example, if following a motor vehicle accident, a patient has an open reduction of fracture (FX) and splenectomy (SPLE) performed during the same trip to the operating room and both procedure categories are being monitored, complete a *Denominator for Procedure* form for each.

   EXCEPTION: If a patient has both a CBGC and CBGB during the same trip to the operating room, report only as a CBGB. Only report as a CBGC if there is only a chest incision. CBGB and CBGC are never reported for the same patient for the same trip to the operating room.

4. **Duration of the procedure when more than one category of NHSN operative procedure is performed through the same incision:** If more than one NHSN operative procedure category is performed through the same incision during the same trip to the operating room, record the combined duration of all procedures, which is the time from procedure/surgery start time to procedure/surgery finish time. For example, if a CBGC and a CARD are performed on a patient during the same trip to the operating room, the time from start time to finish time is reported for both operative procedures.

5. **Duration of operative procedures if patient has two different NHSN operative procedures performed via separate incisions on the same trip to the OR:** Try to determine the correct duration for each separate procedure (if this is documented); otherwise, take the time for both procedures and split it evenly between the two.

6. **Same operative procedure category but different ICD-10-PCS or CPT codes during same trip to the OR:** If procedures of different ICD-10-PCS or CPT codes from the same NHSN operative procedure category are performed through the same incision/laparoscopic sites, record only one procedure for that category. For example, a facility is performing surveillance for CARD procedures. A patient undergoes a replacement of both the mitral and tricuspid valves during the same trip to the operating room. Complete one CARD *Denominator for Procedure* form because both procedures are in the same operative procedure category (CARD).

7. **For revision HPRO and KPRO procedures:** If total or partial revision HPRO or KPRO is performed, determine if any of the ICD-10-PCS/CM diagnosis or procedure codes indicating infection (see link below) were assigned to the index joint in the 90 days prior to and including the index HPRO or KPRO revision. If any of the specified codes are assigned to the procedure, indicate on the denominator for procedure form that the revision was associated with 'prior infection at index joint' = YES. The 'prior infection at index joint' variable only applies to *revision* HPRO and KPRO. The cases designated 'prior infection at index joint' = YES should be validated before the procedure is submitted to NHSN. This validation is necessary to ensure the code is aligned with the index joint revision. The ICD-10-PCS/CM code mapping guidance is found on the NHSN website in the SSI section under "Supporting Materials."

8. **Same NHSN operative procedure via separate incisions:** For operative procedures that can be performed via separate incisions during same trip to operating room (specifically the following, AMP, BRST, CEA, FUSN, FX, HER, HPRO, KPRO, LAM, NEPH, OVRY, PVBY), separate *Denominator for Procedure* forms are completed. To document the duration of the procedures, indicate the procedure/surgery start time to procedure/surgery finish time for each procedure separately or, alternatively, take the total time for the procedures and split it evenly between procedures.

Notes:

- A COLO procedure with a colostomy formation is entered as one COLO procedure.
- Laparoscopic hernia repairs are considered one procedure, regardless of the number of hernias that are repaired in that trip to the OR. In most cases there will be only one incision time documented for this procedure. If more than one time is documented, total the durations. Open (specifically, non-laparoscopic) hernia repairs are reported as one procedure for each hernia repaired via a separate incision, (specifically, if two incisions are made to repair two defects, then two procedures will be reported). It is anticipated that separate incision times will be recorded for these procedures. If not, take the total time for both procedures and split it evenly between the two.

9. **More than one operative procedure through same incision within 24 hours:** When a patient has more than one operative procedure via the same incision and the second procedure start time is within 24 hours of the first procedure finish time, report only one *Denominator for Procedure* form for the original procedure, combining the durations for both procedures based on the procedure start times and finish times for both procedures. For example, a patient has a CBGB lasting 4 hours. He returns to the OR six hours later for another operative procedure via the same incision (for example, CARD). The second operation has duration of 1.5 hours. Record the operative procedure as one CBGB and the duration of operation as 5 hour 30 minutes. If the wound class has changed, report the higher wound class. If the ASA class has changed, report the higher ASA class. Do not report the CARD procedure in your denominator data.

   Note: When the patient returns to the OR within 24 hours of the end of the first procedure assign the surgical wound closure technique that applies when the patient leaves the OR from the first operative procedure.

10. **Patient expires in the OR:** If a patient expires in the operating room, do not complete a *Denominator for Procedure* form. This operative procedure is excluded from the denominator.

11. **HYST or VHYS:** For the purpose of NHSN SSI reporting, hysterectomy procedure codes that involve an incision made into the abdomen, including trocar insertion, are listed in the abdominal hysterectomy (HYST) category. The correct CPT hysterectomy procedure codes should be assigned by a medical record coder using current guidelines and conventions. Hysterectomy procedures should be designated as an HYST or VHYS, based on the approach of the procedure (5th character of the ICD-10 operative procedure code) that the facility's medical coder assigns to the hysterectomy procedure.

Procedure	ICD-10 5th Character	Approach
HYST	0	Open
	4	Percutaneous endoscopic
	F	Via natural or artificial opening with percutaneous endoscopic assistance
VHYS	7	Via natural or artificial opening
	8	Via natural or artificial opening with endoscopic

Data Analyses: The Standardized Infection Ratio (SIR) is calculated by dividing the number of observed infections by the number of predicted (expected) infections. The number of predicted infections is calculated using SSI probabilities estimated from multivariate logistic regression models constructed from NHSN data during a baseline time period, which represents a standard population's SSI experience[3]. The procedures/SSI occurring in adults are modeled separately from those occurring in pediatrics.

There are three main SSI SIR Models available from NHSN, each briefly described in the table below. The first two models, the All SSI SIR and the Complex A/R SSI SIR models, are available for all NHSN operative procedures/SSI occurring in both adults and pediatric patients, while the third model, the Complex 30-day SSI SIR is available for colon and abdominal hysterectomy procedures/SSI occurring in adults only.

Please see the NHSN SIR Guide for more model specific information:
https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf

All SSI SIR Model	• Includes separate models for inpatient and hospital outpatient procedures (under the 2015 baseline) • Includes Superficial, Deep & Organ/Space SSIs • Superficial & Deep incisional SSIs limited to primary incisional SSIs only • Includes SSIs identified on admission, readmission & via post-discharge surveillance
Complex A/R SSI Model	• Includes only Deep incisional primary SSIs & Organ/Space SSIs • Includes only SSIs identified on Admission/Readmission to facility where procedure was performed • Includes only inpatient procedures • Used for the HAI Progress Report, published annually by CDC
Complex 30-day SSI model (used for CMS IPPS)	• Includes only in-plan, inpatient COLO and HYST procedures in adult patients (specifically, ≥ 18 years of age) • Includes only deep incisional primary SSIs and organ/space SSIs with an event date within 30 days of the procedure • Includes SSIs identified on admission, readmission & via post-discharge surveillance • **Uses Diabetes, ASA score, gender, age, BMI, oncology hospital and closure technique to determine risk for COLO (under the 2015 baseline, BS2)** **Uses Diabetes, ASA score, age, BMI and oncology hospital to determine risk for HYST (under the 2015 baseline, BS2)** • **NOTE:** The Complex 30-day SSI model, under the 2006-2008 baseline, BS1, uses only age and ASA to determine risk for both COLO and HYST (BS1 applies to data up to 2016) • Used only for CMS IPPS reporting and for public reporting on Hospital Compare

While the SSI SIR can be calculated for single procedure categories and for specific surgeons, the measure also allows you to summarize your data across multiple procedure categories while adjusting for differences in the estimated probability of infection among the patients included across the procedure categories. For example, you will be able to obtain one SSI SIR adjusting for all procedures reported. Alternatively, you can obtain one SSI SIR for all COLO only within your facility.

Additional Notes about SSI SIRS:

1. **Rebaseline of NHSN data:** The new baseline, termed BS2, and updated risk-adjustments of HAI data using the 2015 NHSN data is available in the application as of January 2017. The new baseline can be applied to 2015 data and forward. The older baseline, termed BS1, which used the 2006-2008 NHSN data, will also be available in the application and may be applied to only the 2016 data and older.
2. **Closure technique:** All of the SSI SIRs that use the 2006-2008 SSI baseline data will include only those procedures that were reported with a primary closure method. All of the SSI SIRs that use the 2015 baseline data will include all procedures that were reported with primary or other than primary closure methods.
3. **Infection present at time of surgery (PATOS):** All of the SSI SIR reports that use the 2006-2008 SSI baseline will include SSIs that are reported as present at time of surgery. Meaning the PATOS event is included in the numerator of the SIR and the procedure from which the event occurred is included in the denominator of the SIR. All of the SSI SIR reports that use the new 2015 SSI baseline will exclude SSIs that are reported as present at time of surgery from both the numerator and denominator. Meaning the PATOS event is excluded in the numerator of the SIR and the procedure from which the event occurred is excluded in the denominator of the SIR.
4. **SIRs based on Procedure Date:** SSIs will be included in the numerator of an SIR based on the date of procedure, not the date of event. This is because the procedure carries the risk for the infection/SSI.
5. **Calculation of the SIR:** The SIR will be calculated only if the number of predicted HAIs ("numPred" in the NHSN application, previously known as the number of expected HAIs, "numExp") is ≥ 1 to help enforce a minimum precision criterion.

$$\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Predicted (P) HAIs}}$$

SSI rates per 100 operative procedures are calculated by dividing the number of SSIs by the number of specific operative procedures and multiplying the results by 100. SSIs will be included in the numerator of a rate based on the date of procedure, not the date of event. Using the advanced analysis feature of the NHSN application, SSI rate calculations can be performed separately for the different types of operative procedures and stratified by the basic risk index.

Descriptive analysis options of numerator and denominator data are available in the NHSN application, such as line listings, frequency tables, and bar and pie charts. SIRs and SSI rates and run charts are also available. Guides on using NHSN analysis features are available from: www.cdc.gov/nhsn/PS-Analysis-resources/reference-guides.html

APPENDIX. SSI specific event types attributed to each NHSN procedure category.

Operative Procedure Category	Specific Event Type
AAA - Abdominal aortic aneurysm repair	DIP - Deep Incisional Primary ENDO - Endocarditis GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary VASC - Arterial or venous infection
AMP - Limb amputation	BONE - Osteomyelitis DIP - Deep Incisional Primary JNT - Joint or bursa SIP - Superficial Incisional Primary
APPY - Appendix surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary
AVSD - AV shunt for dialysis	DIP - Deep Incisional Primary SIP - Superficial Incisional Primary VASC - Arterial or venous infection
BILI - Bile duct, liver or pancreatic surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary
BRST - Breast surgery	BRST - Breast abscess or mastitis DIP - Deep Incisional Primary DIS - Deep Incisional Secondary SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary
CARD - Cardiac surgery	BONE - Osteomyelitis CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract MED - Mediastinitis SIP - Superficial Incisional Primary VASC - Arterial or venous infection

Operative Procedure Category	Specific Event Type
CBGB - Coronary bypass with chest & donor incisions	BONE - Osteomyelitis CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary DIS - Deep Incisional Secondary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract MED - Mediastinitis SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary VASC - Arterial or venous infection
CBGC - Coronary bypass graft with chest incision	BONE - Osteomyelitis CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract MED - Mediastinitis SIP - Superficial Incisional Primary VASC - Arterial or venous infection
CEA - Carotid endarterectomy	DIP - Deep Incisional Primary DIS - Deep Incisional Secondary SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary VASC - Arterial or venous infection
CHOL - Gallbladder surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary
COLO - Colon surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
CRAN - Craniotomy	BONE - Osteomyelitis DIP - Deep Incisional Primary IC - Intracranial infection MEN - Meningitis or ventriculitis SINU - Sinusitis SIP - Superficial Incisional Primary

Operative Procedure Category	Specific Event Type
CSEC - Cesarean section	DIP - Deep Incisional Primary EMET - Endometritis GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
FUSN - Spinal fusion	BONE - Osteomyelitis DIP - Deep Incisional Primary DIS - Deep Incisional Secondary DISC - Disc space infection IAB - Intraabdominal, not specified elsewhere IC - Intracranial infection LUNG - Other infections of the lower respiratory tract MEN - Meningitis or ventriculitis SA - Spinal abscess/infection SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary
FX - Open reduction of fracture	BONE - Osteomyelitis DIP - Deep Incisional Primary JNT - Joint or bursa SIP - Superficial Incisional Primary
GAST - Gastric surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract SIP - Superficial Incisional Primary
HER - Herniorrhaphy	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary
HPRO - Hip prosthesis	BONE - Osteomyelitis DIP - Deep Incisional Primary PJI - Periprosthetic joint infection SIP - Superficial Incisional Primary

Operative Procedure Category	Specific Event Type
HTP - Heart transplant	BONE - Osteomyelitis CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract MED - Mediastinitis SIP - Superficial Incisional Primary VASC - Arterial or venous infection
HYST - Abdominal hysterectomy	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary VCUF - Vaginal cuff infection
KPRO - Knee prosthesis	BONE - Osteomyelitis DIP - Deep Incisional Primary PJI - Periprosthetic joint infection SIP - Superficial Incisional Primary
KTP - Kidney transplant	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection VASC - Arterial or venous infection
LAM - Laminectomy	BONE - Osteomyelitis DIP - Deep Incisional Primary DISC - Disc space infection IAB - Intraabdominal, not specified elsewhere IC - Intracranial infection MEN - Meningitis or ventriculitis SA - Spinal abscess/infection SIP - Superficial Incisional Primary
LTP - Liver transplant	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary VASC - Arterial or venous infection

Operative Procedure Category	Specific Event Type
NECK - Neck surgery	DIP - Deep Incisional Primary EAR - Ear, mastoid infection ORAL - Oral cavity infection (mouth, tongue, or gums) SIP - Superficial Incisional Primary UR - Upper respiratory tract infection, pharyngitis, laryngitis, epiglottitis
NEPH - Kidney surgery	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
OVRY - Ovarian surgery	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
PACE - Pacemaker surgery	CARD - Myocarditis or pericarditis DIP - Deep Incisional Primary ENDO - Endocarditis IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary VASC - Arterial or venous infection
PRST - Prostate surgery	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
PVBY - Peripheral vascular bypass surgery	DIP - Deep Incisional Primary DIS - Deep Incisional Secondary SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary VASC - Arterial or venous infection
REC - Rectal surgery	DIP - Deep Incisional Primary DIS - Deep Incisional Secondary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary USI - Urinary System Infection

Operative Procedure Category	Specific Event Type
SB - Small bowel surgery	DIP - Deep Incisional Primary GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection
SPLE - Spleen surgery	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere SIP - Superficial Incisional Primary
THOR - Thoracic surgery	BONE - Osteomyelitis BRST - Breast abscess or mastitis DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere LUNG - Other infections of the lower respiratory tract SIP - Superficial Incisional Primary
THYR - Thyroid and/or parathyroid surgery	DIP - Deep Incisional Primary EAR - Ear, mastoid infection GIT - Gastrointestinal tract SIP - Superficial Incisional Primary UR - Upper respiratory tract infection, pharyngitis, laryngitis, epiglottitis
VHYS - Vaginal hysterectomy	DIP - Deep Incisional Primary IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection VCUF - Vaginal cuff infection
VSHN - Ventricular shunt	BONE - Osteomyelitis DIP - Deep Incisional Primary DIS - Deep Incisional Secondary IAB - Intraabdominal, not specified elsewhere IC - Intracranial infection LUNG – Other infections of the lower respiratory tract MEN - Meningitis or ventriculitis SA - Spinal abscess/infection SIP - Superficial Incisional Primary SIS - Superficial Incisional Secondary

Operative Procedure Category	Specific Event Type
XLAP - Exploratory laparotomy	DIP - Deep Incisional Primary EMET - Endometritis GIT - Gastrointestinal tract IAB - Intraabdominal, not specified elsewhere OREP - Deep pelvic tissue infection or other infection of the male or female reproductive tract SIP - Superficial Incisional Primary USI - Urinary System Infection

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Behavioral Health Risk Assessment

Section 1. Basic Measure Information

1.A. Measure Name

Behavioral Health Risk Assessment

1.B. Measure Number

0085

1.C. Measure Description

Please provide a non-technical description of the measure that conveys what it measures to a broad audience.

Percentage of patients, regardless of age, who gave birth during a 12-month period seen at least once for prenatal care who received a behavioral health screening risk assessment that includes the following screenings at the first prenatal visit: screening for depression, alcohol use, tobacco use, drug use, and intimate partner violence.

This measure was developed by the American Medical Association (AMA)-convened Physician Consortium for Performance Improvement® (PCPI), which is a key member of the Pediatric Measurement Center of Excellence (PMCoE) consortium. The PMCoE is funded by the Agency for Healthcare Research and Quality (AHRQ) and includes the following consortium members: American Academy of Pediatrics; American Board of Pediatrics; American Board of Medical Specialties; Northwestern University; Truven Health Analytics (formerly Thomson Reuters); Children's Hospital and Health System, Milwaukee; Medical College of Wisconsin; and the AMA.

1.D. Measure Owner

AMA-convened Physician Consortium for Performance Improvement® (PCPI™) is the measure owner. The AMA has copyright on the measure set.

1.E. National Quality Forum (NQF) ID (if applicable)

n/a

1.F. Measure Hierarchy

Please note here if the measure is part of a measure hierarchy or is part of a measure group or composite measure. The following definitions are used by AHRQ's National Quality Measures Clearinghouse and are available at http://www.qualitymeasures.ahrq.gov/about/hierarchy.aspx :

1. **Please identify the name of the collection of measures to which the measure belongs (if applicable). A collection is the highest possible level of the measure hierarchy. A collection may contain one or more sets, subsets, composites, and/or individual measures.**

   None

2. **Please identify the name of the measure set to which the measure belongs (if applicable). A set is the second level of the hierarchy. A set may include one or more subsets, composites, and/or individual measures.**

   Prenatal/Perinatal Performance Measurement Set

3. **Please identify the name of the subset to which the measure belongs (if applicable). A subset is the third level of the hierarchy. A subset may include one or more composites, and/or individual measures.**

   None

4. **Please identify the name of the composite measure to which the measure belongs (if applicable). A composite is a measure with a score that is an aggregate of scores from other measures. A composite may include one or more other composites and/or individual measures. Composites may comprise component measures that can or cannot be used on their own.**

   Not applicable.

1.G. Numerator Statement

Patients who received the following behavioral health screening risk assessments at the first prenatal visit:

Depression screening

Patients who were screened for depression at the first visit: Questions may be asked either directly by a health care provider or in the form of self-completed paper- or computer-administered questionnaires. Results should be documented in the medical record. Depression screening may include a self-reported validated depression screening tool (e.g., Patient Health

Questionnaire-2 [PHQ-2], Beck Depression Inventory, Beck Depression Inventory for Primary Care, Edinburgh Postnatal Depression Scale [EPDS]).

Alcohol use screening

Patients who were screened for any alcohol use at the first visit.

Tobacco use screening

Patients who were screened for tobacco use at the first visit.

Drug use (illicit and prescription, over the counter) screening

Patients who were screened for any drug use at the first visit.

Intimate partner violence screening

Patients who were screened for intimate partner violence/abuse at the first visit: Questions may be asked either directly by a health care provider or in the form of self-completed paper- or computer-administered questionnaires. Results should be documented in the medical record. Intimate partner violence screening may include a self-reported validated depression screening tool (e.g., Hurt, Insult, Threaten, and Scream [HITS], Woman Abuse Screening Tool [WAST], Partner Violence Screen [PVS], Abuse Assessment Screen [AAS]).

To satisfactorily meet the numerator – ALL screening components must be performed.

1.H. Numerator Exclusions

None.

1.I. Denominator Statement

All patients, regardless of age, who gave birth during a 12-month period seen at least once for prenatal care.

1.J. Denominator Exclusions

None

1.K. Data Sources

Check all the data sources for which the measure is specified and tested.

Electronic Medical Record

If other, please list all other data sources in the field below.

Section 2: Detailed Measure Specifications

Provide sufficient detail to describe how a measure would be calculated from the recommended data sources, uploading a separate document (+ Upload attachment) or a link to a URL. Examples of detailed measure specifications can be found in the CHIPRA Initial Core Set Technical Specifications Manual 2011 published by the Centers for Medicare & Medicaid Services. Although submission of formal programming code or algorithms that demonstrate how a measure would be calculated from a query of an appropriate electronic data source are not requested at this time, the availability of these resources may be a factor in determining whether a measure can be recommended for use.

Please see attachments for full eSpecifications and coding spreadsheets. Below is an overview of our technical specifications process.

The PMCoE Cener of Excellence adopted the PCPI specification process, which places emphasis on developing comprehensive measure specifications for electronic health records (EHRs) and provides relevant clinical data on patients and actionable feedback to providers. There are several data sources available for collecting performance measures; generally, different data sources require different sets of measure specifications, due to the structure of the systems storing the data. The PCPI recognizes that EHRs are the state of the art for clinical encounters and is focusing significant resources and expertise toward specifying and testing measures within EHRs, as they hold promise for supplying relevant clinical data for measures and providing feedback to physicians and other health care providers that is timely and actionable.

The type of specifications developed for this measurement set are aligned with the PCPI approach to focus on the development of EHR specifications for new measure development projects. While the PCPI values prospective claims reporting programs and the data these programs can provide, the PCPI is looking to leverage the data in EHRs. This new focus will align the PCPI with national initiatives that highlight the benefits and wealth of data that EHRs bring to health care.

The measure specifications attached with this submission form include the following components: (1) a text description of the measure; (2) the data requirements table, which outlines the data elements that are required for the measure, including the identification of the clinical vocabularies applicable to a given data element, the NQF Quality Data Model category and State, as well as the timing parameters for each data element; (3) a visual flow diagram that uses boolean logic to identify the initial patient population, exclusions, denominator, numerator, and exceptions included in the measure; (4) measure calculation; and (5) value sets for each of the data elements.

The measure specification provides the required information to collect the data needed to calculate the quality measure. The AMA-PCPI, through PMCoE, will make full measure

specifications for the measure available for public use in accordance with the terms detailed in the Notice of Grant Award. Please see the attached written statement from AMA-PCPI and PMCoE.

Section 3. Importance of the Measure

In the following sections, provide brief descriptions of how the measure meets one or more of the following criteria for measure importance (general importance, importance to Medicaid and/or CHIP, complements or enhances an existing measure). Include references related to specific points made in your narrative (not a free-form listing of citations).

3.A. Evidence for General Importance of the Measure

Provide evidence for all applicable aspects of general importance:

- **Addresses a known or suspected quality gap and/or disparity in quality (e.g., addresses a socioeconomic disparity, a racial/ethnic disparity, a disparity for Children with Special Health Care Needs (CSHCN), a disparity for limited English proficient (LEP) populations).**
- **Potential for quality improvement (i.e., there are effective approaches to reducing the quality gap or disparity in quality).**
- **Prevalence of condition among children under age 21 and/or among pregnant women**
- **Severity of condition and burden of condition on children, family, and society (unrelated to cost)**
- **Fiscal burden of measure focus (e.g., clinical condition) on patients, families, public and private payers, or society more generally, currently and over the life span of the child.**
- **Association of measure topic with children's future health – for example, a measure addressing childhood obesity may have implications for the subsequent development of cardiovascular diseases.**
- **The extent to which the measure is applicable to changes across developmental stages (e.g., infancy, early childhood, middle childhood, adolescence, young adulthood).**

This measure was developed by the AMA-PCPI, which is a key member of the Pediatric Measurement Center of Excellence (PMCoE) consortium. The AMA-convened Physician Consortium for Performance Improvement® (PCPI™) is a national, physician-led initiative dedicated to improving patient health and safety through the identification and development of evidence-based clinical performance measures and measurement resources that enhance the

quality of patient care and foster accountability. The PCPI is nationally recognized for measure development, specification and testing of measures, and enabling use of measures in EHRs. The PCPI's measure development resources include a measure testing protocol, a position statement on the evidence base required for measure development, a composite framework, specification and categorization of measure exceptions, and an outcomes measure framework. The PCPI is made up of over 170 member organizations and individuals, including national medical specialty societies, State medical societies, health care professional organizations, Federal agencies, individual members, and other groups interested in improving the quality of health care. Today, the PCPI portfolio includes measures in more than 46 clinical areas with over 280 individual measures.

Currently, there is a quality gap among pregnant women receiving appropriate screenings for depression, drug and alcohol use, smoking, and violence at prenatal visits. Without appropriate screening, it is difficult to assess the number of women who are risk during pregnancy and are putting their babies at risk. This is an important area of focus for measurement and provides a significant area for quality improvement that has implications for mothers, babies, and providers, such as pediatricians.

Clinical depression is common among reproductive-age women and is the leading cause of disability in U.S. women each year. Between 14 and 23 percent of pregnant women will experience depression symptoms during pregnancy, and an estimated 5 to 25 percent of women will have postpartum depression. Studies have shown that untreated maternal depression negatively affects an infant's cognitive, neurologic, and motor skill development. A mother's untreated depression can also negatively impact older children's mental health and behavior. During pregnancy, depression can lead to preeclampsia, preterm delivery, and low birth weight (ACOG, 2010).

In 2002, the U.S. Preventive Services Task Force reviewed evidence about the accuracy of screening instruments in identifying depressed adults. There is little evidence to recommend one screening method over another; therefore, clinicians may choose the method most consistent with their personal preference, the patient population being served, and the practice setting (USPSTF, 2009). Alcohol and substance abuse in pregnant women have been linked to a variety of adverse outcomes for both the mother and her newborn. Besides birth-related, short-term adverse effects, substance use during pregnancy also can lead to long-term developmental problems in the child. Screening pregnant women for alcohol use has become increasingly important because new research indicates that even low levels of prenatal alcohol exposure can negatively affect the developing fetus. Adverse effects of prenatal alcohol exposure can range from subtle developmental problems, or fetal alcohol effects, to full-blown fetal alcohol syndrome. In addition, certain neurobehavioral outcomes associated with prenatal alcohol exposure can persist in the affected person into adolescence (Sampson et al. 1994) and adulthood (Kelly et al. 2000). According to new studies, even low levels of prenatal alcohol exposure can negatively affect the developing fetus, thereby increasing the importance of identifying women who drink during pregnancy. In response, researchers have developed several simple alcohol screening instruments for use with pregnant women. These instruments, which can be administered quickly and easily, have been evaluated and found to be effective. Because of the potential adverse consequences of prenatal alcohol exposure, short screening questionnaires are

worthwhile preventive measures when combined with appropriate followup. Women abused during pregnancy are more likely to be depressed, suicidal, and experience pregnancy complications and poor outcomes, including maternal and fetal death.

American College of Obstetricians of and Gynecologists (ACOG). Committee Opinion No. 453. Screening for depression during and after pregnancy. Obstest Gynecol 2010; 115: 394-5.

Kelly SJ, Day N, Streissguth AP. Effects of prenatal alcohol exposure on social behavior in humans and other species. Neurotoxicol Teratol 2000; 22(2):143-9.

Sampson PD, Bookstein FL, Barr HM, et al. Prenatal alcohol exposure, birthweight, and measures of child size from birth to age 14 years. Am J Public Health 1994; 84(9):1421-8.

U.S. Preventive Services Task Force. Screening for Depression. Rockville, MD: Agency for Healthcare Research and Quality; 2009. Available at http://www.ahrq.gov/professionals/prevention-chronic-care/healthier-pregnancy/preventive/depression.html. Accessed November 4, 2015.

3.B. Evidence for Importance of the Measure to Medicaid and/or CHIP

Comment on any specific features of this measure important to Medicaid and/or CHIP that are in addition to the evidence of importance described above, including the following:

- **The extent to which the measure is understood to be sensitive to changes in Medicaid or CHIP (e.g., policy changes, quality improvement strategies).**

- **Relevance to the Early and Periodic Screening, Diagnostic and Treatment benefit in Medicaid (EPSDT).**

- **Any other specific relevance to Medicaid/CHIP (please specify).**

This measure would fill a gap in the Medicaid and CHIP programs core set of children's health care quality measures aimed at providing services and treatment to promote healthy birth and prevent premature birth. The measure will provide a mechanism to help identify patients with drug, alcohol, or smoking problems, as well as depression and abuse, which may help prevent adverse neonatal outcomes. Women abused during pregnancy are more likely to be depressed, suicidal, and experience pregnancy complications and poor outcomes, including maternal and fetal death. This measure is of particular importance for CHIPRA in that it is high impact with Medicaid patients and addresses concerns related to both mother and baby.

We encourage the use of this measure by physicians, other health care professionals, and health care systems or health plans where appropriate. This clinical performance measure is designed for practitioner and/or system level quality improvement to achieve better outcomes for maternity care patients and their babies.

3.C. Relationship to Other Measures (if any)

Describe, if known, how this measure complements or improves on an existing measure in this topic area for the child or adult population, or if it is intended to fill a specific gap in an existing measure category or topic. For example, the proposed measure may enhance an existing measure in the initial core set, it may lower the age range for an existing adult-focused measure, or it may fill a gap in measurement (e.g., for asthma care quality, inpatient care measures).

Currently, there are no measures that assess pregnant women for depression, alcohol and drug use, tobacco use, and intimate partner violence. We believe that there is a quality gap in screening and followup for women at risk, particularly those in the Medicaid population.

Section 4. Measure Categories

CHIPRA legislation requires that measures in the initial and improved core set, taken together, cover all settings, services, and topics of health care relevant to children. Moreover, the legislation requires the core set to address the needs of children across all ages, including services to promote healthy birth. Regardless of the eventual use of the measure, we are interested in knowing all settings, services, measure topics, and populations that this measure addresses. These categories are not exclusive of one another, so please indicate "Yes" to all that apply.

Does the measure address this category?

a. **Care Setting – ambulatory :** yes
b. **Care Setting – inpatient :** no
c. **Care Setting – other – please specify :** no
d. **Service – preventive health, including services to promote healthy birth :** yes
e. **Service – care for acute conditions :** no
f. **Service – care for children with acute conditions :** no
g. **Service – other (please specify) :** no
h. **Measure Topic – duration of enrollment :** no
i. **Measure Topic – clinical quality :** yes
j. **Measure Topic – patient safety :** yes
k. **Measure Topic – family experience with care :** no
l. **Measure Topic – care in the most integrated setting:** no
m. **Measure Topic other (please specify) :** no
n. **Population – pregnant women :** yes
o. **Population – neonates (28 days after birth) (specify age range) :** no
p. **Population – infants (29 days to 1 year) (specify age range) :** no
q. **Population – pre-school age children (1 year through 5 years) (specify age range) :** no
r. **Population – school-aged children (6 years through 10 years) (specify age range) :** no
s. **Population – adolescents (11 years through 20 years) (specify age range) :** no
t. **Population – other (specify age range) :** no

u. Other category (please specify) :

Section 5. Evidence or Other Justification for the Focus of the Measure

The evidence base for the focus of the measures will be made explicit and transparent as part of the public release of CHIPRA deliberations; thus, it is critical for submitters to specify the scientific evidence or other basis for the focus of the measure in the following sections.

5.A. Research Evidence

Research evidence should include a brief description of the evidence base for valid relationship(s) among the structure, process, and/or outcome of health care that is the focus of the measure. For example, evidence exists for the relationship between immunizing a child or adolescent (process of care) and improved outcomes for the child and the public. If sufficient evidence existed for the use of immunization registries in practice or at the State level and the provision of immunizations to children and adolescents, such evidence would support the focus of a measure on immunization registries (a structural measure).

Describe the nature of the evidence, including study design, and provide relevant citations for statements made. Evidence may include rigorous systematic reviews of research literature and high-quality research studies.

Evidence Behind the measure: The evidence behind smoking, drug use, and alcohol use during pregnancy and its link to increased risk of adverse outcomes for mothers and babies includes clinical practice guidelines and numerous published research studies.

Clinical Evidence Base Available for Measure: Evidence-based clinical practice guidelines that were reviewed for this project:

- American College of Obstetricians and Gynecologists.
- American Academy of Family Physicians.
- Centers for Disease Control.
- United States Preventive Services Task Force.
- Veterans Administration/Department of Defense Clinical Practice Guideline for Pregnancy Management.
- Society of Obstetricians and Gynecologists of Canada.

Numerous research studies have assessed the lack of screening for depression and alcohol and substance use among pregnant women. A 2003 report demonstrated the prevalence of depressive symptomatology during pregnancy when seen in obstetric settings, the extent of treatment in this population, and specific risk factors associated with mood symptoms in pregnancy. A total of 3,472 pregnant women age 18 and older were screened while waiting for their prenatal care visits in 10 obstetric clinics using a brief (10 minute) screening questionnaire. This screen measured demographics, tobacco and alcohol (TWEAK problem alcohol use screening measure), and depression measures, including the Center for Epidemiological Studies-Depression scale (CES-D), use of antidepressant medications, past history of depression, and current treatment (i.e., medications, psychotherapy, or counseling) for depression. Of those women screened, 20 percent (n = 689) scored above the cutoff score on the CES-D, and only 13.8 percent of those women reported receiving any formal treatment for depression. Past history of depression, poorer overall health, greater alcohol use consequences, smoking, being unmarried, unemployment, and lower educational attainment were significantly associated with symptoms of depression during pregnancy. These data show that a substantial number of pregnant women screened in obstetric settings have significant symptoms of depression, and most of them are not being monitored in treatment. As elevations in depressive symptomatology have been associated with adverse maternal and infant outcomes, further study of the impact of psychiatric treatment in gravid women is essential.

The U.S. Preventive Services Task Force reviewed evidence about the accuracy of screening instruments in identifying depressed adults in 2002. Many formal screening tools are available, including instruments designed specifically for older adults. There is little evidence to recommend one screening method over another; therefore, clinicians may choose the method most consistent with their personal preference, the patient population being served, and the practice setting. (USPSTF, 2009)

By integrating routine screening and treatment for substance use, including alcohol and cigarette smoking, into the prenatal care system, the health outcomes of mothers and their babies can be significantly improved, according to a retrospective study conducted by a large U.S. health care organization. The study examined the records of nearly 50,000 pregnant women who went through the prenatal substance use screening between 1999 and 2003. They found that women who were screened positive, assessed by the specialist, and treated for substance use had significantly better birth-related outcomes than those who screened positive but turned down assessments and/or treatment by the Early Start specialist. The birth-related benefits were seen in both the mothers and the newborns. The risk of having a preterm delivery, placental abruption, and intrauterine fetal death (stillbirth) were all significantly reduced. The babies born to mothers who underwent the Early Start program had lower risks of requiring neonatal-assisted ventilation and having low birthweight. Of the women included in the study, 2,073 were positive for alcohol, smoking, or substance use at screening and received an assessment and at least one followup appointment with a specialist; 1,203 were screened positive, assessed by the specialist, and declined a followup appointment; and 156 were screened positive but received neither assessment nor followup. The other 46,000 women who had negative results at screening served as the control group.

The workgroup reviewed multiple evidence-based clinical practice guidelines for supporting evidence for this measure. The following guideline statements were used as a basis for this measure.

Depression Screening

- A social and mental health history should be completed on all new prenatal patients.

- Routine depression screening is recommended for all patients in clinical practices that have systems in place to assure effective diagnosis, treatment, and followup.

Depression Screening Weeks 6-8, 28 (Veterans Administration/Department of Defense Clinical Practice Guideline for Pregnancy Management, 2009)

- Women should be screened for depression during their first contact with obstetric health care services, at week 28, and at the postpartum visit.

- Depression screening should be performed using a standardized screening tool, such as the Edinburgh Postnatal Depression Scale (EDPS) or the PHQ-2.

- Women should be asked early in pregnancy if they have had any previous psychiatric illnesses. If they have a past history of serious psychiatric disorder, they should be referred for a psychiatric assessment during the antenatal period (USPSTF, 2009).

- All positive screening tests should trigger full diagnostic interviews that use standard diagnostic criteria to determine the presence or absence of specific depressive disorders, such as major depressive disorder (MDD) or dysthymia.

- The severity of depression and co-morbid psychological problems (for example, anxiety, panic attacks, or substance abuse) should be addressed.

Alcohol and Drug Use Screening

The USPSTF strongly recommends (B Recommendation) screening and behavioral counseling interventions to reduce alcohol misuse by adults, including pregnant women, in primary care settings (USPSTF, 2004).

The USPSTF strongly recommends (A Recommendation) that clinicians screen all adults for tobacco use and provide tobacco cessation interventions for those who use tobacco products. (USPSTF, 2003)

Intimate Partner Violence Screening

The Society of Obstetricians and Gynaecologists of Canada recommends (SOCG, 2005):

1. Providers should include queries about violence in the behavioral health assessment of new patients, at annual preventive visits, as a part of prenatal care, and in response to symptoms or conditions associated with abuse (B).

B: There is fair evidence to support the recommendation for use of a diagnostic test, treatment, or intervention.

Summary statement

1. At least three systematic reviews of "screening" for intimate partner violence (IPV) have found insufficient evidence to recommend for or against routine screening. Asking women about violence is not a screening intervention: victims are not asymptomatic; disclosure is not a test result, it is a voluntary act, and the presence or absence of violence is not under the victim's control; and most interventions required to protect and support survivors are societal, not medical.(I).

I: Evidence obtained from at least one properly designed randomized controlled trial.

American College of Obstetricians and Gynecologists, 2012.

Obstetrician–gynecologists are in the unique position to provide assistance for women who experience IPV because of the nature of the patient–physician relationship and the many opportunities for intervention that occur during the course of annual examinations, family planning, pregnancy, and followup visits for ongoing care. (Not rated)

Screening all patients at various times is also important because some women do not disclose abuse the first time they are asked. Health care providers should screen all women for IPV at periodic intervals, such as annual examinations and new patient visits. Signs of depression, substance abuse, mental health problems, requests for repeat pregnancy tests when the patient does not wish to be pregnant, new or recurrent sexually transmitted infections (STIs), asking to be tested for an STI, or expressing fear when negotiating condom use with a partner should prompt an assessment for IPV. (Not rated)

Screening for IPV during obstetric care should occur at the first prenatal visit, at least once per trimester, and at the postpartum checkup. (Not rated)

Goler NC , Armstrong MA, Taillac CJ, et al. Substance abuse treatment linked with prenatal visits improves perinatal outcomes: a new standard. J Perinatol. 2008;28:597-603. doi:10.1038/jp.2008.70.

Institute for Clinical Systems Improvement (ICSI). Major Depression in Adults in Primary Care. Bloomington, MN: Institute for Clinical Systems Improvement (ICSI); May 2008.

5.B. Clinical or Other Rationale Supporting the Focus of the Measure (optional)

Provide documentation of the clinical or other rationale for the focus of this measure, including citations as appropriate and available.

Section 6. Scientific Soundness of the Measure

Explain the methods used to determine the scientific soundness of the measure itself. Include results of all tests of validity and reliability, including description(s) of the study sample(s) and methods used to arrive at the results. Note how characteristics of other data systems, data sources, or eligible populations may affect reliability and validity.

6.A. Reliability

Reliability of the measure is the extent to which the measure results are reproducible when conditions remain the same. The method for establishing the reliability of a measure will depend on the type of measure, data source, and other factors.

Explain your rationale for selecting the methods you have chosen, show how you used the methods chosen, and provide information on the results (e.g., the Kappa statistic). Provide appropriate citations to justify methods.

Analytic Method

The study sample for reliability testing is being derived from an urban, tertiary-care hospital with an EHR system integrating inpatient and outpatient data. The EHR system is certified for the Medicare and Medicaid EHR Incentive Programs. Data being used in the analysis are from a patient population of 12,108 for 2010. We are carrying out an assessment of measure reliability applying a reliability coefficient in the form of the signal to noise ratio (SNR). In SNR analysis, reliability is the measure of confidence in differentiating performance between physicians and other providers (Adams et al, 2010; Physician Cost Profiling, 2010; Scholle et al, 2008). The signal is the variability in measured performance that can be explained by real differences in physician performance, and the noise is the total variability in measured performance. Reliability is then the ratio of the physician-to-physician variance to the sum of the physician-to-physician variance plus the error variance specific to a physician:

Reliability = Variance (physician-to-physician) / [Variance (physician-to-physician) + Variance (physician-specific-error]

Reliability equal to zero implies that all the variability in a measure is attributable to measurement error. Reliability equal to 1.0 implies that all the variability is attributable to real differences in physician performance. Reliability of 0.70 is generally considered a minimum threshold for reliability, and 0.80 is considered very good reliability (Nunnelly et al, 1994).

The SNR reliability testing is being performed using a beta-binomial model. The beta-binomial model assumes the physician performance score is a binomial random variable conditional on the

physician's true value that comes from the beta distribution. The beta distribution is usually defined by two parameters, alpha and beta. Alpha and beta can be thought of as intermediate calculations to get to the needed variance estimates.

Reliability can be estimated at different points. The convention is to estimate reliability at two points: (1) at a minimum number of quality reporting events per physician and (2) at the average number of quality reporting events per physician. We set the minimum number required as 10 events. Limiting the reliability analysis to only those physicians with a minimum number of events reduces the bias introduced by the inclusion of physicians without a significant number of events. Reliability testing results from SNR analysis have been included in support of AMA-PCPI measures submitted for NQF endorsement (NQF, 2012).

The SNR reliability testing for this measure is underway. We are currently producing the automated report from the EHR and will be completing reliability testing analysis when those data become available. We expect to have reliability testing and performance results prior to the SNAC meeting in September. The analysis will provide results on measure reliability, overall measure performance, the distribution of performance rates, and performance stratified by patient race, ethnicity, preferred language, socioeconomic status, and demographic variables. The structure of the results is the same as that included in our submission of the PMCoE/AMA-PCPI c-section and episiotomy measures.

A second phase of reliability testing on the measure also is ongoing at the same sites where feasibility testing was conducted. This approach utilizes parallel forms reliability where measure data elements and performance from an automated report from the EHR are compared to those data from a manual review of the EHR—that is, comparison to the gold standard. (See Measure Testing Protocol for PCPI Performance Measures, ama-assn.org/resources/doc/cqi/pcpi-testing-protocol.pdf.)

Adams JL, Mehrotra A, McGlynn EA. Estimating Reliability and Misclassification in Physician Profiling, Santa Monica, CA: RAND Corporation, 2010. Available at http://www.rand.org/pubs/technical_reports/TR863. Accessed November 4, 2015.

NQF Removes Time-Limited Endorsement for 13 Measures; Measures Now Have Endorsed Status. Washington, DC: National Quality Forum; 2012. Available at http://www.qualityforum.org/News_And_Resources/Press_Releases/2012/NQF_Removes_Time-Limited_Endorsement_for_13_Measures;_Measures_Now_Have_Endorsed_Status.aspx. Accessed November 4, 2015.

Nunnelly J, Bernstein I. Psychometric Theory. 3rd ed. New York, NY: McGraw-Hill; 1994.

Physician cost profiling--reliability and risk of misclassification. N Engl J Med. 2010 Mar 18;362(11):1014-21. http://www.nejm.org/doi/pdf/10.1056/NEJMsa0906323.

Scholle SH, Roski J, Adams JL, et al. Benchmarking physician performance: reliability of individual and composite measures. Am J Manag Care. 2008, 14:833-838. Available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2667340/pdf/nihms-99203.pdf.

6.B. Validity

Validity of the measure is the extent to which the measure meaningfully represents the concept being evaluated. The method for establishing the validity of a measure will depend on the type of measure, data source, and other factors.

Explain your rationale for selecting the methods you have chosen, show how you used the methods chosen, and provide information on the results (e.g., R2 for concurrent validity).

The measure was assessed for content validity and face validity. Evidence of content validity is provided by looking for agreement among subject matter experts. The performance measure was assessed for content validity by a panel of expert workgroup members during the development process. This subject matter expert panel consisted of 24 members, with representation from measure methodologists, patient advocacy groups, and the following clinical specialties: anesthesiology, family practice, geriatric medicine, maternal fetal medicine, neonatology, nurse midwife, obstetrics and gynecology, and perinatal nursing. Additional input on the content validity of draft measures was obtained through a 30-day public comment period and also by soliciting comments from a panel of consumer, purchaser, and patient representatives convened by the PCPI specifically for this purpose. All comments received were reviewed by the expert workgroup, and the measures were adjusted as needed. Other external review groups (e.g., focus groups) may be convened if there are any remaining concerns related to the content validity of the measures.

The expert panel members also assessed the measure face validity through an online survey. The survey introduction provided the following definition of face validity: Face validity is the extent to which an empirical measurement appears to reflect that which it is supposed to "at face value." Face validity of an individual measure poses the question of how well the definition and specifications of an individual measure appear to capture the single aspect of care or health care quality as intended. The expert panel was asked to rate their agreement with the following statement: The scores obtained from the measure as specified will accurately differentiate quality across providers. A 5-point Likert scale was used in the survey (1=Strongly Disagree; 2=Disagree; 3=Neither Disagree nor Agree; 4 = Agree 5=Strongly Agree).

The survey results show that for the Behavioral Health Risk Assessment measure, the mean score was 4.46; 84.6 percent (11/13) of respondents agree or strongly agree that the scores obtained from the measure as specified will accurately differentiate quality across providers; and no respondents disagree or strongly disagree that the scores obtained from the measure as specified will accurately differentiate quality across providers.

Section 7. Identification of Disparities

CHIPRA requires that quality measures be able to identify disparities by race, ethnicity, socioeconomic status, and special health care needs. Thus, we strongly encourage

nominators to have tested measures in diverse populations. Such testing provides evidence for assessing measure's performance for disparities identification. In the sections below, describe the results of efforts to demonstrate the capacity of this measure to produce results that can be stratified by the characteristics noted and retain the scientific soundness (reliability and validity) within and across the relevant subgroups.

7.A. Race/Ethnicity

We include race and ethnicity as a Supplemental Data Element to collect for each measure to allow for the stratification of measure results by these variables to assess disparities and initiate subsequent quality improvement activities, consistent with recent national efforts to standardize the collection of race and ethnicity data. We have included these variables as recommended data elements to be collected in the measure specifications.

The Centers for Disease Control and Prevention (CDC) value sets for race and ethnicity are referenced in the measure specifications to collect race and ethnicity information, which is the requirement for race and ethnicity outlined in the Centers for Medicare & Medicaid Services (CMS) Blueprint.

Also see Section 8.B.1 and Section 8.B.2

7.B. Special Health Care Needs

Not applicable for this measure.

7.C. Socioeconomic Status

We include payer as a Supplemental Data Element to collect for each measure to allow for the stratification of measure results by this variable to assess disparities and initiate subsequent quality improvement activities.

The Payment Typology value set is referenced in the measure specifications to collect payer information, which is the requirement for payer outlined the CMS Blueprint.

Also see Section 8.B.1 and Section 8.B.2

7.D. Rurality/Urbanicity

Future measure testing and implementation will collect data on the location of the patient and provider populations in order to stratify performance and test for variation by location.

7.E. Limited English Proficiency (LEP) Populations

We include preferred language as a Supplemental Data Element to collect for each measure to allow for the stratification of measure results by this variable to assess disparities and initiate subsequent quality improvement activities.

The CDC value set is referenced in the measure specifications to collect preferred language information, which is the requirement for preferred language outlined in the CMS Blueprint.

Also see Section 8.B.1 and Section 8.B.2.

Section 8. Feasibility

Feasibility is the extent to which the data required for the measure are readily available, retrievable without undue burden, and can be implemented for performance measurement. Using the following sections, explain the methods used to determine the feasibility of implementing the measure.

8.A. Data Availability

1. What is the availability of data in existing data systems? How readily are the data available?

Data Element Tool

The PMCoE Cener of Excellence adopted the AMA-PCPI testing methodology which uses the Data Element Table (DET)© Tool[a] to assess the availability of the data and the technical feasibility and implementation feasibility of the measures. The DET is an Excel workbook designed to capture information that will determine whether or not it is feasible for each site to collect the data for the measures. It is structured to collect metadata about each data element necessary to construct each measure stored in the EHR. It will also collect information related to integrity and validity of data collection. Specifically, the DET is designed to capture the following information:

- *Data element information*: Whether or not the data element is captured in the EHR, the data source application, primary user interface data location, data type, coding system, unit of measure, frequency of collection, and calculability within the measure context.

- *Measure integrity information*: An assessment by the testing site as to what degree the measure, as specified, retains the originally stated intention of the measure.

[a] Data Element Table Tool: copyright 2013, American Medical Association. All rights reserved. This tool and the information contained therein may not be reproduced or distributed and may only be used for collecting data in connection with an agreement with the American Medical Association. This tool is provided "as is" without warranty of any kind.

- *Measure validity information*: An assessment by the testing site as to what degree the scores obtained from the measure, as specified, will accurately differentiate quality performance across providers.

The DETs collected responses used to assess technical and implementation feasibility for each measure. Measure technical feasibility was defined as "Can my EHR do this?" and measure implementation feasibility was defined as "Will workflow be used consistently?" The responses were captured in the form of a rating using the following responses:

- "Feasible. Can do today."
- "Feasible with workflow mod/changes to EHR."
- "Non-feasible. Unable to do today."

This information was entered from drop-down options pertaining to the specific criteria and in free text fields for questions related to specific workflow and EHR configurations. The free text fields and specific narrative questions provide qualitative feedback from the sites which can be factored into the overall feasibility grade for the measure.

The DET is completed by staff at each testing site. After the completion of the DET by the testing sites, a determination can be made as to which of the measures are relevant for each specific site. For some sites, all of the measures in the Perinatal/Prenatal Measurement Set may be collected, for others it may be only a few.

Once the completed DET was submitted by the test site, the PMCoE project team conducted quality assurance (QA) of the DETs to ensure the data were complete and ready for analysis. A series of analyses were subsequently performed in order to characterize the feasibility, integrity, and face validity of the measures being tested.

Feasibility testing was conducted at an urban, tertiary care hospital.

All nine of the data elements can be captured in code or text format.

2. If data are not available in existing data systems or would be better collected from future data systems, what is the potential for modifying current data systems or creating new data systems to enhance the feasibility of the measure and facilitate implementation?

Measure Technical Feasibility and Implementation Feasibility
The measure technical feasibility assessment determined how many of the total measure data elements are feasible data elements. A "feasible data element" is one which can be captured by the test site EHR system. The sites assessed technical feasibility for the measure based on the following rating scale:

- "Feasible. Can do today."
- "Feasible with workflow mod/changes to EHR."

- "Nonfeasible. Unable to do today."

The sites also used this scale to assess measure implementation feasibility. Implementation feasibility represents the site's ability to implement the measure using current workflows and EHRs and addresses issues of projected data reliability related to the consistency with which providers document and capture the data elements needed to implement the measure.

The technical feasibility and implementation feasibility were rated the same for each of the measures. For example, if the technical feasibility of a measure was rated as "Feasible. Can do today," its implementation feasibility was also rated as "Feasible. Can do today."

The test site rated the technical and implementation feasibility of the measure as "Nonfeasible. Unable to do today." The site reported that the data for this measure is not being captured in their inpatient HER, and that they do not know whether the data is captured reliably in the outpatient record. Unavailability of the data in an inpatient EHR would not affect feasibility, however, since the measure is specified for ambulatory care settings. The site indicated that making the measure feasible would require a change in outpatient documentation.

8.B. Lessons from Use of the Measure

1. Describe the extent to which the measure has been used or is in use, including the types of settings in which it has been used, and purposes for which it has been used.

The development of the measure was completed in a short time; earlier this year; hence there was limited opportunity to have the measure adopted and implemented. Feasibility and reliability testing of the measures have been conducted in EHRs in a variety of settings—including an urban, tertiary care hospital; an urban, public hospital; and a suburban community hospital—and provide a description of data collection methods and insights into lessons learned. See results presented in Section 6.A. Reliability and Section 8. Feasibility.

2. If the measure has been used or is in use, what methods, if any, have already been used to collect data for this measure?

N/A

3. What lessons are available from the current or prior use of the measure?

N/A

Section 9. Levels of Aggregation

CHIPRA states that data used in quality measures must be collected and reported in a standard format that permits comparison (at minimum) at State, health plan, and provider levels. Use the following table to provide information about this measure's use for reporting at the levels of aggregation in the table.

For the purpose of this section, please refer to the definitions for provider, practice site, medical group, and network in the Glossary of Terms.

If there is no information about whether the measure could be meaningfully reported at a specific level of aggregation, please write "Not available" in the text field before progressing to the next section.

Level of aggregation (Unit) for reporting on the quality of care for children covered by Medicaid/ CHIP:

State level; Can compare States

Intended use: **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes

Data Sources: **Are data sources available to support reporting at this level?**
No

Sample Size: **What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?**
This information is not available.

In Use: **Have measure results been reported at this level previously?**
No

Reliability & Validity: **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No

Unintended consequences: **What are the potential unintended consequences of reporting at this level of aggregation?**
This information is not available.

Other geographic level: Can compare other geographic regions (e.g., MSA, HRR)

Intended use: **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes

Data Sources: **Are data sources available to support reporting at this level?**
No

Sample Size: **What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?**
This information is not available.

In Use: **Have measure results been reported at this level previously?**
No

Reliability & Validity: **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No

Unintended consequences: **What are the potential unintended consequences of reporting at this level of aggregation?**
This information is not available.

Medicaid or CHIP Payment model: Can compare payment models (e.g., managed care, primary care case management, FFS, and other models)

Intended use: **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes

Data Sources: **Are data sources available to support reporting at this level?**
No

Sample Size: **What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?**
This information is not available.

In Use: **Have measure results been reported at this level previously?**
No

Reliability & Validity: **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No

Unintended consequences: **What are the potential unintended consequences of reporting at this level of aggregation?**
This information is not available.

Health plan: Can compare quality of care among health plans.

Intended use: **Is measure intended to support meaningful comparisons at this level? (Yes/No)**

Yes

Data Sources: **Are data sources available to support reporting at this level?**
No

Sample Size: **What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?**
This information is not available.

In Use: **Have measure results been reported at this level previously?**
No

Reliability & Validity: **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No

Unintended consequences: **What are the potential unintended consequences of reporting at this level of aggregation?**
This information is not available.

Provider Level
Individual practitioner: Can compare individual health care professionals

Intended use: **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes

Data Sources: **Are data sources available to support reporting at this level?**
Yes

Sample Size: **What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?**
This information is not available.

In Use: **Have measure results been reported at this level previously?**
No

Reliability & Validity: **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No

Unintended consequences: **What are the potential unintended consequences of reporting at this level of aggregation?**
This information is not available.

Provider Level
Hospital: Can compare hospitals

Intended use: **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes

Data Sources: **Are data sources available to support reporting at this level?**
No

Sample Size: **What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?**
This information is not available.

In Use: **Have measure results been reported at this level previously?**
No

Reliability & Validity: **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No

Unintended consequences: **What are the potential unintended consequences of reporting at this level of aggregation?**
This information is not available.

Provider Level
Practice, group, or facility:** Can compare: (i) practice sites; (ii) medical or other professional groups; or (iii) integrated or other delivery networks

Intended use: **Is measure intended to support meaningful comparisons at this level? (Yes/No)**
Yes

Data Sources: **Are data sources available to support reporting at this level?**
Yes

Sample Size: **What is the typical sample size available for each unit at this level? What proportion of units at this level of aggregation can achieve an acceptable minimum sample size?**
This information is not available.

In Use: **Have measure results been reported at this level previously?**
No

Reliability & Validity: **Is there published evidence about the reliability and validity of the measure when reported at this level of aggregation?**
No

Unintended consequences: **What are the potential unintended consequences of reporting at this level of aggregation?**
This information is not available.

Section 10. Understandability

CHIPRA states that the core set should allow purchasers, families, and health care providers to understand the quality of care for children. Please describe the usefulness of this measure toward achieving this goal. Describe efforts to assess the understandability of this measure (e.g., focus group testing with stakeholders).

The AMA-PCPI has worked collaboratively on this measure set with the AMA-PCPI-Consumer Purchaser Panel (CPP), which comprised representatives from the patient, consumer, and purchaser communities. The panel strongly supports this measure addressing pertinent issues of behavioral health and applauds the inclusion of it at the level of the individual clinician. The CPP states this important measure can help to identify at-risk patients and provide treatment and followup during and after pregnancy. In addition, the work group included member representatives from consumer groups, patient advocacy groups, and a health plan.

Section 11. Health Information Technology

Please respond to the following questions in terms of any health information technology (health IT) that has been or could be incorporated into the measure calculation.

11.A. Health IT Enhancement

Please describe how health IT may enhance the use of this measure.

The use of health IT in the collection and calculation of this measure allows for the clinical data to be used to assess measure results. The use of clinical data is more desirable compared to administrative data due to the increased granularity of information that can be collected.

11.B. Health IT Testing

Has the measure been tested as part of an electronic health record (EHR) or other health IT system?

Yes

If so, in what health IT system was it tested and what were the results of testing?

A second phase of reliability testing on the measure also is ongoing at the same sites where feasibility testing was conducted. This approach utilizes parallel forms of reliability where measure data elements and performance from an automated report from the EHR are compared to those data from a manual review of the EHR—that is, comparison to the gold standard. (See Measure Testing Protocol for PCPI Performance Measures, ama-assn.org/resources/doc/cqi/pcpi-testing-protocol.pdf.)

11.C. Health IT Workflow

Please describe how the information needed to calculate the measure may be captured as part of routine clinical or administrative workflow.

See Section 8.A/Issues in Implementation for workflow discussion.

11.D. Health IT Standards

Are the data elements in this measure supported explicitly by the Office of the National Coordinator for Health IT Standards and Certification criteria (see healthit.hhs.gov/portal/server.pt/community/healthit_hhs_gov__standards_ifr/1195)?

Yes

If yes, please describe.

We use the following standards in the development of our EHR specifications: The Quality Data Model (QDM), developed by the NQF, the vocabulary recommendations named by the Health IT Standards Committee (of the Office of the National Coordinator for Health IT), (e.g., SNOMED, RxNorm, LOINC), and also referenced in the CMS Blueprint. The vocabulary standards used in the specifications are consistent with those recommendations proposed for Stage II of the CMS EHR incentive program (Meaningful Use). Another available standard is the HL7 Health Quality Measure Format (HQMF), an XML-based structured document to express a quality measure specification. The HQMF is used for specifications included in the Meaningful Use program and also references the QDM. The specifications provided with this submission form have not been incorporated into the HQMF eMeasure format, however the information included in the specifications serve as the foundation for the HQMF—that is, the PCPI electronic specification outlines the requirements to develop the HQMF.

11.E. Health IT Calculation

Please assess the likelihood that missing or ambiguous information will lead to calculation errors.

It is highly likely that missing data or ambiguous information stored in the EHR will lead to calculation errors. The specifications provided for this measure are designed to query the EHR in order to obtain the data required for the measure calculation.

11.F. Health IT Other Functions

If the measure is implemented in an EHR or other health IT system, how might implementation of other health IT functions (e.g., computerized decision support systems in an EHR) enhance performance characteristics on the measure?

These health IT functions could make measure recording in the EHR more feasible and reliable, as well as improve performance on the measure and patient outcomes. For example, computerized decision support with menu drop downs or reminders could be programmed to give providers prompts to provide patients the appropriate services.

Section 12. Limitations of the Measure

Describe any limitations of the measure related to the attributes included in this CPCF (i.e., availability of measure specifications, importance of the measure, evidence for the focus of the measure, scientific soundness of the measure, identification of disparities, feasibility, levels of aggregation, understandability, health information technology).

The measure may have limited utilization due to the limited adoption of EHRs, particularly among practices treating the Medicaid population. However, the vocabulary standards used in the specifications are as proposed for Stage II of the CMS EHR incentive program (Meaningful Use), so its usability is expected to be enhanced by increased participation in this program. As adoption of EHRs increases, utilization of this measure should also increase.

Section 13. Summary Statement

Provide a summary rationale for why the measure should be selected for use, taking into account a balance among desirable attributes and limitations of the measure. Highlight specific advantages that this measure has over alternative measures on the same topic that were considered by the measure developer or specific advantages that this measure has over existing measures. If there is any information about this measure that is important for the review process but has not been addressed above, include it here.

This measure should be selected because it expands the core set of measures beyond their current use. The measure will provide a mechanism to help assess the appropriateness of deliveries and prevent adverse neonatal outcomes. This measure is of particular importance for CHIPRA in that it is high impact with Medicaid patients and addresses concerns related to both mother and baby. Additionally, since this measure has full eSpecifications, it can be a candidate for future inclusion in the EHR Incentive Program for Meaningful Use.

Our EHR specifications follow the standards in the Quality Data Model (QDM), developed by the NQF, the vocabulary recommendations named by the Health IT Standards Committee (of the Office of the National Coordinator for Health IT), (e.g., SNOMED, RxNorm, LOINC), and also referenced in the CMS Blueprint. The vocabulary standards used in the specifications are a part of Stage II of the CMS EHR incentive program (Meaningful Use).

Section 14: Identifying Information for the Measure Submitter

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Last Name: Sachdeva MD, PhD, MBA, FAAP

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The CHIPRA Pediatric Quality Measures Program (PQMP) Candidate Measure Submission Form (CPCF) was approved by the Office of Management and Budget (OMB) in accordance with the Paperwork Reduction Act.

The OMB Control Number is 0935-0205 and the Expiration Date is December 31, 2015.

Public Disclosure Requirements

Each submission must include a written statement agreeing that, should U.S. Department of Health and Human Services accept the measure for the 2014 and/or 2015 Improved Core Measure Sets, full measure specifications for the accepted measure will be subject to public disclosure (e.g., on the Agency for Healthcare Research and Quality [AHRQ] and/or Centers for Medicare & Medicaid Services [CMS] websites), except that potential measure users will not be permitted to use the measure for commercial use. In addition, AHRQ expects that measures and full measure specifications will be made reasonably available to all interested parties. "Full measure specifications" is defined as all information that any potential measure implementer will need to use and analyze the measure, including use and analysis within an electronic health record or other health information technology. As used herein, "commercial use" refers to any sale, license or distribution of a measure for

commercial gain, or incorporation of a measure into any product or service that is sold, licensed or distributed for commercial gain, even if there is no actual charge for inclusion of the measure. This statement must be signed by an individual authorized to act for any holder of copyright on each submitted measure or instrument. The authority of the signatory to provide such authorization should be described in the letter.

The signed written statement was submitted

AHRQ Pub. No. 14(16)-P009-8-EF
December 2015

Breast Cancer Screening (BCS)

SUMMARY OF CHANGES TO HEDIS 2020

- Modified value sets to make them compatible with digital measure formatting.
- Updated value sets used to identify advanced illness.
- Deleted value set combinations for unilateral mastectomy where laterality (bilateral, left, right) is not specified.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of women 50–74 years of age who had a mammogram to screen for breast cancer.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product lines Commercial, Medicaid, Medicare (report each product line separately).

Stratification For only Medicare, report the following SES stratifications and total:

- Non-LIS/DE, Nondisability.
- LIS/DE.
- Disability.
- LIS/DE and Disability.
- Other.
- Unknown.
- Total Medicare.

Note: *The stratifications are mutually exclusive, and the sum of all six stratifications is the Total population.*

Ages Women 52–74 years as of December 31 of the measurement year.

Continuous enrollment October 1 two years prior to the measurement year through December 31 of the measurement year.

Allowable gap No more than one gap in enrollment of up to 45 days for each full calendar year of continuous enrollment (i.e., the measurement year and the year prior to the measurement year). To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage during each year of continuous enrollment.

No gaps in enrollment are allowed from October 1 two years prior to the measurement year through December 31 two years prior to the measurement year.

Anchor date December 31 of the measurement year.

Benefit Medical.

Event/diagnosis None.

Exclusions Exclude members who meet any of the following criteria:

Note: *Supplemental and medical record data may not be used for these exclusions.*

- Medicare members 66 years of age and older as of December 31 of the measurement year who meet either of the following:
  - Enrolled in an Institutional SNP (I-SNP) any time during the measurement year.
  - Living long-term in an institution any time during the measurement year as identified by the LTI flag in the Monthly Membership Detail Data File. Use the run date of the file to determine if a member had an LTI flag during the measurement year.
- Members 66 years of age and older as of December 31 of the measurement year (all product lines) with frailty ***and*** advanced illness. Members must meet ***BOTH*** of the following frailty and advanced illness criteria to be excluded:
  1. At least one claim/encounter for frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) during the measurement year.
  2. Any of the following during the measurement year or the year prior to the measurement year (count services that occur over both years):
     - At least two outpatient visits (Outpatient Value Set), observation visits (Observation Value Set), ED visits (ED Value Set), nonacute inpatient encounters (Nonacute Inpatient Value Set) or nonacute inpatient discharges (instructions below; the diagnosis must be on the discharge claim) on different dates of service, with an advanced illness diagnosis (Advanced Illness Value Set). Visit type need not be the same for the two visits. To identify a nonacute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
       2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim.
       3. Identify the discharge date for the stay.
     - At least one acute inpatient encounter (Acute Inpatient Value Set) with an advanced illness diagnosis (Advanced Illness Value Set).
     - At least one acute inpatient discharge with an advanced illness diagnosis (Advanced Illness Value Set) on the discharge claim. To identify an acute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
       2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
       3. Identify the discharge date for the stay.
     - A dispensed dementia medication (Dementia Medications List).

Dementia Medications

Description	Prescription
Cholinesterase inhibitors	• Donepezil • Galantamine • Rivastigmine
Miscellaneous central nervous system agents	• Memantine

Administrative Specification

Denominator The eligible population.

Numerator One or more mammograms (Mammography Value Set) any time on or between October 1 two years prior to the measurement year and December 31 of the measurement year.

Exclusion *(optional)*

Bilateral mastectomy any time during the member's history through December 31 of the measurement year. Any of the following meet criteria for bilateral mastectomy:

- Bilateral mastectomy (Bilateral Mastectomy Value Set).
- Unilateral mastectomy (Unilateral Mastectomy Value Set) with a bilateral modifier (Bilateral Modifier Value Set).
- Unilateral mastectomy found in clinical data (Clinical Unilateral Mastectomy Value Set) with a bilateral modifier (Clinical Bilateral Modifier Value Set).
  Note: *The "clinical" mastectomy value sets identify mastectomy; the word "clinical" refers to the data source, not to the type of mastectomy.*
- History of bilateral mastectomy (History of Bilateral Mastectomy Value Set).
- Any combination of codes from the table below that indicate a mastectomy on ***both*** the left ***and*** right side on the same or different dates of service.

Left Mastectomy (any of the following)	Right Mastectomy (any of the following)
• Unilateral mastectomy (Unilateral Mastectomy Value Set) ***with*** a left-side modifier (Left Modifier Value Set) (same procedure)	• Unilateral mastectomy (Unilateral Mastectomy Value Set) ***with*** a right-side modifier (Right Modifier Value Set) (same procedure)
• Unilateral mastectomy found in clinical data (Clinical Unilateral Mastectomy Value Set) ***with*** a left-side modifier (Clinical Left Modifier Value Set) (same procedure)	• Unilateral mastectomy found in clinical data (Clinical Unilateral Mastectomy Value Set) ***with*** a right-side modifier (Clinical Right Modifier Value Set) (same procedure)
• Absence of the left breast (Absence of Left Breast Value Set)	• Absence of the right breast (Absence of Right Breast Value Set)
• Left unilateral mastectomy (Unilateral Mastectomy Left Value Set)	• Right unilateral mastectomy (Unilateral Mastectomy Right Value Set)

Note

- *This measure assesses the use of imaging to detect early breast cancer in women. Because the measure denominator does not remove women at higher risk of breast cancer, all types and methods of mammograms (screening, diagnostic, film, digital or digital breast tomosynthesis) qualify for numerator compliance. Do not count MRIs, ultrasounds or biopsies towards the numerator: although these procedures may be indicated for evaluating women at higher risk for breast cancer or for diagnostic purposes, they are performed as an adjunct to mammography and do not alone count toward the numerator.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table BCS-1/2: Data Elements for Breast Cancer Screening

	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	✓
Number of optional exclusions	✓
Numerator events by administrative data	✓
Numerator events by supplemental data	✓
Reported rate	✓

Table BCS-3: Data Elements for Breast Cancer Screening

	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	*Each of the 6 stratifications and total*
Number of optional exclusions	*Each of the 6 stratifications and total*
Numerator events by administrative data	*Each of the 6 stratifications and total*
Numerator events by supplemental data	*Each of the 6 stratifications and total*
Reported rate	*Each of the 6 stratifications and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Breast Cancer Screening

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age as of June 30"). The denominator age range may be expanded to 40-74 years of age.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefit	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	NA	There is no event/diagnosis for this measure.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Value sets may not be changed.
Exclusions: I-SNP, LTI, Frailty or Advanced Illness	Yes	These exclusions are not required. Refer to *Exclusions* in the *Guidelines for the Rules for Allowable Adjustments*.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Mammogram	No	Value sets and logic may not be changed.

Urinary Tract Infection (Catheter-Associated Urinary Tract Infection [CAUTI] and Non-Catheter-Associated Urinary Tract Infection [UTI]) and Other Urinary System Infection [USI]) Events

Introduction: Urinary tract infections (UTIs) are the fourth most common type of healthcare-associated infection, with an estimated 93,300 UTIs in acute care hospitals in 2011. UTIs additionally account for more than 12% of infections reported by acute care hospitals[1]. Virtually all healthcare-associated UTIs are caused by instrumentation of the urinary tract.

Approximately 12%-16% of adult hospital inpatients will have an indwelling urinary catheter (IUC) at some time during their hospitalization, and each day the indwelling urinary catheter remains, a patient has a 3%-7% increased risk of acquiring a catheter-associated urinary tract infection (CAUTI).[2-3]

CAUTI can lead to such complications as prostatitis, epididymitis, and orchitis in males, and cystitis, pyelonephritis, gram-negative bacteremia, endocarditis, vertebral osteomyelitis, septic arthritis, endophthalmitis, and meningitis in patients. Complications associated with CAUTI cause discomfort to the patient, prolonged hospital stay, and increased cost and mortality[4]. It has been estimated that each year, more than 13,000 deaths are associated with UTIs.[5]

Prevention of CAUTI is discussed in the CDC/HICPAC document, *Guideline for Prevention of Catheter-associated Urinary Tract Infection*.[6]

Settings: Surveillance may occur in any inpatient location(s) where denominator data can be collected, such as critical intensive care units (ICU), specialty care areas (SCA), step- down units, wards, inpatient rehabilitation locations, and long term acute care locations. Neonatal ICUs may participate, but only off plan (not as a part of their monthly reporting plan). A complete listing of inpatient locations and instructions for mapping are located in the CDC Locations and Descriptions chapter.

Note: Surveillance for CAUTI after the patient is discharged from the facility is not required. However, if discovered, any CAUTI with a date of event (DOE) on the day of discharge or the next day is attributable to the discharging location and should be included in any CAUTIs reported to NHSN for that location (see Transfer Rule Chapter 2). No additional indwelling urinary catheter days are reported.

Refer to the NHSN Patient Safety Manual, Chapter 2 *Identifying Healthcare Associated Infections in NHSN* and Chapter 16 *NHSN Key Terms* for definitions of the following universal concepts for conducting HAI surveillance.

I. Date of event (DOE)
II. Healthcare associated infection (HAI)
III. Infection window period (IWP)
IV. Present on admission (POA)
V. Repeat infection timeframe (RIT)
VI. Secondary BSI attribution period (SBAP)
VII. Location of Attribution (LOA)
VIII. Transfer rule

Definitions:

Urinary tract infections (UTI) are defined using Symptomatic Urinary Tract Infection (SUTI) criteria, Asymptomatic Bacteremic UTI (ABUTI), and Urinary System Infection (USI) criteria. (See Table 1 and 2 and Figure 2).

Note: UTI is a primary site of infection and cannot be considered secondary to another site of infection.

Indwelling urinary catheter: A drainage tube that is inserted into the urinary bladder through the urethra, is left in place, and is connected to a drainage bag (including leg bags). These devices are also called Foley catheters. Condom or straight in-and-out catheters are not included nor are nephrostomy tubes, ileoconduits, or suprapubic catheters unless a Foley catheter is also present. Indwelling urethral catheters that are used for intermittent or continuous irrigation are included in CAUTI surveillance.

Catheter-associated UTI (CAUTI): A UTI where an indwelling urinary catheter was in place for >2 calendar days on the **date of event**, with day of device placement being Day 1*,
AND
an indwelling urinary catheter was in place on the date of event or the day before. If an indwelling urinary catheter was in place for more than 2 consecutive days in an inpatient location and then removed, the date of event for the UTI must be the day of device discontinuation or the next day for the UTI to be catheter-associated.

*If the IUC was in place prior to inpatient admission, the catheter day count that determines device –association begins with the admission date to the first inpatient location. This allows for consistency with device denominator count (see Table 3 Denominator Data Collection Methods)

Example of Associating Catheter Use to UTI:

A patient in an inpatient unit has an IUC inserted and the following day is the date of event for a UTI. Because the IUC has not been in place for more than 2 consecutive days in an inpatient location on the date of event, this is not a CAUTI. However, depending on the date of admission, this may be a healthcare-associated UTI and sets an RIT. Please refer to SUTI 1b: Non-CAUTI.

Notes:

- SUTI 1b and USI cannot be catheter-associated.
- SUTI 1b cannot be met in a patient > 65 years of age with fever >38^0 C as the only element within the Infection Window Period.

Indwelling urinary catheters that are removed and reinserted: If, after an IUC removal, the patient is without an IUC for at least 1 full calendar day (NOT to be read as 24 hours), then the IUC day count will start anew. If instead, a new IUC is inserted before a full calendar day has passed, the indwelling urinary catheter device day count, to determine eligibility for a CAUTI, will continue uninterrupted.

Figure 1: Associating Catheter Use to UTI

	March 31 (Hospital day 3)	April 1	April 2	April 3	April 4	April 5	April 6
Patient A	IUC **Day 3**	IUC **Day 4**	IUC removed **(Foley Day 5)**	IUC replaced **(Foley Day 6)**	IUC **Day 7**	IUC removed **Day 8**	No IUC
Patient B	IUC **Day 3**	IUC **Day 4**	IUC removed **(IUC Day 5)**	No IUC	IUC replaced **(IUC Day 1)**	IUC **Day 2**	IUC **Day 3**

Rationale: NHSN surveillance for infection is not aimed at a specific device. Instead surveillance is aimed at identifying risk to the patient that is the result of device use in general.

Notes:

- In the examples above, Patient A is eligible for a CAUTI beginning on March 31, through April 6th, since an IUC was in place for some portion of each calendar day until April 6th. A UTI with date of event on April 6th would be a CAUTI since the IUC had been in place greater than 2 days and was removed the day before the date of event.

- Patient B is eligible for a CAUTI on March 31 (IUC Day 3) through April 3. The IUC had been in place > 2 days and an HAI occurring on the day of device discontinuation or the following calendar day is considered a device-associated infection.
- If the patient did not have a CAUTI by April 3, the patient is not eligible for a CAUTI until April 6, when the second IUC had been in place for greater than 2 days.

Table 1. Urinary Tract Infection Criteria

Criterion	Urinary Tract Infection (UTI)
	Symptomatic UTI (SUTI) Must meet at least ***one*** of the following criteria:
SUTI 1a **Catheter-associated Urinary Tract Infection (CAUTI) in any age patient**	Patient must meet 1, 2, and 3 below: 1. Patient had an indwelling urinary catheter that had been in place for more than 2 consecutive days in an inpatient location on the date of event AND was either: • Present for any portion of the calendar day on the date of event†, **OR** • Removed the day before the date of event‡ 2. Patient has at least ***one*** of the following signs or symptoms: • fever (>38.0°C): Reminder: To use fever in a patient > 65 years of age, the IUC needs to be in place for more than 2 consecutive days in an inpatient location on date of event and is either still in place OR was removed the day before the DOE. • suprapubic tenderness* • costovertebral angle pain or tenderness* • urinary urgency ^ • urinary frequency ^ • dysuria ^ 3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml (See Comments). All elements of the SUTI criterion must occur during the IWP (See IWP Definition Chapter 2 Identifying HAIs in NHSN). † When entering event into NHSN choose "INPLACE" for Risk Factor for IUC ‡ When entering event into NHSN choose "REMOVE" for Risk Factor for IUC *With no other recognized cause (see Comments) ^ These symptoms cannot be used when catheter is in place. An IUC in place could cause patient complaints of "frequency" "urgency" or "dysuria". **Note:** • Fever is a non-specific symptom of infection and cannot be excluded from UTI determination because it is clinically deemed due to another recognized cause.

SUTI 1b **Non-Catheter-associated Urinary Tract Infection (Non-CAUTI) in any age patient**	Patient must meet 1, 2, and 3 below: 1. One of the following is true: • Patient has/had an indwelling urinary catheter but it has/had not been in place for more than 2 consecutive days in an inpatient location on the date of event† **OR** • Patient did not have an indwelling urinary catheter in place on the date of event nor the day before the date of event † 2. Patient has at least ***one*** of the following signs or symptoms: • fever (>38°C) in a patient that is ≤ 65 years of age • suprapubic tenderness***** • costovertebral angle pain or tenderness***** • urinary frequency ^ • urinary urgency ^ • dysuria ^ 3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of ≥10^5 CFU/ml. (See Comments) All elements of the SUTI criterion must occur during the IWP (See IWP Definition Chapter 2 Identifying HAIs in NHSN). † When entering event into NHSN choose "NEITHER" for Risk Factor for IUC *****With no other recognized cause (see Comments) ^These symptoms cannot be used when IUC is in place. An IUC in place could cause patient complaints of "frequency" "urgency" or "dysuria". **Note:** • Fever is a non-specific symptom of infection and cannot be excluded from UTI determination because it is clinically deemed due to another recognized cause.

SUTI 2 **CAUTI or Non-CAUTI in patients 1 year of age or less**	Patient must meet 1, 2, and 3 below: 1. Patient is ≤1 year of age (with‡ or without an indwelling urinary catheter) 2. Patient has at least ***one*** of the following signs or symptoms: • fever (>38.0°C) • hypothermia (<36.0°C) • apnea* • bradycardia* • lethargy* • vomiting* • suprapubic tenderness* 3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of ≥10^5 CFU/ml. (See Comments) All elements of the SUTI criterion must occur during the IWP (See IWP Definition Chapter 2 Identifying HAIs in NHSN). ‡ If patient had an IUC in place for more than 2 consecutive days in an inpatient location and the IUC was in place on the date of event or the previous day the CAUTI criterion is met. If no such IUC was in place, UTI (non-catheter associated) criterion is met. *With no other recognized cause (See Comments) **Note:** Fever and hypothermia are non-specific symptoms of infection and cannot be excluded from UTI determination because they are clinically deemed due to another recognized cause.

Comments	"Mixed flora" is not available in the pathogen list within NHSN. Therefore, it cannot be reported as a pathogen to meet the NHSN UTI criteria. Additionally, "mixed flora" represent at least two species of organisms. Therefore, an additional organism recovered from the same culture would represent >2 species of organisms. Such a specimen also cannot be used to meet the UTI criteria. The following excluded organisms cannot be used to meet the UTI definition: ➢ Any *Candida* species as well as a report of "yeast" that is not otherwise specified ➢ mold ➢ dimorphic fungi or ➢ parasites An acceptable urine specimen may include these organisms as long as one bacterium of greater than or equal to 100,000 CFU/ml is also present. Additionally, these non-bacterial organisms identified from blood cannot be deemed secondary to a UTI since they are excluded as organisms in the UTI definition. ➢ Suprapubic tenderness whether elicited by palpation (tenderness-sign) or provided as a subjective complaint of suprapubic pain (pain-symptom), documentation of either found in the medical record is acceptable as a part of SUTI criterion if documented in the medical record during the Infection Window Period. ➢ Lower abdominal pain or bladder or pelvic discomfort are examples of symptoms that can be used as suprapubic tenderness. Generalized "abdominal pain" in the medical record is not to be interpreted as suprapubic tenderness as there are many causes of abdominal pain and this symptom is too general. ➢ Left or right lower back or flank pain are examples of symptoms that can be used as costovertebral angle pain or tenderness. Generalized "low back pain" is not to be interpreted as costovertebral angle pain or tenderness.

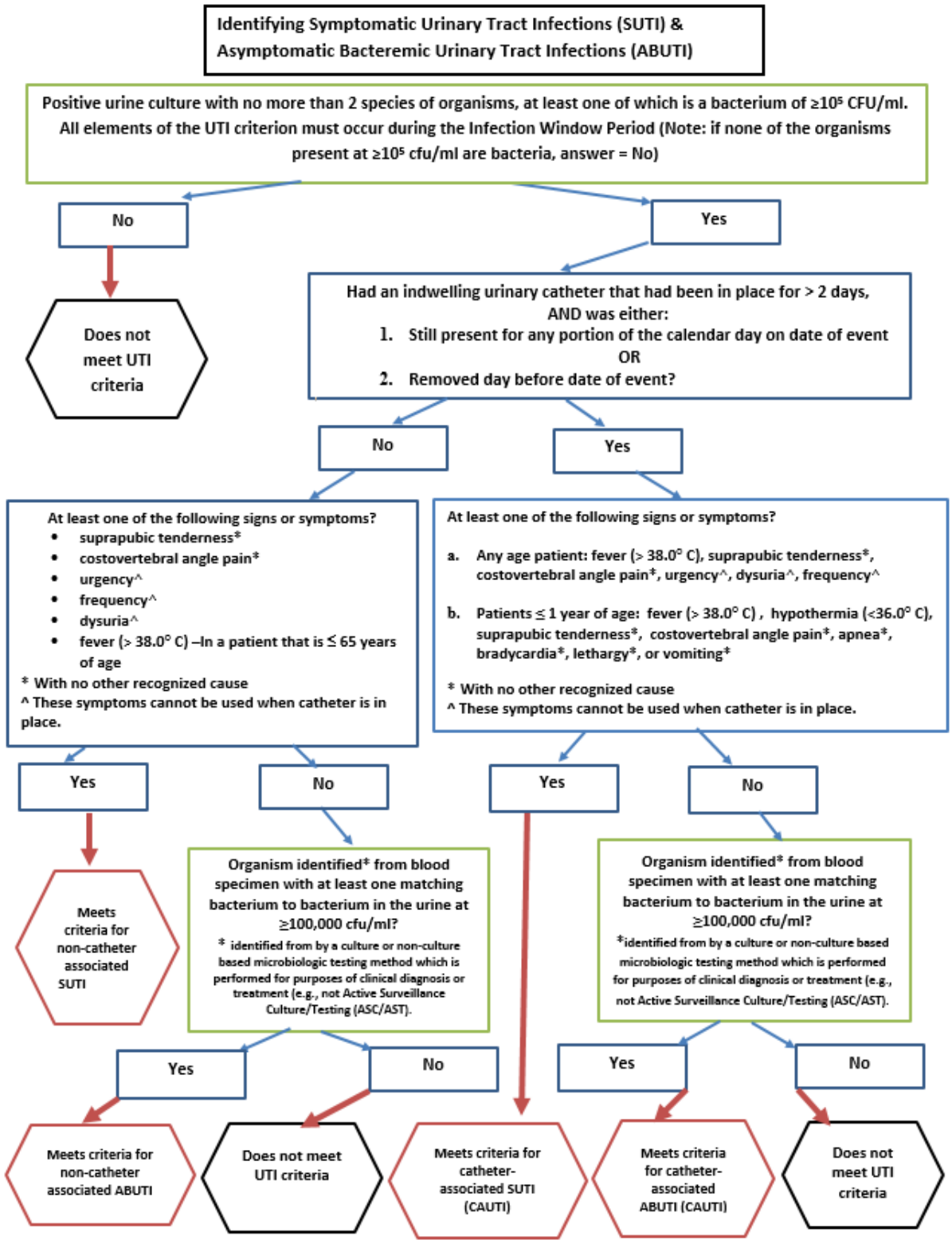
	Asymptomatic Bacteremic Urinary Tract Infection (ABUTI) (in any age patient)
	Patient must meet 1, 2, and 3 below: 1. Patient with* or without an indwelling urinary catheter has no signs or symptoms of SUTI 1 or 2 according to age (**Note**: Patients > 65 years of age with a non-catheter-associated ABUTI **may** have a fever and still meet the ABUTI criterion) 2. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a bacterium of $\geq 10^5$ CFU/ml (see Comment section below) 3. Patient has organism identified** from blood specimen with at least ***one*** matching bacterium to the bacterium identified in the urine specimen, or meets LCBI criterion 2 (without fever) and matching common commensal(s) in the urine. All elements of the ABUTI criterion must occur during the Infection Window Period (See Definition Chapter 2 Identifying HAIs in NHSN). *Patient had an IUC in place for more than 2 consecutive days in an inpatient location on the date of event, and IUC was in place on the date of event or the day before. *Catheter - associated ABUTI is reportable if CAUTI is in the facility's reporting plan for the location.* ** Organisms identified by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST).
Comments	A urine specimen with "Mixed flora" cannot be used to meet the urine criterion. Additionally, the following excluded organisms cannot be used to meet the UTI definition: • Any *Candida* species as well as a report of "yeast" that is not otherwise specified • mold • dimorphic fungi or • parasites An acceptable urine specimen may include these excluded organisms as long as one bacterium of greater than or equal to 100,000 CFU/ml is also present. Additionally, these non-bacterial organisms identified from blood cannot be deemed secondary to a UTI since they are excluded as organisms in the UTI definition.

Table 2. Urinary System Infection Criteria Criterion

Criterion	**Urinary System Infection (USI) (kidney, ureter, bladder, urethra, or perinephric space)** Other infections of the urinary system must meet at least ***one*** of the following criteria:
	1. Patient has organisms identified** from fluid (excluding urine) or tissue from affected site 2. Patient has an abscess or other evidence of infection on gross anatomical exam, during invasive procedure, or on histopathologic exam 3. Patient has at least ***one*** of the following signs or symptoms: • fever (>38.0°C) • localized pain or tenderness* **And at least *one* of the following:** a) purulent drainage from affected site b) organisms identified** from blood and imaging test evidence of infection (e.g., ultrasound, CT scan, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium]) which if equivocal is supported by clinical correlation (i.e., physician documentation of antimicrobial treatment for urinary system infection). 4. Patient ≤1 year of age has at least ***one*** of the following signs or symptoms: • fever (>38.0°C) • hypothermia (<36.0°C) • apnea* • bradycardia* • lethargy* • vomiting* **And at least *one* of the following:** a) purulent drainage from affected site b) organisms identified** from blood and imaging test evidence of infection, (for example , ultrasound, CT scans, magnetic resonance imaging [MRI], or radiolabel scan [gallium, technetium])

	* With no other recognized cause ** Organisms identified by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST). **Notes:** • Fever and hypothermia are non-specific symptoms of infection and cannot be excluded from USI determination because they are clinically deemed due to another recognized cause. • All elements of the USI criterion must occur during the IWP (See IWP Definition Chapter 2 Identifying HAIs in NHSN).
Reporting Instructions	• Report infections following circumcision in newborns as SST-CIRC. • If patient meets USI criteria and they also meet UTI criteria, report UTI only, unless the USI is a surgical site organ/space infection, in which case, only USI should be reported. • For NHSN reporting purposes, Urinary System Infection (USI) cannot be catheter associated, therefore, USI will only present as specific event type if urinary catheter status is marked "Neither".

Figure 2: Identifying SUTI and ABUTI Flowchart



Monthly Summary Data

Numerator Data: The *Urinary Tract Infection (UTI)* form (CDC 57.114) is used to collect and report each CAUTI that is identified during the month selected for surveillance. The Instructions for Completion of Urinary Tract Infection form include brief instructions for collection and entry of each data element on the form. USIs are never included in CAUTI data and are reported separately on the HAI Custom Event Form. The UTI form includes patient demographic information and information on whether or not an indwelling urinary catheter was present. Additional data include the specific criteria met for identifying the UTI, whether the patient developed a secondary bloodstream infection, whether the patient died, and the organisms isolated from cultures and their antimicrobial susceptibilities.

Reporting Instructions:
If no CAUTIs are identified during the month of surveillance, the " Report No Events" box must be checked on the appropriate denominator summary screen, (for example , *Denominators for Intensive Care Unit (ICU)/Other Locations (Not NICU or SCA/ONC)*.

Denominator Data: Device days and patient days are used for denominators (See Key Terms chapter).The method of collecting device-day denominator data may differ depending on the location of patients being monitored. The following methods may be used:

Table 3: Denominator Data Collection Methods

Denominator Data Collection Method	**Details**
Manual, Daily (specifically, collected at the same time **every day** of the month)	Denominator data (patient days and device days) should be collected at the same time, every day, for each location performing surveillance to ensure that differing collection methods don't inadvertently result in device days being > patient days. The Instructions for Completion of Denominators for Intensive Care Unit (ICU)/Other Locations (Not NICU and SCA/ONC) and Instructions for Completion of Denominators for Specialty Care Areas (SCA)/Oncology (ONC) contain brief instructions for collection and entry of each data element on the form. Indwelling urinary catheter days, which are the number of patients with an indwelling urinary catheter device, are collected daily, at the same time each day, according to the chosen location using the appropriate form (CDC 57.117 and 57.118). These daily counts are summed and only the total for the month is entered into NHSN. Indwelling urinary catheter days and patient days are collected separately for each of the locations monitored.

Denominator Data Collection Method	Details
Manual, sampled once/week (collected at the same time on the same designated day, **once per week**)	To reduce staff time spent collecting surveillance data, once weekly sampling of denominator data to generate estimated urinary catheter days may be used as an alternative to daily collection in non-oncology ICUs and wards (see Notes below). Sampling may not be used in SCA/ONC locations or NICUs. During the month, the number of patients in the location (patient-days) and the number of patients with an indwelling urinary catheter (urinary catheter-days) is collected on a designated day each week (for example, every Tuesday), at the same time during the month. Evaluations of this method have repeatedly shown that use of Saturday or Sunday generate the least accurate estimates of denominator data, and, therefore, these days should not be selected as the designated day.[7-9] If the day designated for the collection of sampled data is missed, collect the data on the next available day instead. The following must be collected and entered into NHSN: 1. The monthly total for patient-days, based on collection daily 2. The sampled total for patient-days 3. The sampled total urinary catheter-days When these data are entered, the NHSN application will calculate an estimate of urinary catheter-days. **Notes:** • To ensure the accuracy of estimated denominator data obtained by sampling, only ICU and ward location types with an average of 75 or more urinary catheter-days per month are eligible to use this method. A review of each location's urinary catheter denominator data for the past 12 months in NHSN will help determine which locations are eligible. • The accuracy of estimated denominator data generated by sampling can be heavily influenced by incorrect or missing data. Careful implementation of data collection following the guidance in this protocol is essential to avoid erroneous fluctuations in rates or Standardized Infection Ratios (SIRs).

Denominator Data Collection Method	Details
Electronic	For ***any*** location, denominator data from electronic sources (for example, urinary catheter days from electronic charting), may be used after validation of a minimum three consecutive months proves the data to be within 5% (+/-) of the manually-collected, once a day counts. Perform the validation of electronic counts separately for each location conducting CAUTI surveillance.

Data Analyses: The Standardized Infection Ratio (SIR) is calculated by dividing the number of observed infections by the number of predicted infections. The number of predicted infections is calculated using probabilities from negative binomial regression models constructed from 2015 NHSN data, which represents a standard population. More information regarding the CAUTI SIR model and the parameter estimates can be found in the SIR Guide.

Notes:
The SIR will be calculated only if the number of predicted CAUTIs (numPred) is ≥1 to help enforce a minimum precision criterion.

While the CAUTI SIR can be calculated for single locations, the measure also allows you to summarize your data by multiple locations, adjusting for differences in the incidence of infection among the location types. For example, you will be able to obtain one CAUTI SIR adjusting for all locations reported. Similarly, you can obtain one CAUTI SIR for all ICUs in your facility.

The SUR, or Standardized Utilization Ratio, is a risk-adjusted summary measure for device use. Similar to the SIR, the SUR can be calculated for single locations as well as be summarized across multiple locations. More information regarding the CAUTI SUR model and the parameter estimates can be found in the SUR Guide.

The CAUTI rate per 1000 urinary catheter days is calculated by dividing the number of CAUTIs by the number of catheter days and multiplying the result by 1000. The Urinary Catheter Utilization Ratio is calculated by dividing the number of urinary catheter days by the number of patient days. These calculations will be performed separately for the different types of ICUs, specialty care areas, and other locations in the institution, except for neonatal locations.

Descriptive analysis output options of numerator and denominator data, such as line listings, frequency tables, and bar and pie charts are available in the NHSN application. SIRs, SURs

and CAUTI rates and run charts are also available. Guides on using NHSN analysis features are available at: www.cdc.gov/nhsn/PS-Analysis-resources/reference-guides.html. A troubleshooting guide for the CAUTI SIR is available at: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sur-guide-508.pdf

Table 3. CAUTI Measures Available in NHSN

Measure	**Calculation**	**Application**
CAUTI SIR	The number of Observed CAUTIs The number of Predicted CAUTIs	Both location specific and summarized measure
CAUTI Rates	The number of CAUTIs for a location x 1000 The number of Urinary Catheter Days for a location	Location specific measure only
Urinary Catheter SUR	The number of Observed Urinary Catheter Days The number of Predicted Urinary Catheter Days	Both location specific and summarized measure
DUR	The Urinary Catheter Days for a location The Patient Days for that location	Location specific measure only

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Bloodstream Infection Event (Central Line-Associated Bloodstream Infection and Non-central Line Associated Bloodstream Infection)

Table of Contents

Table of Contents

Introduction: Although a 46% decrease in CLABSIs has occurred in hospitals across the U.S. from 2008-2013, an estimated 30,100 central line-associated bloodstream infections (CLABSI) still occur in intensive care units and wards of U.S. acute care facilities each year.[1] CLABSIs are serious infections typically causing a prolongation of hospital stay and increased cost and risk of mortality.

CLABSI can be prevented through proper insertion techniques and management of the central line. These techniques are addressed in the CDC's Healthcare Infection Control Practices Advisory Committee (CDC/HICPAC) *Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2011*.[2]

Settings: Surveillance may occur in any inpatient location where denominator data can be collected, which can include critical/intensive care units (ICU), specialty care areas (SCA), neonatal units including neonatal intensive care units (NICUs), step down units, wards, and long term care units. A complete listing of inpatient locations and instructions for mapping can be found in the CDC Locations and Descriptions chapter.

> **Note:** CLABSI surveillance after patient discharge from a facility is not required. However, if discovered, any CLABSI with a date of event (DOE) on the day of or the day after discharge is attributed to the discharging location and should be communicated to that facility to encourage appropriate NHSN reporting of CLABSIs. (See Transfer Rule, Chapter 2). Do not collect or report additional central line days after discharge.

Key Terms and Abbreviations

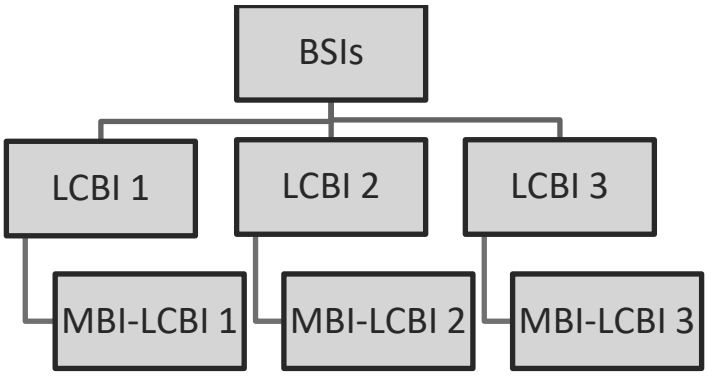
Refer to the NHSN Patient Safety Manual, Chapter *2 Identifying Healthcare Associated Infections in NHSN* and Chapter 16 *NHSN Key Terms* for definitions of the following universal concepts for conducting HAI surveillance.

I. Date of event (DOE)
II. Healthcare associated infection (HAI)
III. Infection window period (IWP)
IV. Present on admission (POA)
V. Repeat infection timeframe (RIT)
VI. Secondary BSI attribution period (SBAP)
VII. Location of Attribution (LOA)
VIII. Transfer rule

Definitions Specific to BSI / CLABSI Surveillance:

Primary bloodstream infection (BSI): A Laboratory Confirmed Bloodstream Infection (LCBI) that is not secondary to an infection at another body site (see Appendix B. Secondary BSI Guide and CDC/NHSN Surveillance Definitions for Specific Types of Infection [Ch-17], UTI [Ch-7], Pneumonia (Ch-6), and SSI (Ch-9).

LCBI Hierarchy; Types of LCBIs (see Table 1 and Table 2):



Secondary BSI: A BSI that is thought to be seeded from a site-specific infection at another body site (see Appendix B. Secondary BSI Guide and CDC/NHSN Surveillance Definitions for Specific Types of Infection [Ch-17], UTI [Ch-7], Pneumonia (Ch-6), and SSI (Ch-9).

Secondary BSI Attribution Period (SBAP): the period in which a blood specimen must be collected for a secondary BSI to be attributed to a primary site of infection. This period includes the Infection Window Period (IWP) combined with the Repeat Infection Timeframe (RIT). It is 14-17 days in length depending upon the date of event (see Ch. 2 page 2-13).

Infusion: The administration of any solution through the lumen of a catheter into a blood vessel. Infusions include continuous infusion (for example, nutritional fluids or medications), intermittent infusion (for example, IV flush), IV antimicrobial administration, and blood transfusion or hemodialysis treatment.

Access: The performance of any of the following activities during the current inpatient admission:

- Line placement
- Use of (entering the line with a needle or needless device) any central line for:
  - Infusion
  - Withdrawal of blood
- Use for hemodynamic monitoring.

Notes:

1. If a patient is admitted to a *an inpatient* location with a central line (CL) already in place, and it is the patient's only CL, the day of ***first access*** in an inpatient location begins the central line day count (CL Day 1) for making central line-associated determinations. Note: simply "de-accessing" any type of central line (for example, removal of port needle but port remains in body) does not remove the patient from CLABSI surveillance nor from device day counts for reporting denominator summary data.

2. An inpatient location, for making determinations about central line access, includes but is not limited to, any department or unit within the facility that provides service to inpatients [for example, inpatient Dialysis, Operating Room (OR), Interventional Radiology, Gastroenterology Lab (GI), Cardiac Catheterization lab (CC), wards, ICUs, etc.].

3. Include any inpatient receiving dialysis in CLABSI surveillance conducted in the patient's assigned inpatient location, regardless of whether or not the patient only has one CL and dialysis staff are the only providers to access it during dialysis treatment.

   Examples: *CLABSIs in the following examples will be attributed to Unit A*
   - Patient on Unit A receives onsite dialysis by contracted dialysis staff
   - Dialysis staff travels to Unit A to provide dialysis to Unit A patient
   - Patient in Unit A for inpatient care is transported to dialysis unit within the facility for dialysis

   Because CLABSI events cannot be attributed to a non-bedded location, such events must be attributed to the inpatient location housing the patient.

Central line (CL): An intravascular catheter that terminates at or close to the heart, **OR** in one of the great vessels that is used for infusion, withdrawal of blood, or hemodynamic monitoring. Consider the following great vessels when making determinations about CLABSI events and counting CL device days:

- Aorta
- Pulmonary artery
- Superior vena cava
- Inferior vena cava
- Brachiocephalic veins
- Internal jugular veins
- Subclavian veins
- External iliac veins
- Common iliac veins
- Femoral veins
- In neonates, the umbilical artery/vein.

Notes:

1. Neither the type of device nor the insertion site are used to determine if a device is considered a central line for NHSN reporting purposes.
2. At times, a CL may migrate from its original central location after confirmation of proper placement. NHSN does not require ongoing verification of proper line placement. Therefore, once a line has been designated a CL **it continues to be a CL**, regardless of migration, until removed from the body or patient discharge, whichever comes first. CL days are included for any CLABSI surveillance conducted in that location.

3. An introducer is an intravascular catheter, and depending on the location of the tip and its use, may be considered a CL.
4. A non-lumened intravascular catheter that terminates at or close to the heart or in a great vessel that is not used for infusion, withdrawal of blood or hemodynamic monitoring is not considered a CL for NHSN reporting purposes (for example, non-lumened pacemaker wires. Please note: there are some pacemaker wires that do have lumens, which may be considered a central line).

Types of Central Lines for NHSN reporting purposes:

1. Permanent central line: Includes:
    a. Tunneled catheters, including tunneled dialysis catheters
    b. Implanted catheters (including ports)
2. Temporary central line: A non-tunneled, non-implanted catheter
3. Umbilical catheter**:** A vascular catheter inserted through the umbilical artery or vein in a neonate. All umbilical catheters are central lines.

Eligible Central Line: A CL that has been in place for **more than two consecutive calendar days** (on or after CL day 3), following the *first access* of the central line, in an inpatient location, during the current admission. Such lines are eligible for CLABSI events and remain eligible for CLABSI events until the day after removal from the body or patient discharge, whichever comes first. See Table 4 for examples

Central line-associated BSI (CLABSI): A laboratory confirmed bloodstream infection where an eligible BSI organism is identified and an **eligible central line** is present on the LCBI DOE or the day before.

Central line days: the number of days a central line has been accessed to determine if a LCBI is a CLABSI

Denominator device days: the count of central lines on an inpatient unit that is recorded in the monthly denominator summary data

Eligible BSI Organism: Any organism that is eligible for use to meet LCBI or MBI-LCBI criteria. In other words, an organism that is not an excluded pathogen for use in meeting LCBI or MBI-LCBI criteria. These organisms may or may not be included on the NHSN organism list. Please contact NHSN for guidance regarding organisms that are not included on the NHSN organism list

Devices Not Considered CLs for NHSN Reporting Purposes:

- Arterial catheters
- Arteriovenous fistula
- Arteriovenous graft

- Atrial catheters (also known as transthoracic intra-cardiac catheters, those catheters inserted directly into the right or left atrium via the heart wall)
- Extracorporeal membrane oxygenation (ECMO)
- Hemodialysis reliable outflow (HERO) dialysis catheter
- Intra-aortic balloon pump (IABP) devices
- Peripheral IV or Midlines
- Ventricular Assist Device (VAD)

Table 1: Laboratory-Confirmed Bloodstream Infection Criteria:
Must meet **one** of the following LCBI criteria:

Criterion	*Comments and reporting instructions that follow the site-specific criteria provide further explanation and are integral to the correct application of the criteria.* Once an LCBI determination is made, proceed to the MBI-LCBI definitions and determine if the corresponding MBI-LCBI criteria are also met (for example, after meeting LCBI 2, investigate for potential MBI-LCBI 2)
LCBI 1 If LCBI 1 criteria is met, consider MBI-LCBI 1	Patient of any age has a recognized bacterial or fungal pathogen not included on the NHSN common commensal list, identified from one or more blood specimens obtained by a culture or non-culture based microbiologic testing methods **AND** Organism(s) identified in blood is not related to an infection at another site (See Appendix B: Secondary BSI Guide). **Notes:** 1. If a patient meets both LCBI 1 and LCBI 2 criteria, report LCBI 1 with the recognized pathogen entered as pathogen #1 and the common commensal as pathogen #2. 2. No additional elements (in other words, no sign or symptom such as fever) are needed to meet LCBI 1 criteria; therefore, the LCBI 1 DOE will always be the collection date of the first positive blood specimen used to set the BSI IWP.

LCBI 2

If LCBI 2 criteria is met, consider MBI-LCBI 2

Patient of any age has at least ***one*** of the following signs or symptoms: fever (>38.0ºC), chills, or hypotension

AND

Organism(s) identified in blood is not related to an infection at another site (See Appendix B: Secondary BSI Guide).

AND

The same NHSN common commensal is identified by a culture or non-culture based microbiologic testing method, from two or more blood specimens collected on separate occasions (see Blood Specimen Collection).

Common Commensal organisms include, but not are not limited to, diphtheroids (*Corynebacterium* spp. not *C. diphtheria*), *Bacillus* spp. (not *B. anthracis)*, *Propionibacterium* spp., coagulase-negative staphylococci (including *S. epidermidis)*, viridans group streptococci, *Aerococcus* spp. *Micrococcus* spp. and *Rhodococcus* spp. For a full list of common commensals, see the Common Commensal tab of the NHSN Organisms List.

Notes:

1. Criterion elements must occur within the 7-day IWP (as defined in Chapter 2) which includes the collection date of the positive blood specimen, the 3 calendar days before and the 3 calendar days after.
2. The two matching common commensal specimens represent a single element for use in meeting LCBI 2 criteria and the collection date of the ***first*** specimen is used to determine the BSI IWP.
3. At least one element (specifically, a sign or symptom of fever, chills or hypotension) is required to meet LCBI 2 criteria; the LCBI 2 DOE will always be the date the ***first*** element occurs for the first time during the BSI IWP, whether that be a sign or symptom or the positive blood specimen.

	6/1	Fever > 38.0 °C	**LCBI 2 DOE = 6/1**
	6/2	No LCBI element	
	6/3	No LCBI element	
Single element	6/4	*S. epidermidis*(1 of 2)	**Date of 1st diagnostic test = 6/4**
	6/5	*S. epidermidis*(2 of 2)	
	6/6	No LCBI element	
	6/7	No LCBI element	

LCBI 3

If LCBI 3 criteria is met, consider MBI-LCBI 3

Patient ≤ 1 year of age has at least ***one*** of the following signs or symptoms: fever (>38.0ºC), hypothermia (<36.0ºC), apnea, or bradycardia

AND

Organism(s) identified in blood is not related to an infection at another site (See Appendix B: Secondary BSI Guide).

AND

The same NHSN common commensal is identified by a culture or non-culture based microbiologic testing method, from two or more blood specimens collected on separate occasions (see Blood Specimen Collection).

Common Commensal organisms include, but not are not limited to, diphtheroids (*Corynebacterium* spp. not *C. diphtheria*), *Bacillus* spp. (not *B. anthracis)*, *Propionibacterium* spp., coagulase-negative staphylococci (including *S. epidermidis)*, viridans group streptococci, *Aerococcus* spp. *Micrococcus* spp, and *Rhodococcus* spp. For a full list of common commensals, see the Common Commensal tab of the NHSN organisms list.

Notes:

1. Criterion elements must occur within the 7-day IWP (as defined in Chapter 2) which includes the collection date of the positive blood specimen, the 3 calendar days before and the 3 calendar days after.
2. The two matching common commensal specimens represent a single element for use in meeting LCBI 2 criteria and the date of the ***first*** is used to determine the BSI IWP.
3. At least one element (specifically, a sign or symptom of fever, hypothermia, apnea or bradycardia) is required to meet LCBI 3 criteria; the LCBI 3 DOE will always be the date the ***first*** element occurs for the first time during the BSI IWP whether that be a sign or symptom or the positive blood specimen.

	6/1	No LCBI element	
	6/2	No LCBI element	
Single element	6/3	*S. epidermidis* (1 of 2)	**Date of 1st diagnostic test = 6/3 LCBI DOE = 6/3**
	6/4	*S. epidermidis* (1 of 2)	
	6/5	Apnea documented	
	6/6	No LCBI element	
	6/7	No LCBI element	

Table 2: Mucosal Barrier Injury Laboratory-Confirmed Bloodstream Infection (MBI-LCBI)
Must meet **one** of the following MBI-LCBI criteria

An MBI-LCBI is a subset of the LCBI criteria; therefore, a BSI event must fully meet an LCBI criterion before evaluating for the corresponding MBI-LCBI criteria.

The MBI-LCBI DOE will always be the date the prerequisite LCBI criteria was met. Abnormal ANC and WBC values reflect risk factors for acquiring an MBI-LCBI, not symptoms of infection and therefore are not used in DOE determinations.

MBI-LCBI 1	MBI-LCBI 2	MBI-LCBI 3
Patient of **any age** fully meets LCBI 1 criteria	Patient of **any age** fully meets LCBI 2 criteria	Patient **≤1 year of age** fully meets LCBI 3 criteria
with at least **one** blood specimen	with at least **two** blood specimens	
identified by culture or non-culture based microbiologic testing method		
with **ONLY intestinal organisms** from the NHSN MBI organism list*	with **ONLY Viridans Group *Streptococcus*** or ***Rothia spp.*** but no other organisms	

AND

Patient meets at least *one* of the following:

1. Is an allogeneic hematopoietic stem cell transplant recipient within the past year with one of the following documented during same hospitalization as positive blood specimen:
   a. Grade III or IV gastrointestinal graft versus host disease [GI GVHD]
   b. ≥1-liter diarrhea in a 24-hour period (or ≥20 mL/kg in a 24-hour period for patients <18 years of age) with onset on or within the 7 calendar days before the date the positive blood specimen was collected.
2. Is neutropenic, defined as at least two separate days with ANC† and/or WBC values <500 cells/mm^3 collected within a 7-day time period which includes the collection date of the positive blood specimen, the 3 calendar days before and the 3 calendar days after (See Table 6).

Note:

1. If a patient meets both MBI-LCBI 1 and MBI-LCBI 2 criteria (specifically has Viridans Group *Streptococcus* or *Rothia* spp. plus only other MBI organisms in the blood specimen), report organisms as MBI-LCBI 1 with the recognized pathogen as pathogen #1 and the common commensal as pathogen #2.
2. Any combination of ANC and/or WBC values can be used to meet neutropenic criteria provided they are collected on separate days within the 7-day period that includes the date of the positive blood specimen, the 3 calendar days before and the 3 calendar days after.

3. When a blood specimen positive for an organism not included on the NHSN MBI organism list is collected during the BSI RIT of an MBI-LCBI, the initial MBI-LCBI event is edited to an LCBI and the identified non-MBI organism is added.

*A partial list of MBI-LCBI organisms is provided in Appendix A.
See MBI organism tab on the NHSN organism list for the full list of MBI organisms.

† **Formula for calculating ANC if not provided by your laboratory:**

- The ANC is not always reported directly in the chart
- The WBC in the chart is usually reported in terms of thousand cell/mm^3

ANC = Absolute Segs + Absolute Bands

OR

ANC = WBC x %Segs + %Bands / 100

Example:
WBC: 2 k/mm^3 Segs: 20% Bands: 20% ANC = 2000 x (20+20)/100 = 800 cells/mm^3

Reporting Instructions:

Central Line data field should be marked "Yes" if Extracorporeal life support, (ECMO) and ventricular assist device (VAD) are present:

A BSI meeting LCBI criteria with an eligible central line where extracorporeal life support, (ECMO) and ventricular assist device (VAD) are present for more than 2 days on the BSI DOE, and is still in place on the DOE or the day before, will be considered an LCBI but not a CLABSI for NHSN reporting purposes. Starting in 2019, report such events, marking the "Central Line" risk factor field "Yes" as well as the ECMO or VAD field **(See Table 3).**

Central Line data field should be marked "No" regardless the presence of a CL:

See Table 3 for a Summary of CLABSI Exclusion and Reporting Requirements for 2019.

a. Patient Injection: A BSI meeting LCBI criteria that is accompanied by documentation of observed or suspected patient injection into the vascular access line, within the BSI IWP, will be considered an LCBI but not a CLABSI for NHSN reporting purposes. This exclusion is very specific to "INJECTION". Manipulating or tampering with the line (such as biting, picking at, sucking on, etc.) DOES NOT meet the intent of this exclusion. The documentation must state specifically that the patient was "observed injecting…" or "suspected of injecting…" the device. Insinuations or descriptive events that suggest such behavior DO NOT meet the intent of this exclusion. If entering into NHSN, answer "No" to the risk factor

field "Central line" Device days should be included in summary denominator counts. A subsequent positive blood specimen collected after the BSI RIT must be investigated and meet the exclusion criteria again in a new BSI IWP in order to determine it is not central line associated.

b. Also added to the protocol are reporting instructions for marking the "central line" data field "No" if during the current admission, there is either a diagnosis of Epidermolysis bullosa (EB) or documentation of known or suspected Munchausen Syndrome by Proxy (MSBP), also known as factitious disorder imposed on another. If a CL has been in place for more than 2 days on a BSI DOE, these events are considered LCBIs but are NOT considered central line associated. Optional fields for EB and MSBP are added to the BSI event form for use in 2019 and also will become required fields in 2020.

c. Occasionally, a patient with both a central line and another vascular access device will have pus at the other access site. If there is pus at the site of one of the following vascular access devices and a specimen collected from that site has at least one matching organism to an organism identified in blood enter "No" in the risk factor field for central line on the NHSN BSI event form if reporting. Device days however, should be included in the summary denominator count. Vascular access devices included in this exception are limited to:
- Arterial catheters
- Arteriovenous fistulae
- Arteriovenous grafts
- Atrial catheters (also known as transthoracic intra-cardiac catheters, those catheters inserted directly into the right or left atrium via the heart wall)
- Hemodialysis reliable outflow (HERO) dialysis catheters
- Intra-aortic balloon pump (IABP) devices
- Non-accessed CL (those neither inserted nor used during current admission)
- Peripheral IV or Midlines

d. Group B *Streptococcus* identified from blood, with a date of event during the first 6 days of life, will not be reported as a CLABSI. A BSI RIT will be set but no central line association is made. If reported to NHSN, the data field "Central Line" should be marked "No".

Note: Meeting LCBI criteria in all of the situations noted above result in setting a BSI RIT and any associated device days should be included in counts for denominator summary data.

Table 3: CLABSI Exclusions and Reporting of these events in 2019 :

CLABSI Exclusions	Exclusion Field Marked Yes or No	Central Line Field Marked Yes or No	Exclusion Reporting Requirement in 2019
Extracorporeal membrane oxygenation (ECMO)	-	-	-
• ECMO present >2 days on BSI DOE and in place on the DOE or the day before	**Y**	**Y**	**Required**
• NOT present > 2 days on BSI DOE, or NOT present on DOE or day before	**N**	**Y**	**Required**
Ventricular assist device (VAD)	-	-	-
• VAD present >2 days on BSI DOE and in place on the DOE or the day before	**Y**	**Y**	**Required**
• NOT present > 2 days on BSI DOE, or NOT present on DOE or day before	**N**	**Y**	**Required**
Epidermolysis Bullosa (EB)	**Y**	**N**	**Optional**
Munchausen's syndrome by proxy (MSBP)	**Y**	**N**	**Optional**
Patient self-injection	**Y**	**N**	**Optional**
Pus at vascular site	**Y**	**N**	**Optional**
Group B Streptococcus BSI- 1st 6 days of life	**Y**	**N**	**Optional**

A CLABSI determination includes a LCBI with an eligible organism and an eligible CL present on the DOE or day before. Therefore, Table 3 implies there is an ***eligible CL*** in place in all of the following scenarios.

Reporting Instructions:

1. The "Any hemodialysis question" grouped with the others for consistency, is not new. Continued useto identify trends related to dialysis is optional but does not affect central line association.

2. Do not report a BSI that has a DOE that occurs within a BSI RIT. However, add additional organisms identified that are eligible for BSI events to the initial BSI event. See RIT guidance in Chapter 2, Identifying Healthcare associated Infections or Chapter 16, Key Terms.

3. Only primary BSIs create a 14-day BSI RIT:
   Primary BSI example: Patient has a positive blood specimen identifying *S. aureus* on hospital day 6, which is not secondary to another site-specific source of infection. A subsequent positive blood specimen is collected on hospital day 12 that identifies *Pseudomonas aeruginosa*. Because this occurs in the BSI RIT, no new BSI event is identified or reported and *Pseudomonas* is added to the initial BSI event.

4. Secondary BSIs do not create a 14-day BSI RIT:

   Secondary BSI example: A SUTI with *Enterococcus faecalis* is identified and *E. faecalis* is also collected from a blood specimen on hospital day 11 within the SUTI secondary BSI attribution period. This BSI is secondary to the SUTI. Only a SUTI RIT is set, not a BSI RIT. On hospital day 15 (also within the SUTI RIT and secondary BSI attribution period), a blood culture which grows *Staphylococcus aureus* is collected. Because the blood growing *S. aureus* does not have at least one pathogen that matches the urine culture used to meet the SUTI criterion the BSI cannot be attributed as secondary to the SUTI. There is no BSI RIT in effect, therefore the BSI will need to be investigated as a new BSI event and either assigned as a secondary BSI to another primary site of infection or determined to be a primary BSI.

   Note: The secondary BSI attribution period of a primary source of infection is not a "catch all" for subsequent BSIs.

5. There is no expectation that positive blood specimens collected during the present on admission (POA) timeframe be investigated. If identified, they are not reported to NHSN. However, if a subsequent positive blood specimen is collected within 14 days of a positive blood specimen collected during the POA timeframe, it is imperative that a determination be made for the original blood specimen in order to make the correct determination about the subsequent blood specimen.
   Example 1: A patient has a positive blood specimen with *E. coli* that is POA 6/1. On 6/10, a subsequent positive blood specimen with *K. pneumonia* is collected. The 6/1 blood specimen is investigated and if determined to be a primary BSI, it sets a 14-day BSI RIT (6/1-6/14). Therefore, the 6/10 specimen is not a new BSI event and *K. pneumonia* is added to the POA BSI event if reported.

Example 2: A patient has a positive blood specimen that identifies *S. aureus* present on admission 6/1. On 6/10, a subsequent positive blood specimen with *K. pneumonia* is collected. To make the correct determination about the second blood specimen, the initial POA BSI event must be investigated to determine if it is primary or secondary to another site. In reviewing the chart, a right elbow culture from 5/31, also positive for *S. aureus*, plus the symptoms needed to meet JNT criteria 3c were documented making the 6/1 BSI secondary to JNT. The POA primary JNT infection creates a 14-day JNT RIT (6/1-6/14), during which no new JNT infections are reported. Because the subsequent blood specimen does not contain at least one matching pathogen to the specimen used to meet the JNT criteria, the positive blood with *K. pneumonia* cannot be attributed to the original JNT event and must be investigated as a primary or secondary BSI.

Purulent phlebitis confirmed with a positive semi quantitative culture of a catheter tip, but with either a negative or no blood culture is considered a CVS-VASC, not an LCBI, SST-SKIN, or an SST-ST infection.

Blood Specimen Collection

1. In LCBI criteria 2 and 3, the phrase "two or more blood specimens drawn on separate occasions" means:
   a. blood from at least two separate blood draws was collected on the same or consecutive calendar days, and
   b. two separate site preparations (decontamination steps) were performed during specimen collection.

   This will reduce misidentification of contaminated blood specimens as LCBIs. For example, aseptic technique indicates that separate site decontaminations would be performed for blood specimens drawn from different sites (in other words; different venipunctures, a combination of venipuncture and lumen withdrawal, or different lumens of the same central line), or at different times. Specimens collected in this manner would therefore be considered "separate occasions".
2. Specimen Collection Considerations: Blood specimens drawn through central lines can have a higher rate of contamination than blood specimens collected through peripheral venipuncture. [3, 4] However, all positive blood specimens, regardless of the site from which they are drawn or the purpose for which they are collected, must be included when conducting in-plan CLABSI surveillance (for example, weekly blood cultures performed in hematology and oncology locations).
3. Catheter tip cultures cannot be used in place of blood specimens for meeting LCBI criteria.
4. In MBI-LCBI 1, 2 and 3, "No other organisms" means there is no identification of a non-MBI-LCBI pathogen (such as *S. aureus*) or 2 matching common commensals (such as coagulase-negative *staphylococci*) collected from the blood on separate occasions that would otherwise meet LCBI criteria. If this occurs, the infection does not meet MBI-LCBI criteria.

5. When a blood specimen positive for an organism not included on the NHSN MBI organism list is collected during the BSI RIT of an MBI-LCBI, the initial MBI-LCBI event is edited to an LCBI and the identified non-MBI organism is added.

Table 4: Examples of Associating the Use of Central Lines to BSI Events (CLABSI): This table provides examples that illustrate:

- Device association as determined by the presence of an eligible CL on the BSI DOE or the day before.
- The goal of NHSN HAI surveillance is to identify risks to the patient that are the result of device use in general; therefore, NHSN will not require a BSI to be associated with a specific device when more than one line is present.

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient A: Port Status	Port in	Port in	Port in	Port in	Port in	Port in	Port in
Accessed	No	No	**Yes**	Yes	**Yes De-accessed***	No	No
Eligible for CLABSI event	No	No	No	No	**Yes-eligible CL**	Yes-eligible CL	Yes-eligible CL
			CL Day 1	CL Day 2	CL Day 3	CL Day 4	CL Day 5

Patient A becomes eligible for a CLABSI on 4/4 because an accessed port had been in place for some portion of > 2 consecutive calendar days making it an eligible CL on 4/4 (CL day 3). The port remains eligible for a CLABSI until it is removed or the patient is discharged, whichever comes first.

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient B: CL Status	CL in	CL in	CL in	CL in	**CL in / CL out**	No device	No device
Accessed	No	No	**Yes**	Yes	**Removed**	-	-
Eligible for CLABSI event	No	No	No	No	**Yes-eligible CL**	Yes-eligible CL	No
	-	-	**CL Day 1**	CL Day 2	CL Day 3	-	-

Patient B, eligible for a CLABSI on 4/4 (CL Day 3) through 4/5. An accessed CL had been in place > 2 consecutive calendar days making it an eligible CL on 4/4 (CL day 3). A BSI DOE on the day of or the day after device removal or patient discharge is considered device-associated (CLABSI).

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient C: CL Status	CL in	CL in	**CL in/ CL out**	CL in	CL in	**CL in/ CL out**	No device
Accessed	Yes	Yes	**Removed**	**Placed**	Yes	**Removed**	-
Eligible for CLABSI event	**Yes** **CL Day 3**	Yes CL Day 4	Yes CL Day 5	Yes CL Day 6	Yes CL Day 7	Yes CL Day 8	Yes -

Patient C, was admitted to an inpatient location on 3/29 with a central line in place. Patient C becomes eligible for a CLABSI on 3/31 (CL Day 3) through 4/6 because an accessed CL had been in place > 2 consecutive calendar days. A BSI DOE occurring on the day of or the day after device removal or patient discharge is considered a device-associated infection (CLABSI). The patient remains eligible for a CLABSI event through 4/6 because a full calendar day **did not pass** without a CL in place, therefore, device counts continue uninterrupted.

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient D: CL Status	**CL in**	CL in	**CL in/ CL out**	No device	**CL in**	CL in	**CL in**
Accessed	Yes	Yes	**Removed**	-	**Placed**	Yes	Yes
Eligible for CLABSI event	**Yes-eligible CL** **CL Day 3**	Yes-eligible CL CL Day 4	Yes-eligible CL CL Day 5	Yes-eligible CL	**No** **CL Day 1**	No CL Day 2	**Yes-eligible CL** CL Day 3

Patient D, was admitted to an inpatient location on 3/29 with a central line in place. Patient D becomes eligible for a CLABSI 3/31 (CL Day 3) through 4/3. An accessed CL had been in place > 2 consecutive calendar days, however, a full calendar day passed (4/3) with no CL in place, therefore, device day counts start over at CL day 1 when a new line is placed. After 4/3, the patient will not be eligible for a CLABSI event again until 4/6 when the new CL becomes an eligible CL (CL day 3).

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient E: CL Status	**No device**	**CL in**	CL in	CL in	CL in	CL in	CL in
Accessed	-	**Placed**	Yes	Yes	Yes	Yes	Yes
Eligible for CLABSI event	- -	No **CL Day 1**	No CL Day 2	**Yes-eligible CL** CL Day 3	Yes-eligible CL CL Day 4	Yes-eligible CL CL Day 5	Yes-eligible CL CL Day 6

Patient E, eligible for a CLABSI on 4/3 (CL Day 3) through 4/6 because line placement is considered first access which begins device day counts regardless of whether the line is being actively used or not and an accessed CL had been in place > 2 consecutive calendar days.

BOLD = change in status

- The procedure for de-accessing a port involves ensuring patency of the line prior to removal of the needle which involves blood withdrawal, an IV flush and injection of an anticoagulant.

Pathogen Exclusions and Reporting Considerations:

1. The term "recognized pathogen" in LCBI 1 criteria refers to any organism that is not included on the NHSN common commensal list (see NHSN Master Organism List for the complete list of common commensals used for NHSN reporting purposes). Exceptions:
   a. Organisms that are parasites and viruses are excluded as LCBI pathogens.
   b. Organisms belonging to the following genera are excluded as LCBI pathogens: *Campylobacter, Salmonella, Shigella, Listeria, Vibrio and Yersinia as well as C. difficile,* Enterohemorrhagic *E.coli, and* Enteropathogenic *E. coli*. These organisms are eligible for use in secondary BSI determinations but will not be reported as the sole pathogen in a primary BSI.
   c. Organisms belonging to the following genera cannot be used to meet any NHSN definition: *Blastomyces, Histoplasma, Coccidioides, Paracoccidioides, Cryptococcus, and Pneumocystis.* These organisms are excluded because they typically cause community-associated infections and are rarely known to cause healthcare-associated infections.

2. Business rules written into the pathogen fields of the NHSN application prevent entry of a common commensal as pathogen #1 when attempting to report both a recognized pathogen and commensal identified in an LCBI 1 or MBI-LCBI 1. In order to save the event successfully, enter the recognized pathogen first as pathogen # 1 and the common commensal as pathogen #2.
3. For LCBI criteria 2 and 3, if the common commensal is identified to the species level for one blood specimen, and a companion blood specimen is identified with only a descriptive name, which is complementary to the companion culture (in other words, to the genus level), then it is assumed the organisms are the same. An organism identified to the species level should be reported along with the antibiogram, if available (see Table 5). Colony morphology, biotype, and antibiogram comparisons should not be used to determine the 'sameness' of organisms because laboratory testing capabilities and protocols vary between facilities. To reduce reporting variabilities due to differences in laboratory practice only genus and species identification should be used and they should only be reported once. If antibiograms are available and the sensitivities differ for the same organisms in separate specimens, always report the more resistant panel (see Table 5).
4. A common commensal identified in a single blood specimen is considered a contaminant. It will not be used to meet LCBI 2 or 3 criteria nor will it prevent a case from meeting MBI-LCBI criteria when the organism requirements call for "only" a specific organism or type of organism (for example, "only intestinal organisms from the MBI list").

Table 5: Reporting Speciated and Unspeciated Organisms Identified from Blood Specimens

Culture Report	**Companion Culture Report**	**Report as…**
Coagulase-positive staphylococci	*S. aureus*	*S. aureus*
S. epidermidis	Coagulase-negative staphylococci	*S. epidermidis*
Enterococcus spp.	*E. faecium*	*E. faecium*
Bacillus spp. (not *anthracis*)	*B. cereus*	*B. cereus*
S. salivarius	Strep viridans	*S. salivarius*

Note: When identification to the species level is not provided, the genus of the organism will be reported to NHSN. When identification to the genus level is not provided, report the organism as available on the NHSN all organism list (for example, Gram-positive bacilli).

Table 6: Examples Illustrating the MBI-LCBI Criteria for Neutropenia

		Day -7	**Day -6**	**Day -5**	**Day -4**	**Day -3**	**Day -2**	**Day -1**	**Day 1***	**Day 2**	**Day 3**	**Day 4**
Pt. A	**WBC**	**100**	**800**	**400**	**300**	**ND**	**ND**	**320**	**400 + BC* x 1 *Candida* spp.**	**ND**	**550**	**600**
Pt. B	**ANC**	**ND**	**410**	**130**	**ND**	**ND**	**120**	**110**	**ND +BC* x 2 viridans strep plus fever >38°C**	**110**	**300**	**320**
Pt. C	**WBC**	**100**	**800**	**400**	**300**	**ND**	**ND**	**ND**	**600 + BC* x 1 *Candida* spp.**	**230**	**ND**	**400**

*ND = not done; *Collection date of positive blood specimen; Highlight = ANC/WBC < 500 cells/mm^3; red font = ANC/WBC value used to meet neutropenic criteria*

Rationale for Table 6:

Patient A meets MBI-LCBI 1 criteria with neutropenia: Positive blood specimen with intestinal organism (*Candida* spp.) and neutropenia*. In this case, the WBC values on Day 1 = 400, and Day -1 = 320 are used.

Patient B meets MBI-LCBI 2 criteria with neutropenia: At least two positive blood specimens with *viridans group streptococci,* fever >38°C and neutropenia*. In this case, the ANC values on day -1 = 110 and Day -2 = 120 are used.

Note: Any two of Days -2, -1, 2, 3, and 4 could be used to meet this requirement since WBC and/or ANC values of <500cells/mm^3 were present on those days.

Patient C meets MBI-LCBI 1 criteria with neutropenia: Positive blood specimen with intestinal organism (*Candida* spp.) and neutropenia*. In this case, WBC values on Day 2 = 230 and Day 4 = 400 are used.

*Neutropenia is defined as: 2 separate days of ANC or WBC <500 cells/mm^3 occurring on the collection date of the positive blood specimen (Day 1) or during the 3 days before or the 3 days after Day

Monthly Summary Data

Numerator Data: The *Primary Bloodstream Infection (BSI)* form (CDC 57.108) is used to collect and report each CLABSI that is identified during the month selected for surveillance. For CLABSI surveillance, all LCBI and MBI-LCBI that are identified as central-line associated must be included. The Instructions for Completion of Primary Bloodstream Infection (BSI) form contains brief instructions for collection and entry of each data element on the form. The *Primary BSI* form includes patient demographic information and whether a central line was present, and, if so, the type of central line the patient had if appropriate to the location; these data will be used to calculate line-specific infection rates. Additional data include the specific criteria met for identifying the primary BSI, whether the patient died, organisms identified from blood specimens, and the organisms' antimicrobial susceptibilities.

Reporting Instruction:
During the month of surveillance, if no CLABSI events are identified, the "Report No Events" box must be checked on the appropriate denominator summary screen, (for example, Denominators for Intensive Care Unit [ICU]/other locations [not NICU or SCA], etc.

Denominator Data: Device days and patient days are used for denominator reporting. Device-day denominator data that are collected differ according to the patient location. The following methods can be used for the collection of denominator data:

Table 7: Examples of Denominator Day counts for Device Days
This table provides examples that illustrate:

- Denominator device day counts for a central line present on an inpatient location at the time of the device day count.

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient A:	Inpatient Location ICU CL inserted	ICU CL in	ICU CL in	ICU CL in	ICU CL in	ICU CL in	ICU CL in
Denominator Day Counts for Device Days	Day 1*	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Patient A has a CL inserted in the ICU. Because the CL was inserted in an inpatient location, Day 1 will begin the denominator day count for device days. Patient A will have 7 denominator device days for 3/31-4/6.							

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient B:	ED CL in place at time of admission	Patient admitted to inpatient location ICU CL in	ICU CL in	ICU CL in	ICU CL in	Inpatient Location CL in	Inpatient Location CL in
Denominator Device Day Count	-	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6

Patient B, has a central at the time of admission. Because Patient B is admitted to the emergency department on 3/31, the denominator device day count will not begin until the patient is transferred to the inpatient location on 4/1. Patient B will have 6 denominator device days for 4/1-4/6.

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient C:	Inpatient Location ICU CL in place at time of admission	ICU CL in	ICU **CL in/ CL out**	ICU CL in	ICU CL in	**ICU CL in/ CL out**	ICU No device
Denominator Device Day Count	Day 1	Day 2	Day 3*	Day 4	Day 5	Day 6*	-

Patient C, has a central at the time of admission to ICU. Because Patient C is admitted to ICU on 3/31, the denominator device day count will begin on the day of admission (3/31). Because there is no device on 4/6, the denominator device day count will end on 4/5. Patient C will have 6 denominator device days for 3/31-4/5.

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient D:	Inpatient Location ICU **No device**	Inpatient Location ICU **CL inserted**	ICU CL in	ICU CL in	ICU CL in	ICU CL in	ICU CL in
Denominator Device Day Count	-	Day 1*	Day 2	Day 3	Day 4	Day 5	Day 6

Patient D, does not have a central line in place at the time of admission to ICU. Because there is no central line in place on admission, the denominator device day count will not begin until the central line is placed in the inpatient location on 4/1. Patient D will have 6 denominator device days for 4/1-4/6.

Date	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr
Patient E:	Inpatient Location ICU **Patient admitted with non-accessed port**	Inpatient Location ICU Port not accessed	ICU Port not accessed	ICU Port accessed	ICU Port accessed	ICU Port accessed	ICU Port accessed
Denominator Device Day Count	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7

Patient E, has a non-accessed port at the time of admission to ICU. The denominator device day count will begin on the date the patient is admitted to ICU (3/31). Accessing the port on 4/3 does not change the denominator device day count. Patient E will have 7 denominator device days for 3/31-4/6.

***If the central line is in place at the time of the denominator device count, it is included in the daily denominator device day count.**

Table 8: Denominator Data Collection Methods

Data Collection Method	Details
Manual, Daily	Denominator data (patient days and device days) should be collected at the same time, every day, for each location performing surveillance to ensure that differing collection methods don't inadvertently result in device days being > patient days. • For locations other than specialty care areas/oncology (SCA/ONC) and NICUs, the **number of patients** with at least one central line, of any type, is collected daily, at the same time each day during the month and is recorded on the *Denominators for Intensive Care Unit (ICU)/Other Locations (Not NICU or SCA/ONC)* form (CDC 57.118). Only the totals for the month are entered into NHSN **Notes:** 1. Only one central line per patient is counted per calendar day regardless of the number of central lines present. 2. All central lines on inpatient units should be included in device day counts regardless of access. • For specialty care areas/oncology, the number of patients with at least one central line are separated into those with permanent central lines and those with temporary central lines. The **number of patients** with at least one central line, of either or both type(s), is collected daily, at the same time each day during the month and is recorded on the *Denominators for Specialty Care Area (SCA)/Oncology (ONC)* form (CDC 57.117). Only the totals for the month are entered into NHSN. Temporary and permanent lines are reported separately in this location because permanent lines are more commonly used in this patient population and may be associated with a lower BSI rate when compared to temporary central lines. **Notes:** 1. Only one central line per patient is counted per calendar day regardless of the number of central lines present. 2. All central lines on inpatient units should be included in device day counts regardless of access. 3. If a patient has both a temporary and a permanent central line, only report the temporary line because it is associated with a higher risk of bloodstream infection.

Data Collection Method	Details
	The Instructions for Completion of Denominators for Intensive Care Unit (ICU)/Other Locations (Not NICU and SCA/ONC) and Instructions for Completion of Denominators for Specialty Care Areas (SCA)/Oncology (ONC) contain brief instructions for collection and entry of each data element on the form. • In NICUs, the **number of patients** with at least one central line is stratified by birth weight in five categories because the risk of BSI varies by birth weight. These data are reported on the *Denominators for Neonatal Intensive Care Unit (NICU)* form (CDC 57.116). **Note:** 1. Report only birth weight when entering BSI denominator data. The infant's weight at the time of BSI identification is not used and should not be reported. For example, a neonate weighs 1006 grams at birth but remains in the NICU for two months and has a body weight of 1650 grams when a CLABSI develops; enter the birth weight of 1006 grams on the BSI form. 2. All central lines on inpatient units should be included in device day counts regardless of access. The Instructions for Completion of Denominators for Neonatal Intensive Care Unit (NICU) form contains brief instructions for collection and entry of each data element on the forms.
Manual, sampled once/week (collected at the same time on the same designated day, once per week)	• To reduce staff time spent collecting surveillance data, once weekly sampling of denominator data to generate estimated central line days, may be used as an alternative to daily collection in non-oncology ICUs and wards (see Notes below). Sampling may not be used in SCA/ONC locations or NICUs. During the month, the number of patients in the location (patient-days) and the **number of patients** with at least one central line of any type (central line days) is collected on a designated day each week (for example, every Tuesday), and at the same time each day. • Evaluations of this method have repeatedly shown that use of Saturday or Sunday generate the least accurate estimates of denominator data, therefore, weekend days should not be selected as the designated

Data Collection Method	Details
	denominator data collection day.[6-8] If the designated day is missed, collect the denominator data on the next available weekday. • The following must be collected and entered into NHSN: 1. The monthly total for patient-days, collected daily 2. The sampled total for patient-days 3. The sampled total central line-days When these data are entered, the NHSN application will calculate an estimate of central line-days. **Notes:** 1. To ensure the accuracy of estimated denominator data obtained by sampling, only ICU and ward location types with an average of 75 or more central line-days per month are eligible to use this method. A review of each location's central line denominator data for the past twelve months in NHSN will help determine which locations are eligible. 2. The accuracy of estimated denominator data generated by sampling can be heavily influenced by incorrect or missing data. Careful implementation of data collection following the guidance in this protocol is essential to avoid erroneous fluctuations in rates or SIRs.
Electronic	For <u>any</u> location, denominator data from electronic sources (in other words, central line days from electronic charting may be used only after a validation of a minimum 3 consecutive months proves the data to be within 5% (+/-) of the manually collected once-a-day counts. Perform the validation of electronic counts separately for each location conducting CLABSI surveillance.

Data Analyses: The standardized infection ratio (SIR) is calculated by dividing the number of observed events by the number of predicted events. The number of predicted events is calculated using probabilities estimated from negative binomial models constructed from 2015 NHSN data, which represents the baseline population. The CLABSI SIR reports exclude MBI-LCBI events and MBI-LCBI events have their own SIR reports. Beginning with 2019 data, CLABSI SIR reports exclude ECMO and VAD events. For more information on using the CLABSI SIR reports, please see the troubleshooting guide: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/clabsicauti_sirtroubleshooting.pdf.

Note: The SIR will be calculated only if the number of predicted events (numPred) is ≥1 to help enforce a minimum precision criterion.

While SIRs can be calculated for single locations, the measure also allows you to summarize your data across multiple locations, adjusting for differences in the incidence of infection among the location types. For example, you can obtain one CLABSI SIR adjusting for all locations reported. Similarly, you can obtain one CLABSI SIR for all ICUs in your facility.

The SUR, or Standardized Utilization Ratio, is a risk adjusted summarized measure for device use. Similar to the SIRs, the SUR can be calculated for single locations as well as be summarized across multiple locations.

The CLABSI rate per 1000 central line days is calculated by dividing the number of CLABSIs by the number of central line days and multiplying the result by 1000. The Central Line Utilization Ratio is calculated by dividing the number of central line days by the number of patient days. These calculations will be performed separately for different types of ICUs, specialty care areas, oncology units, and other locations in the institution. Separate rates and ratios will also be calculated for different types of central lines in specialty care areas/oncology locations and for birth weight categories in NICUs.

Descriptive analysis output options of numerator and denominator data, such as line listings, frequency tables, and bar and pie charts are available in the NHSN application. CLABSI SIRs, rates, and run charts are also available. Guides on using NHSN analysis features are available from: https://www.cdc.gov/nhsn/ps-analysis-resources/reference-guides.html.

Table 9:CLABSI Measures Available in NHSN

Measure	Calculation	Application
CLABSI SIR (Excluding MBI-LCBIs, ECMO, and VAD)	The number of Observed CLABSIs / The number of Predicted CLABSIs	Both location specific and summarized measure
MBI-LCBI SIR (ACH Only)	The number of Observed MBI-LCBIs / The number of Predicted MBI-LCBIs	Both location specific and summarized measure
CLABSI Rates	The number of CLABSIs for a location x 1000 / The number of Central Line Days for that location	Location specific measure only
MBI-LCBI Rates	The number MBI-LCBIs for a location x 1000 / The number of Central Line Days for that location	Location specific measure only
Central Line SUR	The number of Observed Central Line Days / The number of Predicted Central Line Days	Both location specific and summarized measure
DUR	The Central Line Days for a location / The Patient Days for that location	Location specific measure only

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[2] O'Grady, NP., Alexander, M., Burns, LA., Dellinger, EP., Garland, J., Heard, SO., Maki, DG., et al. "Guidelines for the Prevention of Intravascular Catheter-related Infections". Clinical Infectious Diseases 52 (a): (2011): 1087-99.

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[4]Baron, EJ., Weinstein, MP., Dunne, WM., Yagupsky, P., Welch, DF., Wilson, DM. Blood Cultures; Approved Guideline. Washington, DC: ASM Press; 2005.

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[6] Klevens, RM., et al. "Sampling for Collection of Central Line Day Denominators in Surveillance for Healthcare-associated Bloodstream Infections". *Infection Control Hospital Epidemiology*. 27: (2006):338-42.

[7] Thompson, ND., et al." Evaluating the Accuracy of Sampling to Estimate Central Line–Days: Simplification of NHSN Surveillance Methods". *Infection Control Hospital Epidemiology*. 34(3): (2013): 221-228.

[8] See, I., et al. ID Week 2012 (Abstract #1284): Evaluation of Sampling Denominator Data to Estimate Urinary Catheter- and Ventilator-Days for the NHSN. San Diego, California. October 19, 2012.

Appendix A: Partial List of MBI-LCBI Organisms

Abiotrophia	*Escherichia (E)*	*Pantoea (+E)*
Alistipes	*Eubacterium*	*Parabacteroides*
Alloscardovia	*Ewingella (E)*	*Peptostreptococcus*
Anaerobiospirillum	*Faecalibacterium*	*Pichia*
Anaerococcus	*Filifactor*	*Porphyromonas*
Anaerorhabdus	*Finegoldia*	*Prevotella*
Arcobacter	*Flavonifractor*	*Proteus (E)*
Atopobium	*Fusobacterium*	*Providencia (E)*
Averyella (+E)	*Gemella*	*Pseudoflavonifractor*
Bacteroides	*Geotrichum*	*Pseudoramibacter*
Bifidobacterium	*Granulicatella*	*Rahnella (E)*
Bilophila	*Hafnia (E)*	*Raoultella (+E)*
Blautia	*Helcococcus*	*Rothia*
Buttiauxella (E)	*Helicobacter*	*Ruminococcus*
Campylobacter	*Klebsiella (E)*	*Saccharomyces*
Candida	*Kluyvera (E)*	*Sarcina*
Capnocytophaga	*Kluyveromyces*	*Serratia (E)*
CDC Enteric Group 58 (+E)	*Lactobacillus*	*Shigella (E)*
Cedecea (E)	*Leclercia (E)*	*Slackia*
Citrobacter (E)	*Leminorella (E)*	*Streptococcus (VGS subset)*
Clostridium	*Leptotrichia*	*Tannerella*
Collinsella	*Leuconostoc*	*Tatumella (E)*
Cronobacter (+E)	*Megamonas*	*Tetragenococcus*
Dialister	*Megasphaera*	*Tissierella*
Dichelobacter	*Mitsuokella*	*Trabulsiella (E)*
Edwardsiella (E)	*Moellerella (E)*	*Veillonella*
Eggerthella	*Mogibacterium*	*Weissella*
Eggerthia	*Morganella (E)*	*Yersinia (E)*
Enterobacter (E)	*Obesumbacterium (+E)*	*Yokenella (E)*
Enterococcus	*Odoribacter*	

E = Family Enterobacteriaceae

Note: See complete list of MBI Pathogens including species by selecting the MBI Organisms tab at the bottom of the NHSN Organism List

Appendix B: Secondary BSI Guide (*not applicable to Ventilator-associated Events [VAE]*)

The purpose of using the CDC/NHSN infection criteria is to identify and consistently categorize infections that are healthcare-associated into major and site-specific infection types. LCBI criteria include the caveat that the organism(s) identified from the blood cannot be related to infection at another site (in other words, it must be a primary BSI). One must be sure that there is no other CDC/NHSN defined primary site-specific infection that may have seeded the bloodstream secondarily; otherwise the bloodstream infection may be misclassified as a primary BSI and erroneously associated with the use of a central line, specifically called a CLABSI. For locations performing in-plan VAE surveillance, refer to Figure B2 in this appendix, as well as the VAE chapter for specific guidance on assigning a secondary BSI to a VAE. When conducting BSI surveillance the PNEU definitions (as well as UTI, SSI and all definitions found in Chapter 17) are available for attributing a secondary BSI for any patient in any location. For example, a ventilated patient in an adult location where VAE surveillance is being conducted can have a secondary BSI assigned to VAE or PNEU. A ventilated patient in a neonatal location where in-plan PedVAP surveillance is not an option can have a secondary BSI assigned to PNEU.

Secondary BSI Scenarios: For purposes of NHSN reporting, in order for a bloodstream infection to be determined secondary to another site of infection the following requirements must be met:*

An NHSN site-specific definition must be met; either one of the CDC/NHSN Surveillance Definitions for Specific Types of Infections (defined in Chapter 17), or UTI, PNEU or SSI definitions.

AND

One of the following scenarios must be met:

Scenario 1: At least one organism from the blood specimen matches an organism identified from the site-specific specimen that is used as an element to meet the NHSN site-specific infection criterion AND the blood specimen is collected during the secondary BSI attribution period (infection window period + repeat infection timeframe)†.

OR

Scenario 2: An organism identified in the blood specimen is an element that is used to meet the NHSN site-specific infection criterion, and therefore is collected during the site-specific infection window period.

Exception Notes:

1. *The necrotizing enterocolitis (NEC) definition does not include criteria for a matching site-specific specimen nor an organism identified from a blood specimen that can be used as an element to meet the NEC criteria, however an * exception for assigning a BSI secondary to NEC is provided.
    2. A BSI is considered secondary to NEC if the patient meets one of the two NEC criteria AND an organism identified from a blood specimen, collected during the secondary BSI attribution period, is an LCBI pathogen, or the same common commensal identified from two or more blood specimens drawn on separate occasions that are on the same or consecutive days.

2. † **The ENDO criteria have different rules** for infection window period, RIT, pathogen assignment and secondary BSI attribution period. (See ENDO criteria in Ch. 17).

- Below are examples with guidance on how to distinguish between the primary or secondary nature of a BSI. The definition of "matching organisms", important notes and reporting instructions are also provided. See Figure B1: Secondary BSI Guide for algorithmic display of the following instructions.

  Scenario 1: An organism identified from the site-specific infection is used as an element to meet the site-specific infection criterion, AND the blood specimen contains at least one matching organism to that site-specific specimen. The positive blood specimen must be collected during the site-specific infection's secondary BSI attribution period. (For your convenience, a list of infection criteria that include a blood specimen with at least one matching pathogen to the site-specific specimen that was used as an element to meet the definition are included in Table B1).

  a. **Example:** Patient meets NHSN criteria for a symptomatic urinary tract infection (suprapubic tenderness and $>10^5$ CFU/ml of *E. coli*) and blood specimen collected during the SUTI secondary BSI attribution period is positive for *E. coli*. This is a SUTI with a secondary BSI and the reported organism is *E. coli*.

  b. **Example:** Patient meets NHSN criteria for a symptomatic urinary tract infection (suprapubic tenderness and $>10^5$ CFU/ml of *E. coli*) and blood specimen collected during the SUTI secondary BSI attribution period grows *E. coli* and *P. aeruginosa*. This is a SUTI with a secondary BSI and the reported organisms are *E. coli* and *P. aeruginosa*, since both site and blood specimens are positive for at least one matching pathogen.

  c. **Example:** Patient meets NHSN criteria for a symptomatic urinary tract infection (suprapubic tenderness and $>10^5$ CFU/ml of *E. coli*) and a single blood specimen collected during the SUTI secondary BSI attribution period *E. coli* and *S. epidermidis*. This is a SUTI with a secondary BSI and the reported organism is only *E. coli*, since the single common commensal *S. epidermidis* positive blood specimen by itself does not meet BSI criteria.

  Scenario 2: An organism identified from a blood specimen is an element used to meet the site-specific infection criterion, and is collected during the site-specific infection window period. (For your convenience, a list of infection criteria that include positive blood culture as an element are included in Table B1).

  a. **Example:** Patient becomes febrile and complains of nausea and abdominal pain. CT scan done that day shows fluid collection suggestive of infection. Blood specimen collected that day results in identification of *Bacteroides fragilis.* Because the patient meets IAB criterion 3b, using the identification of an organisms from the blood specimen as an element (fever, nausea or abdominal pain, positive blood specimen and CT scan showing infection in abdominal cavity), the BSI is considered secondary to IAB.

b. **Example:** Patient is febrile, has a new onset of cough and has positive chest imaging test indicating the presence of an infiltrate. Blood specimens collected identify *Pseudomonas aeruginosa.* Because the patient can meet PNU2 definition using the identification of organisms from a blood specimen as one of the elements of the infection criterion (specifically, infiltrate on chest imaging test, fever, new onset of cough and organism identified from blood specimen), the BSI is considered secondary to PNEU.

Note: In situations where an NHSN infection definition can be met using more than one criterion of the infection definition, it is possible that identification of an organism from the blood and site-specific specimens may not match and a BSI may still be considered a secondary BSI. Consider the following:

a. **Example:** During the SSI surveillance period, a postoperative patient becomes febrile and complains of nausea and abdominal pain. CT scan done that day shows fluid collection suggestive of infection. Culture results show *Escherichia coli* from the T-tube drainage specimen and the blood specimen grows *Bacteroides fragilis.* Although the organisms in the blood culture and site-specific culture do not match for at least one organism, the blood culture is considered secondary to IAB. This is because the patient meets organ/space SSI IAB criterion 3b, using the identification of organism in a blood specimen as an element (fever, nausea or abdominal pain, organism identified from a blood specimen and CT scan showing infection in abdominal cavity). This patient also meets IAB criterion 3a using the positive site culture plus fever, and nausea or abdominal pain even though the organism involved is different from that used for IAB criterion 3b. In this case, the BSI is considered secondary to the organ/space SSI IAB and both organisms would be listed as IAB infection pathogens.

b. **Example:** Patient is febrile, has a new onset of cough and has positive chest imaging test indicating the presence of an infiltrate. Blood and bronchoalveolar lavage (BAL) specimens are collected. Results identify *Klebsiella pneumoniae* > 10^4 CFU/ml from the BAL and *Pseudomonas aeruginosa* from the blood. Although the organisms in the blood specimen and site-specific specimen do not match for at least one organism, because the patient can meet PNU2 definition using either the identification of organism from blood specimen or BAL specimen as one of the elements of the infection criterion (i.e. infiltrate on chest imaging test, fever, new onset of cough and organism identified from blood specimen or identified from BAL specimen), the blood is considered a secondary BSI to PNEU and both organisms would be listed as PNEU pathogens.

Note: If no matching organism is identified from the blood and the site-specific specimen, which is used to meet the site-specific infection definition, and the organism identified from the blood specimen cannot be used to meet the site-specific infection criteria, secondary BSI attribution cannot be assigned. The BSI would be primary in nature.

a. **Example:** Patient has pustules on their abdomen with tenderness and swelling. Purulent material is obtained from the pustules and is positive for *Streptococccus* Group B. A blood specimen collected the same day identifies methicillin resistant *Staphylococcus aureus*. Because the organisms from the site and blood specimens do not match, and there is no site-specific criterion for SKIN that includes organisms identified from blood specimen, both a site-specific infection, SKIN (criteria 1 and 2a) and a primary BSI would be reported.

b. **Example:** A patient has an abscess in the soft tissue around a percutaneous endoscopic gastrostomy (PEG) tube, identified by CT scan, and there is also purulent drainage from that site. No site-specific specimen was collected, but a blood specimen is positive for *Staphylococcus aureus*. No other sites of infection are identified. Because no culture of the site was collected, and the patient therefore cannot meet ST criterion 1, and because there is no ST criterion which uses identification of organism from blood specimen as an element, this patient has a ST infection with unknown pathogen (criterion 2), and a primary BSI with the pathogen *Staphylococcus aureus* for NHSN reporting purposes.

Table B1: Secondary BSI Guide: List of all NHSN primary site-specific definitions available for making secondary BSI determinations using Scenario 1 or Scenario 2

<table>
<tr><th>Scenario 1</th><th>Scenario 2</th></tr>
<tr><td>A positive blood specimen must contain at least one eligible matching organism to the site-specific specimen</td><td>Positive blood specimen must be an element of the site-specific definition</td></tr>
<tr><td>And the blood specimen is collected in the site-specific secondary BSI attribution period</td><td>And blood specimen is collected in the site-specific infection window period</td></tr>
<tr><td>And an eligible organism <u>identified from the site-specific specimen</u> is used as an element to meet the site-specific definition</td><td>And an eligible <u>organism</u> <u>identified in a blood specimen</u> is used as an element to meet the site-specific definition</td></tr>
<tr><td>
<table>
<tr><th>Site</th><th>Criterion</th></tr>
<tr><td>ABUTI</td><td>ABUTI</td></tr>
<tr><td>BONE</td><td>1</td></tr>
<tr><td>BRST</td><td>1</td></tr>
<tr><td>CARD</td><td>1</td></tr>
<tr><td>CIRC</td><td>2 or 3</td></tr>
<tr><td>CONJ</td><td>1</td></tr>
<tr><td>DECU</td><td>1</td></tr>
<tr><td>DISC</td><td>1</td></tr>
<tr><td>EAR</td><td>1, 3, 5 or 7,</td></tr>
<tr><td>EMET</td><td>1</td></tr>
<tr><td>ENDO</td><td>1</td></tr>
<tr><td>EYE</td><td>1</td></tr>
<tr><td>GE</td><td>2a</td></tr>
<tr><td>GIT</td><td>2a, 2b (only yeast)</td></tr>
<tr><td>IAB</td><td>1 or 3a</td></tr>
<tr><td>IC</td><td>1</td></tr>
<tr><td>JNT</td><td>1</td></tr>
<tr><td>LUNG</td><td>1</td></tr>
<tr><td>MED</td><td>1</td></tr>
<tr><td>MEN</td><td>1</td></tr>
<tr><td>ORAL</td><td>1 or 3a</td></tr>
<tr><td>OREP</td><td>1</td></tr>
<tr><td>PJI</td><td>1</td></tr>
<tr><td>PNEU</td><td>2 or 3</td></tr>
<tr><td>SA</td><td>1</td></tr>
<tr><td>SINU</td><td>1</td></tr>
<tr><td>SSI</td><td>SI, DI or OS</td></tr>
<tr><td>SKIN</td><td>2a</td></tr>
<tr><td>ST</td><td>1</td></tr>
<tr><td>UMB</td><td>1a</td></tr>
<tr><td>UR</td><td>1a or 3a</td></tr>
<tr><td>USI</td><td>1</td></tr>
<tr><td>SUTI</td><td>1a, 1b or 2</td></tr>
<tr><td>VASC only as SSI</td><td>1</td></tr>
<tr><td>VCUF</td><td>3</td></tr>
</table>
</td><td>
<table>
<tr><th>Site</th><th>Criterion</th></tr>
<tr><td>BONE</td><td>3a</td></tr>
<tr><td>BURN</td><td>1</td></tr>
<tr><td>DISC</td><td>3a</td></tr>
<tr><td>ENDO</td><td>4a, 4b, 5a or 5b (specific organisms)
6e or 7e plus other criteria as listed</td></tr>
<tr><td>GIT</td><td>1b or 2c</td></tr>
<tr><td>IAB</td><td>2b or 3b</td></tr>
<tr><td>JNT</td><td>3c</td></tr>
<tr><td>MEN</td><td>2c or 3c</td></tr>
<tr><td>OREP</td><td>3a</td></tr>
<tr><td>PNEU</td><td>2 or 3</td></tr>
<tr><td>SA</td><td>3a</td></tr>
<tr><td>UMB</td><td>1b</td></tr>
<tr><td>USI</td><td>3b or 4b</td></tr>
</table>
</td></tr>
</table>

Secondary BSI Reporting Instructions:

- For reporting secondary BSI for possible VAP (PVAP), see Figure B2 and Chapter 10.
- Do not report secondary bloodstream infection for vascular (VASC) infections, Ventilator-Associated Conditions (VAC), or Infection-related Ventilator-Associated Complications (IVAC), pneumonia 1 (PNEU 1).
- When a BSI is suspected to be secondary to a lower, respiratory tract infection the BSI can be determined to be secondary to VAE or PNEU definitions. (See Figure B2).
- Site-specific organism exclusions apply to secondary BSI attribution as well.

A **matching organism** is defined as one of the following:

1. If genus and species are identified in both specimens, they must be the same.
    a. **Example:** An intraabdominal specimen is used as an element to meet IAB definition and is growing *Enterobacter cloacae.* A blood specimen with a collection date in the IAB secondary BSI attribution period is reported to be growing *Enterobacter cloacae.* These are considered matching organisms.
    b. **Example:** An intraabdominal specimen is used as an element to meet IAB definition and is growing *Enterobacter aerogenes.* A blood specimen with a collection date in the IAB secondary BSI attribution period is reported to be growing *Enterobacter cloacae.* These are NOT considered matching organisms as the species are different.

2. If one organism is less definitively identified than the other, the lesser identified organism must be identified at least to the genus level and at that level the organisms must be the same.
    a. **Example:** A surgical wound growing *Pseudomonas* species is used to meet deep incisional SSI criteria and a blood specimen growing *Pseudomonas aeruginosa* is collected in the SSI secondary BSI attribution period. The organisms are considered matching at the genus level and therefore the BSI is secondary to the SSI.
    b. **Example:** PCR identifying *Enterococcus faecalis* in CSF meets the MEN definition. A subsequent blood culture collected in the MEN secondary BSI attribution period is identified as *Enterococcus* species. The organisms are considered to be matching and therefore the BSI is secondary to MEN.

3. There are two exceptions to the definition:
    a. Infections meeting LCBI 2 criteria with *Staphylococcus or Streptococcus*

        Example (*Staphylococcus*): A patient has a fever and a previous chest tube site is reddened, swollen and a culture is collected from the soft tissue. A culture of the chest tube site is positive for *Staphylococcus* species. SST/ST definition is met. The next day, two blood culture sets are collected. Both are positive for coagulase negative *Staphylococcus*. The organisms are NOT considered matching, because Staphylococcus

species could represent a coagulase negative or a coagulase positive *Staphylococcus.* Therefore, the BSI would not be considered secondary to SST/ST.

Example (*Streptococcus*): A patient has a fever and a previous chest tube is red and swollen and a culture is collected from the soft tissue. The chest tube site culture is reported positive for *Streptococcus* species. SST/ST definition is met. The next day 2 blood culture sets are collected. The blood cultures are both positive for *Streptococcus*, viridans group. The organisms are NOT considered matching, because *Streptococcus* species could represent a *Streptococcus*, viridans group or non- *Streptococcus*, viridans group. Therefore, the BSI would not be considered secondary to SST/ST.

b. In cases where an organism is identified only as "yeast" or "yeast not otherwise specified", the organism can be considered a match to other yeasts, when collected during the required timeframe, whether more fully identified or not.

Example: A culture of tissue from the ulcer margin of a decubiti reported positive for yeast is used as an element to meet the DECU definition. A blood specimen collected in the secondary BSI attribution period of the DECU is reported as *Candida albicans*. In this example the two organisms are considered matching organisms as the organisms are complementary (i.e., *Candida* is a type of yeast) and because yeasts isolated from non-sterile sites are commonly not identified to the genus or genus and species level.

Note: This exception is limited to yeast. It does not apply to identification of organisms as Gram positive cocci, Gram negative rods, etc.

Example: A culture of tissue from ulcer margin of a decubiti reported positive for Gram negative rod is used as an element to meet DECU definition. A blood specimen collected in the secondary BSI attribution period of the DECU is reported as *E.coli*. In this example the two organisms are NOT considered matching organisms.

Notes:

1. Antibiograms of the blood and potential primary site isolates do not have to match.
2. If the blood specimen by itself does not meet BSI criteria (for example, only one blood specimen positive for a common commensal), that specimen may not be used to meet secondary BSI criteria (see Scenario 1c).

Pathogen Assignment

- Additional pathogens identified from secondary BSIs, should be added to the pathogens reported for the primary infection type. The Secondary BSI data collection field should be checked yes.
- A secondary BSI pathogen may be assigned to two different primary sites of infection (for example, UTI and an IAB infection). In example 1 below, two primary sites of infection have been identified and a blood culture is collected within both the SUTI and the IAB secondary BSI attribution period. The blood culture pathogen matches the pathogens for both primary sites of infection (SUTI and IAB). Therefore, the pathogen is reported for both primary sites of infection as a secondary bloodstream infection.
- If at least one BSI pathogen with a collection date in the secondary BSI attribution period matches an organism from a specimen that was used to meet a site-specific infection criterion (either a site-specific specimen or a blood specimen) the BSI is considered secondary to the event. However, if no matching pathogen is identified, the subsequent BSI pathogen must be evaluated and deemed primary or secondary to another site-specific infection**. For example: A patient with a primary UTI with *E. coli* and a secondary BSI with *E. coli*** has a subsequent positive blood specimen with *yeast. Yeast* is an excluded pathogen for meeting UTI criteria; therefore, the subsequent blood must be evaluated as primary or secondary to another site-specific infection.

Example 1: Pathogen Assignment

Hospital Day (HD)	UTI SBAP	UTI RIT	UTI Infection Window Period	IAB Infection Window Period	IAB RIT	IAB SBAP
1						
2						
3						
4		1	**Urine culture**: >100,000 cfu/ml *K. pneumoniae*			
5		2	Fever > 38.0 C			
6		3				
7		4				
8		5		Fever >38.0 C, Abdominal pain		
9		6		CT Scan : Abdominal abscess		
10		7	Blood culture: *K. pneumoniae*	Blood culture: *K. pneumoniae*		
11		8				
12		9				
13		10				
14		11				
15		12				
16		13				
17		14				
18						
19						
20						
21						
22						
23						
			SUTI & Secondary BSI DOE = HD 4 Pathogen: *K. pneumoniae*	**IAB & Secondary BSI DOE = HD 8 Pathogen: *K. pneumoniae***		

Infection Window Period
(First positive diagnostic test, 3 days before and 3 days after)

Repeat Infection Timeframe (RIT)
(DOE = day 1)

Secondary BSI Attribution Period (SBAP)
(Infection Window Period + RIT)

Date of Event (DOE)
Date the first element occurs for the first time within the infection window period

Pathogens excluded from specific infection definitions (for example, yeast in UTI, or Enterococcus spp. for PNEU) are also excluded as pathogens for BSIs secondary to that type of infection (they cannot be added on to one of these infections as a pathogen). In example 2 below, the excluded organism must be accounted for as either 1) a primary bloodstream infection (BSI/CLABSI) or, 2) a secondary bloodstream infection attributed to another primary infection (for example, IAB, SINU). A blood culture with yeast and *E. faecalis* is collected during the SUTI RIT. A BSI secondary to SUTI is identified. *E. faecalis* is already documented as a pathogen, but the yeast will not be reported as a secondary BSI pathogen, because yeasts are excluded as organisms in the UTI definition. Because no other primary source of infection for which the yeast BSI can be assigned as secondary is found, a primary BSI with yeast is identified.

Note: The *Enterococcus faecalis* is not reported as a pathogen for the primary BSI because if an excluded organism had not been identified, a primary BSI would not have been reported.

Example 2: Pathogen Assignment (continued)

Hospital Day (HD)	UTI SBAP	UTI RIT	UTI Infection Window Period	BSI Infection Window Period	BSI RIT
1					
2					
3		1	Dysuria		
4		2	**Urine culture**: > 100,000 cfu/ml *E. faecalis*		
5		3			
6		4			
7		5			
8		6			
9		7			
10		8			
11		9	Blood culture: *E.faecalis* / Yeast	**Blood culture:** *E. faecalis* / Yeast	1
12		10			2
13		11			3
14		12			4
15		13			5
16		14			6
17					7
18					8
19					9
20					10
21					11
22					12
23					13
24					14
25					
			UTI & Secondary BSI DOE = HD 3 Pathogen: *E. faecalis*	**Primary BSI DOE = HD 11 Pathogen: Yeast**	

Infection Window Period
(First positive diagnostic test, 3 days before and 3 days after)

Repeat Infection Timeframe (RIT)
(date of event = day 1)

Secondary BSI Attribution Period (SBAP)
(Infection Window Period + RIT)

Date of Event (DOE)
Date the first element occurs for the first time within the infection window period

Example 3: Pathogen Assignment (continued)

Hospital Day (HD)	IAB SBAP	IAB RIT	IAB Infection Window Period	IAB Infection Window Period
1	Admit		Abdominal pain & distention	
2	PICC placed			
3				
4			US guided drainage-5L purulent peritoneal fluid: *Klebsiella pneumoniae* and *E.coli*	
5				
6				
7				
8				
9				
10				Abdominal pain
11				CTS multiple liver abscesses **Blood culture:** *C. glabrata, L. casei*
12				
13				jaundice, fever
14				
15				
			IAB 1 DOE = HD 4 Pathogens: *K. pneumoniae, E. coli*	**IAB 3b & Secondary BSI DOE = HD 4 Pathogens: *C. glabrata, L casei***

Infection Window Period
(First positive diagnostic test, 3 days before and 3 days after)

Repeat Infection Timeframe (RIT)
(date of event = day 1)

Secondary BSI Attribution Period (SBAP)
(Infection Window Period + RIT)

Date of Event (DOE)
Date the first element occurs for the first time within the infection window period

Only one infection of a specific type (or major type for BSI, UTI and pneumonia) is reported during an RIT for that type of event. However, a new event of the same specific type (or major type for BSI, UTI and pneumonia) can be identified during an RIT if all required elements occur within a new IWP and the DOE is within the RIT of the initial event. In example 3, IAB criteria 1 is met on hospital day-4 using organisms identified from purulent fluid. During the IAB RIT (hospital day 4-hospital day 17), IAB criteria 3a is met (on hospital day 10) using two symptoms, positive imaging evidence of an abscess and a positive blood specimen. The positive blood specimen occurs within the IAB secondary BSI attribution period, therefore, it is considered secondary to IAB. The pathogens, in this case, do not have to match because another definition (IAB 3b) is fully met within a new IAB IWP (hospital day 8-hospital day 14). Because the DOE (hospital day 10) occurs within the RIT of the initial IAB 1, a new event is not reported. The DOE, RIT and device association are not changed but any additional organisms identified (*C. glabrata* and *L casei*) are added to the initial IAB event if reported.

Example 4: Pathogen Assignment (continued)

Hospital Day (HD)	GIT SBAP	GIT RIT	GIT Infection Window Period	GIT Infection Window Period
1	Admit		Fever & vomiting	
2	PICC placed			
3				
4			CT bowel abscess	
5				
6			**Blood culture: *Enterococcus faecalis* X2**	
7				
8				
9				
10				
11				**Blood culture:** *Candida glabrata*
12				
13				Abscess drainage: *Candida glabrata* Abdominal pain and nausea
14				
15				
			GIT-2c DOE & Secondary BSI DOE= HD 1 Pathogen: *E. faecalis*	**GIT-2a & Secondary BSI DOE = HD 1 Pathogen: *C. glabrata***

Infection Window Period
(First positive diagnostic test, 3 days before and 3 days after)

Repeat Infection Timeframe (RIT)
(date of event = day 1)

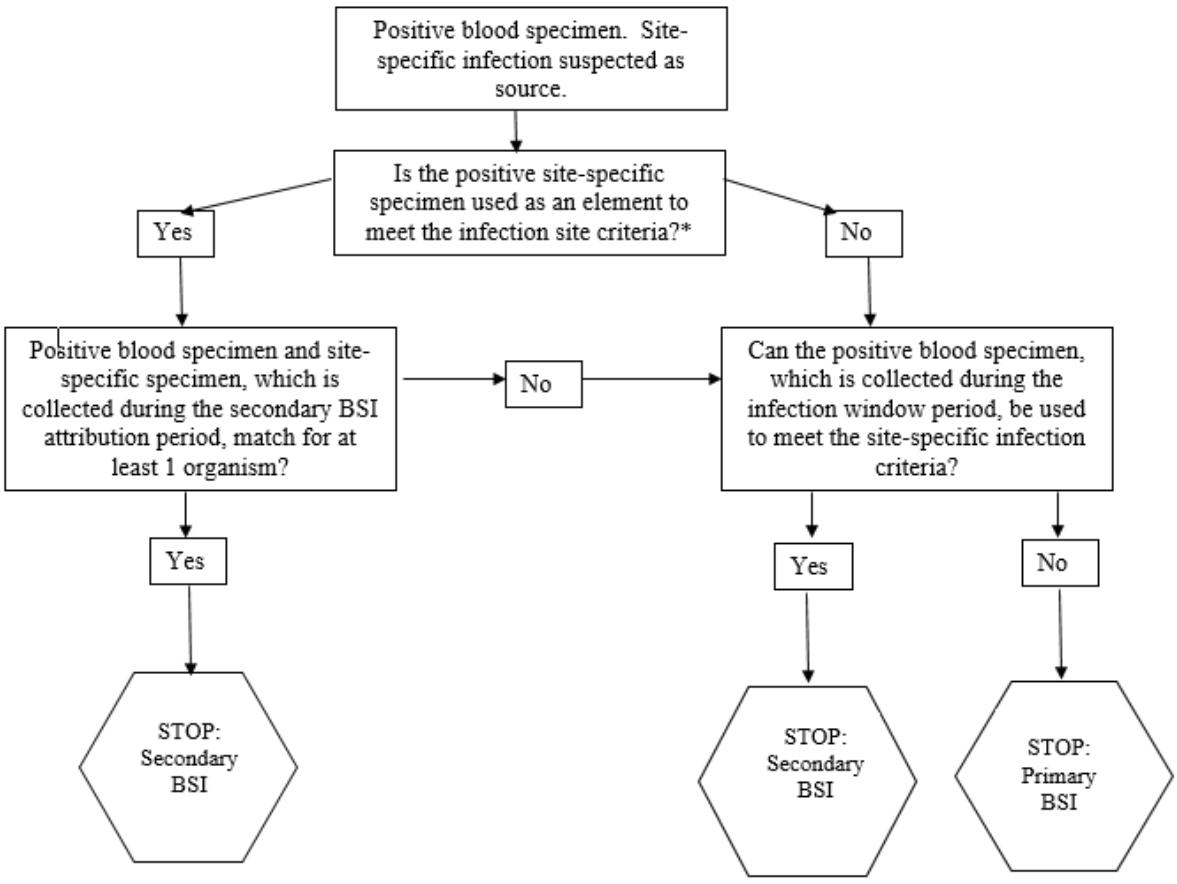
Secondary BSI Attribution Period (SBAP)
(Infection Window Period + RIT)

Date of Event (DOE)
Date the first element occurs for the first time within the infection window period

Only one infection of a specific type (or major type for BSI, UTI and pneumonia) is reported during an RIT for that type of event. However, a new event of the same specific type (or major type for BSI, UTI and pneumonia) can be identified during an RIT if all required elements occur within a new IWP and the DOE is within the RIT of the initial event. In example 4, GIT criterion 2c is met on hospital day-1 using two symptoms, positive imaging evidence of an abscess and a positive blood specimen. During the GIT RIT (hospital day 1-hospital day 14), GIT criteria 2a is met (on hospital day 11) using two symptoms and a positive abscess culture. The positive blood specimen occurs within the GIT secondary BSI attribution period and matches the organism identified from the abscess culture. Therefore, it is considered secondary to the GIT infection. In this case, the pathogens do not have to match because another definition (GIT 2a) is fully met within a new GIT IWP (hospital day 8-hospital day 14). Because the DOE (hospital day 11) occurs within the RIT of the initial GIT 2c, a new event is not reported. The DOE, RIT and device association are not changed but any additional organism identified (*C. glabrata*) is added to the initial GIT event if reported.

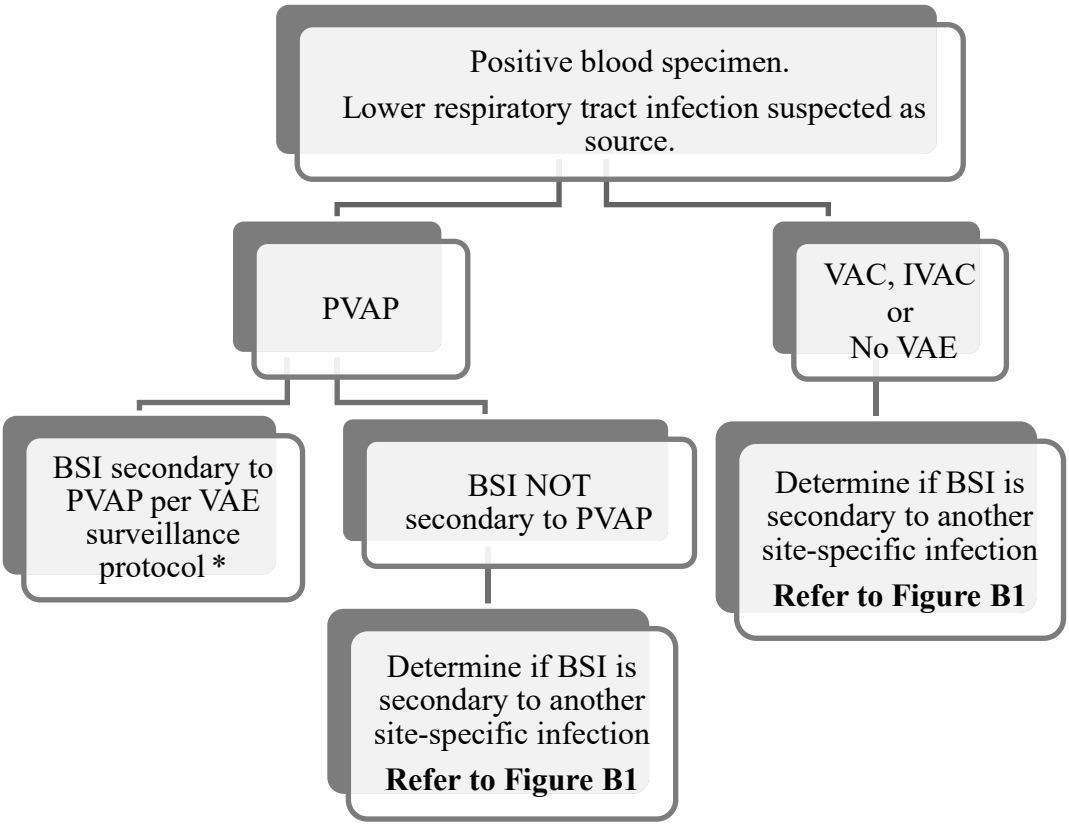
Note: This scenario is applicable to any site-specific infection definition from Chapter 17 or major infection type including BSI, UTI or pneumonia.

Figure B1: Secondary BSI Guide for eligible organisms*‡
(Not applicable to Ventilator-associated Events [VAE], See Figure B2)



*__Exception:__ The necrotizing enterocolitis (NEC) definition does not include criteria for a matching site-specific specimen nor an organism identified from a blood specimen, however an exception for assigning a BSI secondary to NEC is provided. A BSI is considered secondary to NEC if the patient meets one of the two NEC criteria **AND** an organism identified from a blood specimen, collected during the secondary BSI attribution period, is an LCBI pathogen or the same common commensal is identified from 2 or more blood specimens drawn on separate occasions but on the same or consecutive days.

Figure B2: VAE Guidance for Secondary BSI Determination



*Secondary BSIs may be reported for possible VAP (PVAP) events, provided that at least one organism identified from the blood specimen matches an organism identified from an appropriate respiratory tract specimen (including respiratory secretions, pleural fluid and lung tissue). The respiratory tract specimen must have been collected on or after the 3rd day of mechanical ventilation and within 2 calendar days before or after the day of onset of worsening oxygenation to be considered as a criterion for meeting the PVAP definitions. In addition, the blood specimen must have been collected during the 14-day event period, where day 1 is the day of onset of worsening oxygenation.

- In cases where PVAP is met with only the histopathology criterion and no culture or non-culture based test is performed on an eligible respiratory specimen, and there is also a positive blood specimen, a secondary BSI to VAE is not reported.
- In cases where a culture or non-culture based test of respiratory secretions, pleural fluid or lung tissue is performed and does not identify an organism that matches an organism identified from blood, a secondary BSI to VAE is not reported.

Note: Candida species or yeast not otherwise specified, *coagulase-negative Staphylococcus* species, and *Enterococcus* species identified from blood cannot be deemed secondary to a PVAP, unless the organism was also identified from pleural fluid or lung tissue.

Central Line Insertion Practices (CLIP) Adherence Monitoring

Introduction: Central line-associated bloodstream infections (CLABSIs) may be prevented through proper placement and management of the central line.[1-4] The CDC's Healthcare Infection Control Practices Advisory Committee (CDC/HICPAC) *Guidelines for the Prevention of Intravascular Catheter-Related Infections*, 2011[1] recommend evidence-based central line insertion practices known to reduce the risk of subsequent central line-associated bloodstream infection. These include hand hygiene by inserters, use of maximal sterile barriers during insertion, proper use of a skin antiseptic prior to insertion, and time to allow the skin antiseptic to dry before catheter insertion.

Several centers have found it useful to monitor adherence to evidence-based central line insertion practices as a method for identifying quality improvement opportunities and strategically targeting interventions. Feedback of adherence data has been a component of multifaceted interventions that have successfully reduced CLABSI rates.

Participation in NHSN CLIP surveillance enables participating facilities and CDC to:

- Monitor central line insertion practices in individual patient care units and facilities and provide aggregate adherence data for all participating facilities; facilities have the option of recording inserter-specific adherence data
- Facilitate quality improvement by identifying specific gaps in adherence to recommended prevention practices, thereby helping to target intervention strategies for reducing CLABSI rates

Participating facilities may perform surveillance for insertion practices during the following:

- a month when concurrent CLABSI surveillance is being conducted
- a month when no CLABSI surveillance is being conducted

If participating facilities wish to identify associations between insertion practices and outcomes (specifically, CLABSI), surveillance for insertion practices and CLABSI must be done concurrently.

Settings: Surveillance may occur in any type of patient care location where central lines are inserted.

Numerator and Denominator Data: The *Central Line Insertion Practices Adherence Monitoring Form* (CDC 57.125) is used to collect and report central line insertion practices for every central line insertion attempt occurring during the month in the unit(s) selected for surveillance. If an insertion attempt is unsuccessful, report a new CLIP event only if a new site preparation was performed. The *Table of Instructions for Completion of the Central Line Insertion Practices Adherence Monitoring Form* contains directions for collection and entry of each data element on the form. The form can be completed at or near the time of insertion, either by the inserter or an observer present at the insertion (for example, a nurse

Cervical Cancer Screening (CCS)

SUMMARY OF CHANGES TO HEDIS 2020

- Updated screening methods to include primary high-risk human papillomavirus testing.
- Modified value sets to make them compatible with digital measure formatting.
- Updated the Hybrid specification to indicate that sample size reduction is not allowed.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of women 21–64 years of age who were screened for cervical cancer using either of the following criteria:

- Women 21–64 years of age who had cervical cytology performed within the last 3 years.
- Women 30–64 years of age who had cervical high-risk human papillomavirus (hrHPV) testing performed within the last 5 years.
- Women 30–64 years of age who had cervical cytology/high-risk human papillomavirus (hrHPV) cotesting within the last 5 years.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicaid (report each product line separately).
Ages	Women 24–64 years as of December 31 of the measurement year.
Continuous enrollment	*Commercial:* The measurement year and the two years prior to the measurement year. *Medicaid:* The measurement year.
Allowable gap	No more than one gap in enrollment of up to 45 days during each year of continuous enrollment. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
Anchor date	December 31 of the measurement year.
Benefit	Medical.
Event/diagnosis	None.

Administrative Specification

Denominator The eligible population.

Numerator The number of women who were screened for cervical cancer. Either of the following meet criteria:

- Women 24–64 years of age as of December 31 of the measurement year who had cervical cytology (Cervical Cytology Lab Test Value Set; Cervical Cytology Result or Finding Value Set) during the measurement year or the two years prior to the measurement year.
- Women 30–64 years of age as of December 31 of the measurement year who had cervical high-risk human papillomavirus (hrHPV) testing (High Risk HPV Lab Test Value Set, High Risk HPV Test Result or Finding Value Set) during the measurement year or the four years prior to the measurement year ***and*** who were 30 years or older on the date of the test.

  Note: *Evidence of hrHPV testing within the last 5 years also captures patients who had cotesting; therefore additional methods to identify cotesting are not necessary.*

Exclusion *(optional)*

Hysterectomy with no residual cervix, cervical agenesis or acquired absence of cervix (Absence of Cervix Diagnosis Value Set; Hysterectomy With No Residual Cervix Value Set) any time during the member's history through December 31 of the measurement year.

Hybrid Specification

Denominator A systematic sample drawn from the eligible population. Because *Cervical Cancer Screening* has been significantly revised, sample size reduction is not allowed.

Numerator The number of women who were appropriately screened for cervical cancer as documented through either administrative data or medical record review.

Administrative Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record Appropriate screenings are defined by any of the following:

- Women 24–64 years of age as of December 31 of the measurement year who had cervical cytology during the measurement year or the two years prior to the measurement year.
  - Documentation in the medical record must include both of the following:
    - A note indicating the date when the cervical cytology was performed.
    - The result or finding.
  - Count any cervical cancer screening method that includes collection and microscopic analysis of cervical cells. Do not count lab results that explicitly state the sample was inadequate or that "no cervical cells were present"; this is not considered appropriate screening.

  - Do not count biopsies because they are diagnostic and therapeutic only and are not valid for primary cervical cancer screening.

  Note: *Lab results that indicate the sample contained "no endocervical cells" may be used if a valid result was reported for the test.*

- Women 30–64 years of age as of December 31 of the measurement year who had cervical high-risk human papillomavirus (hrHPV) testing during the measurement year or the four years prior to the measurement year ***and*** who were 30 years or older as of the date of testing.
  - Documentation in the medical record must include both of the following:
    - A note indicating the date when the hrHPV test was performed. Generic documentation of "HPV test" can be counted as evidence of hrHPV test.
    - The results or findings.
  - Do not count biopsies because they are diagnostic and therapeutic only and are not valid for primary cervical cancer screening.

  Note: *Evidence of hrHPV testing within the last 5 years also captures patients who had cotesting.*

Exclusion *(optional)*

Refer to *Administrative Specification* for exclusion criteria. Evidence of a hysterectomy with no residual cervix, cervical agenesis or acquired absence of cervix any time during the member's history through December 31 of the measurement year. Documentation of "complete," "total" or "radical" abdominal or vaginal hysterectomy meets the criteria for hysterectomy with no residual cervix. The following also meet criteria:

- Documentation of a "vaginal pap smear" in conjunction with documentation of "hysterectomy."
- Documentation of hysterectomy in combination with documentation that the patient no longer needs pap testing/cervical cancer screening.
  - Documentation of hysterectomy alone does not meet the criteria because it is not sufficient evidence that the cervix was removed.

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table CCS-1/2: Data Elements for Cervical Cancer Screening

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		✓
Current year's administrative rate (before exclusions)		✓
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		✓
Administrative rate on MRSS		✓
Number of medical records excluded because of valid data errors		✓
Number of administrative data records excluded		✓
Number of medical records excluded		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	✓	✓
Numerator events by medical records		✓
Numerator events by supplemental data	✓	✓
Reported rate	✓	✓

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Cervical Cancer Screening

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age as of June 30"). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefit	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	NA	There is no event/diagnosis for this measure.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Cervical cancer screening	No	Value sets and logic may not be changed.

Specifications Manual for Joint Commission National Quality Measures (v2019A)

Print this page

Release Notes:
Measure Information Form
Version 2019A

****NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE****

Measure Information Form

Measure Set: Perinatal Care (PC)

Set Measure ID: PC-02

Performance Measure Name: Cesarean Birth

Description: Nulliparous women with a term, singleton baby in a vertex position delivered by cesarean birth

Rationale: The removal of any pressure to not perform a cesarean birth has led to a skyrocketing of hospital, state and national cesarean birth (CB) rates. Some hospitals now have CB rates over 50%. Hospitals with CB rates at 15-20% have infant outcomes that are just as good and better maternal outcomes (Gould et al., 2004). There are no data that higher rates improve any outcomes, yet the CB rates continue to rise. This measure seeks to focus attention on the most variable portion of the CB epidemic, the term labor CB in nulliparous women. This population segment accounts for the large majority of the variable portion of the CB rate, and is the area most affected by subjectivity.

As compared to other CB measures, what is different about NTSV CB rate (Low-risk Primary CB in first births) is that there are clear cut quality improvement activities that can be done to address the differences. Main et al. (2006) found that over 60% of the variation among hospitals can be attributed to first birth labor induction rates and first birth early labor admission rates. The results showed if labor was forced when the cervix was not ready the outcomes were poorer. Alfirevic et al. (2004) also showed that labor and delivery guidelines can make a difference in labor outcomes. Many authors have shown that physician factors, rather than patient characteristics or obstetric diagnoses are the major driver for the difference in rates within a hospital (Berkowitz, et al., 1989; Goyert et al., 1989; Luthy et al., 2003). The dramatic variation in NTSV rates seen in all populations studied is striking according to Menacker (2006). Hospitals within a state (Coonrod et al., 2008; California Office of Statewide Hospital Planning and Development [OSHPD], 2007) and physicians within a hospital (Main, 1999) have rates with a 3-5 fold variation.

Type Of Measure: Outcome

Improvement Noted As: Decrease in the rate

Numerator Statement: Patients with cesarean births

Included Populations: *ICD-10-PCS Principal Procedure Code or ICD-10-PCS Other Procedure Codes* for cesarean birth as defined in Appendix A, Table 11.06

Excluded Populations: None

Data Elements:

- *ICD-10-PCS Other Procedure Codes*
- *ICD-10-PCS Principal Procedure Code*

Denominator Statement: Nulliparous patients delivered of a live term singleton newborn in vertex presentation

Included Populations:

- *ICD-10-PCS Principal Procedure Code or ICD-10-PCS Other Procedure Codes* for delivery as defined in Appendix A, Table 11.01.1
- Nulliparous patients with *ICD-10-CM Principal Diagnosis Code or ICD-10-CM Other Diagnosis Codes* for outcome of delivery as defined in Appendix A, Table 11.08 and with a delivery of a newborn with 37 weeks or more of gestation completed

Excluded Populations:

- *ICD-10-CM Principal Diagnosis Code or ICD-10-CM Other Diagnosis Codes* for multiple gestations and other presentations as defined in Appendix A, Table 11.09
- Less than 8 years of age
- Greater than or equal to 65 years of age
- Length of Stay >120 days
- *Gestational Age* < 37 weeks or UTD

Data Elements:

- *Admission Date*
- *Birthdate*
- *Discharge Date*
- *Gestational Age*
- *ICD-10-CM Other Diagnosis Codes*
- *ICD-10-CM Principal Diagnosis Code*
- *Previous Live Births*

Risk Adjustment: No.

Data Collection Approach: Retrospective data sources for required data elements include administrative data and medical records.

Data Accuracy: Variation may exist in the assignment of ICD-10 codes; therefore, coding practices may require evaluation to ensure consistency.

Measure Analysis Suggestions: In order to identify areas for improvement, hospitals may want to review results based on specific ICD-10 codes or patient populations. Data could then be analyzed further determine specific patterns or trends to help reduce cesarean births.

Sampling: Yes. For additional information see the Sampling Section.

Data Reported As: Aggregate rate generated from count data reported as a proportion.

Selected References:

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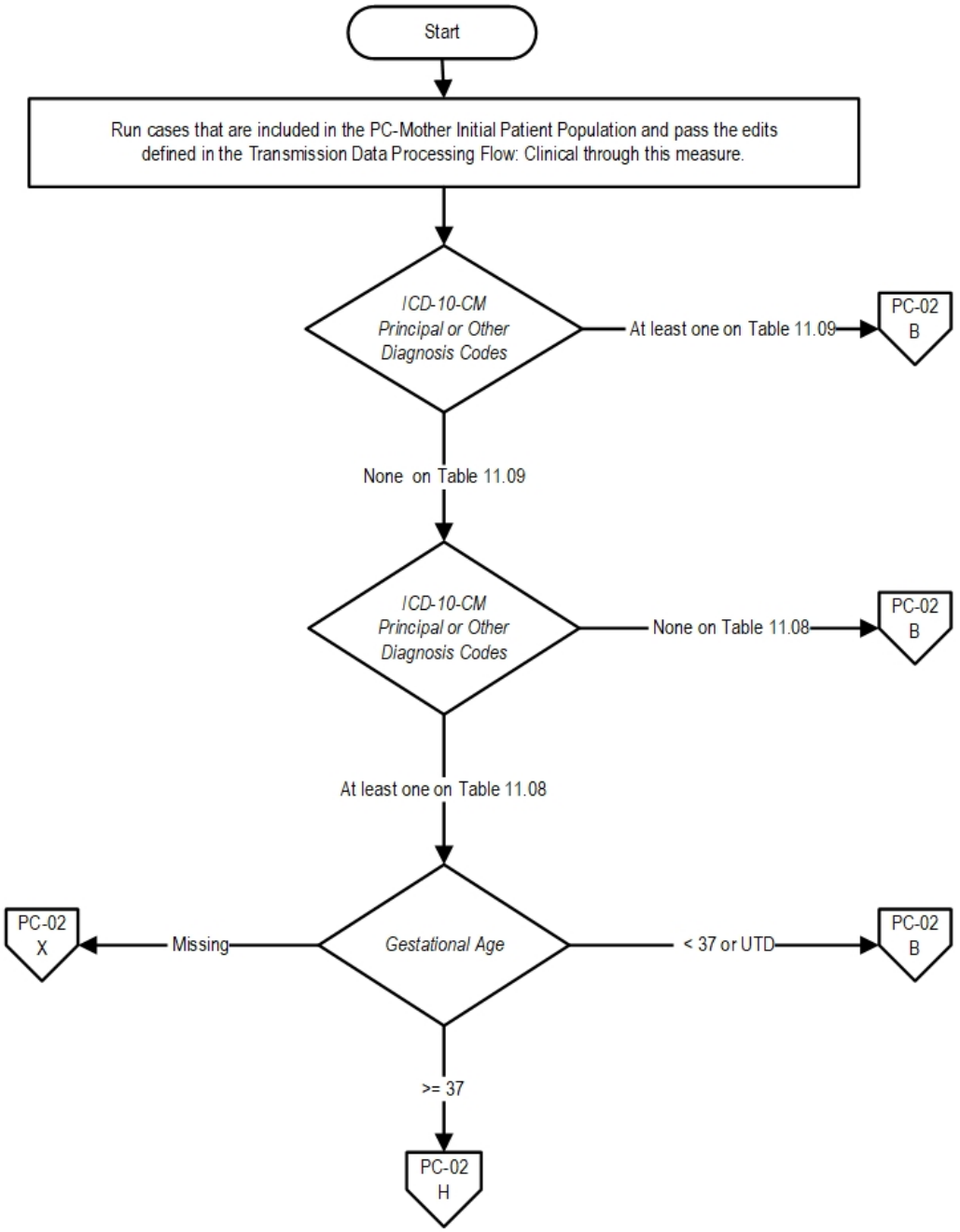
Original Performance Measure Source / Developer:
California Maternal Quality Care Collaborative

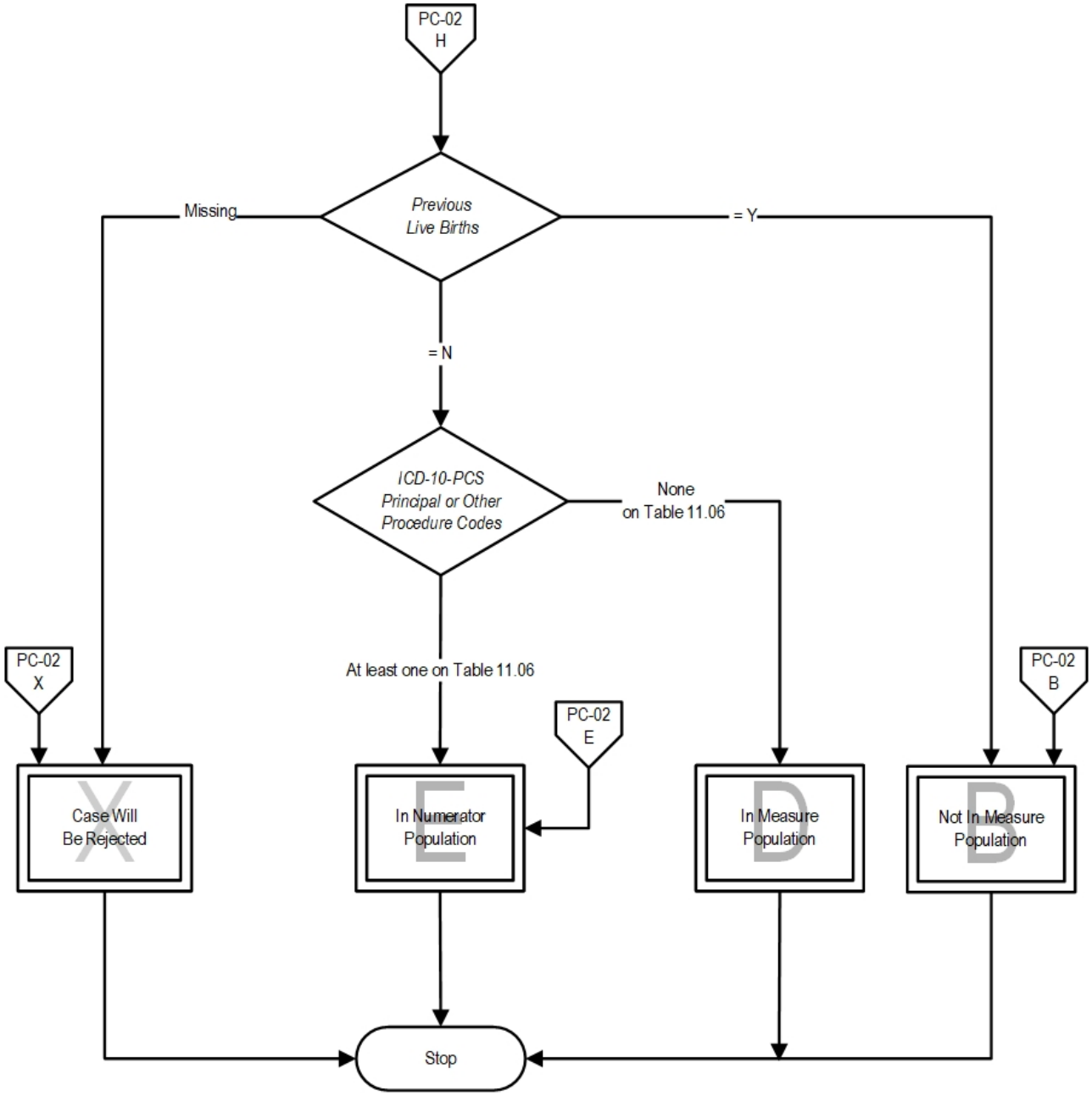
Measure Algorithm:

PC-02: Cesarean Birth

Numerator: Patients with cesarean births

Denominator: Nulliparous patients delivered of a live term singleton newborn in vertex presentation





Measure Information Form PC-02

Specifications Manual for Joint Commission National Quality Measures (v2019A)
Discharges 07-01-19 (3Q19) through 12-31-19 (4Q19)

 Questions? Ask Question to Joint Commission staff

eCQM Title	**Child and Adolescent Major Depressive Disorder (MDD): Suicide Risk Assessment**		
eCQM Identifier (Measure Authoring Tool)	177	**eCQM Version number**	7.2.000
NQF Number	1365	**GUID**	848d09de-7e6b-43c4-bedd-5a2957ccffe3
Measurement Period	January 1, 20XX through December 31, 20XX		
Measure Steward	PCPI(R) Foundation (PCPI[R])		
Measure Developer	American Medical Association (AMA)		
Measure Developer	PCPI(R) Foundation (PCPI[R])		
Endorsed By	National Quality Forum		
Description	Percentage of patient visits for those patients aged 6 through 17 years with a diagnosis of major depressive disorder with an assessment for suicide risk		
Copyright	Copyright 2018 PCPI(R) Foundation and American Medical Association. All Rights Reserved.		
Disclaimer	The Measure is not a clinical guideline, does not establish a standard of medical care, and has not been tested for all potential applications. The Measure, while copyrighted, can be reproduced and distributed, without modification, for noncommercial purposes, eg, use by health care providers in connection with their practices. Commercial use is defined as the sale, license, or distribution of the Measure for commercial gain, or incorporation of the Measure into a product or service that is sold, licensed or distributed for commercial gain. Commercial uses of the Measure require a license agreement between the user and the PCPI(R) Foundation (PCPI[R]) or the American Medical Association (AMA). Neither the AMA, nor the former AMA-convened Physician Consortium for Performance Improvement(R) (AMA-PCPI), nor PCPI, nor their members shall be responsible for any use of the Measure. AMA and PCPI encourage use of the Measure by other health care professionals, where appropriate. THE MEASURE AND SPECIFICATIONS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. Limited proprietary coding is contained in the Measure specifications for convenience. Users of the proprietary code sets should obtain all necessary licenses from the owners of these code sets. The AMA, the PCPI and its members and former members of the AMA-PCPI disclaim all liability for use or accuracy of any Current Procedural Terminology (CPT[R]) or other coding contained in the specifications. CPT(R) contained in the Measure specifications is copyright 2004-2017 American Medical Association. LOINC(R) is copyright 2004-2017 Regenstrief Institute, Inc. This material contains SNOMED Clinical Terms(R) (SNOMED CT[R]) copyright 2004-2017 International Health Terminology Standards Development Organisation. ICD-10 is copyright 2017 World Health Organization. All Rights Reserved. Due to technical limitations, registered trademarks are indicated by (R) or [R].		
Measure Scoring	Proportion		
Measure Type	Process		
Stratification	None		
Risk Adjustment	None		
Rate Aggregation	None		
Rationale	Research has shown that patients with major depressive disorder are at a high risk for suicide attempts and completion - among the most significant and devastating sequelae of the disease. Suicide risk is a critical consideration in children and adolescents with MDD and an important aspect of care that should be assessed at each visit and subsequently managed to minimize that risk. Additionally, the importance of the assessments is underscored by research that indicates that many individuals who die by suicide do make contact with primary care providers and mental health services beforehand. More specifically, approximately 15% of suicide victims aged 35 years or younger had seen a mental health professional within 1 month of suicide while approximately 23% had seen a primary care provider within 1 month of suicide.		
Clinical Recommendation Statement	The evaluation must include assessment for the presence of harm to self or others (MS). (AACAP, 2007) Suicidal behavior exists along a continuum from passive thoughts of death to a clearly developed plan and intent to carry out that plan. Because depression is closely associated with suicidal thoughts and behavior, it is imperative to evaluate these symptoms at the initial and subsequent assessments. For this purpose, low burden tools to track suicidal ideation and behavior such as the Columbia-Suicidal Severity Rating Scale can be used. Also, it is crucial to evaluate the risk (eg, age, sex, stressors, comorbid conditions, hopelessness, impulsivity) and protective factors (eg, religious belief, concern not to hurt family) that might influence the desire to attempt suicide. The risk for suicidal behavior increases if there is a history of suicide attempts, comorbid psychiatric disorders (eg, disruptive disorders, substance abuse), impulsivity and aggression, availability of lethal agents (eg, firearms), exposure to negative events (eg, physical or sexual abuse, violence), and a family history of suicidal behavior. (AACAP, 2007) A careful and ongoing evaluation of suicide risk is necessary for all patients with major depressive disorder (Category I). Such an assessment includes specific inquiry about suicidal thoughts, intent, plans, means, and behaviors; identification of specific psychiatric symptoms (eg, psychosis, severe anxiety, substance use) or general medical conditions that may increase the likelihood of acting on suicidal ideas; assessment of past and, particularly, recent suicidal behavior; delineation of current stressors and potential protective factors (eg, positive reasons for living, strong social support); and identification of any family history of suicide or mental illness (Category I). (APA, 2010, Reaffirmed 2015)		
Improvement Notation	Higher score indicates better quality		
Reference	American Academy of Child and Adolescent Psychiatry (AACAP). Practice parameters for the assessment and treatment of children and adolescents with depressive disorders. J. Am. Acad. Child Adolesc. Psychiatry, 2007; 46(11):1503-1526. Available at: http://www.aacap.org/App_Themes/AACAP/docs/practice_parameters/depressive_disorders_practice_parameter.pdf		
Reference	Gelenberg AJ, Freeman MP, Markowitz JC, et al; American Psychiatric Association Work Group on Major Depressive Disorder. Practice guideline for the treatment of patients with major depressive disorder. 3rd ed. http://psychiatryonline.org/pb/assets/raw/sitewide/practice_guidelines/guidelines/mdd.pdf. Published October 2010. Reaffirmed October 2015. Accessed October 17, 2017.		
Reference	Luoma JB, Martin CE, Pearson JL. Contact with mental health and primary care providers before suicide: a review of the evidence. Am J Psychiatry. 2002;159:909-916.		
Definition	Numerator Definition: The specific type and magnitude of the suicide risk assessment is intended to be at the discretion of the individual clinician and should be specific to the needs of the patient. At a minimum, suicide risk assessment should evaluate: 1. Risk (eg, age, sex, stressors, comorbid conditions, hopelessness, impulsivity) and protective factors (eg, religious belief, concern not to hurt family) that may influence the desire to attempt suicide. 2. Current severity of suicidality.		

	3. Most severe point of suicidality in episode and lifetime. Low burden tools to track suicidal ideation and behavior such as the Columbia-Suicidal Severity Rating Scale can also be used.
Guidance	A suicide risk assessment should be performed at every visit for major depressive disorder during the measurement period. This measure is an episode-of-care measure; the level of analysis for this measure is every visit for major depressive disorder during the measurement period. For example, at every visit for MDD, the patient should have a suicide risk assessment. Use of a standardized tool or instrument to assess suicide risk will meet numerator performance. Standardized tools can be mapped to the concept "Intervention, Performed": "Suicide risk assessment (procedure)" included in the numerator logic below.
Transmission Format	TBD
Initial Population	All patient visits for those patients aged 6 through 17 years with a diagnosis of major depressive disorder
Denominator	Equals Initial Population
Denominator Exclusions	None
Numerator	Patient visits with an assessment for suicide risk
Numerator Exclusions	Not Applicable
Denominator Exceptions	None
Supplemental Data Elements	For every patient evaluated by this measure also identify payer, race, ethnicity and sex

Table of Contents

Population Criteria

Initial Population

```
"Major Depressive Disorder Encounter" MDDEncounter
    with ["Patient Characteristic Birthdate"] BirthDate
        such that Global."CalendarAgeInYearsAt"(BirthDate.birthDatetime, start of "Measurement Period")>= 6
            and Global."CalendarAgeInYearsAt"(BirthDate.birthDatetime, start of "Measurement Period")< 17
```

Denominator

```
"Initial Population"
```

Denominator Exclusions

None

Numerator

```
"Major Depressive Disorder Encounter" MDDEncounter
    with ["Intervention, Performed": "Suicide risk assessment (procedure)"] SuicideRiskAssessment
        such that SuicideRiskAssessment.relevantPeriod during MDDEncounter.relevantPeriod
```

Numerator Exclusions

None

Denominator Exceptions

None

Stratification

None

Definitions

Denominator

```
"Initial Population"
```

Initial Population

```
"Major Depressive Disorder Encounter" MDDEncounter
    with ["Patient Characteristic Birthdate"] BirthDate
        such that Global."CalendarAgeInYearsAt"(BirthDate.birthDatetime, start of "Measurement Period")>= 6
            and Global."CalendarAgeInYearsAt"(BirthDate.birthDatetime, start of "Measurement Period")< 17
```

Major Depressive Disorder Encounter

```
( ["Encounter, Performed": "Office Visit"]
    union ["Encounter, Performed": "Outpatient Consultation"]
    union ["Encounter, Performed": "Psych Visit - Diagnostic Evaluation"]
    union ["Encounter, Performed": "Psych Visit - Family Psychotherapy"]
    union ["Encounter, Performed": "Psych Visit - Psychotherapy"]
    union ["Encounter, Performed": "Psychoanalysis"]
    union ["Encounter, Performed": "Group Psychotherapy"] ) ValidEncounter
    where exists ( ValidEncounter.diagnoses EncounterDiagnosis
            where EncounterDiagnosis in "Major Depressive Disorder-Active"
    )
        and ValidEncounter.relevantPeriod during "Measurement Period"
```

Numerator

"Major Depressive Disorder Encounter" MDDEncounter
with ["Intervention, Performed": "Suicide risk assessment (procedure)"] SuicideRiskAssessment
such that SuicideRiskAssessment.relevantPeriod during MDDEncounter.relevantPeriod

SDE Ethnicity

["Patient Characteristic Ethnicity": "Ethnicity"]

SDE Payer

["Patient Characteristic Payer": "Payer"]

SDE Race

["Patient Characteristic Race": "Race"]

SDE Sex

["Patient Characteristic Sex": "ONC Administrative Sex"]

Functions

Global.CalendarAgeInYearsAt(BirthDateTime DateTime, AsOf DateTime)

years between ToDate(BirthDateTime)and ToDate(AsOf)

Global.ToDate(Value DateTime)

DateTime(year from Value, month from Value, day from Value, 0, 0, 0, 0, timezone from Value)

Terminology

- codesystem "SNOMEDCT" using "2.16.840.1.113883.6.96 version 2017-09"
- code "Suicide risk assessment (procedure)" using "SNOMEDCT version 2017-09 Code (225337009)"
- valueset "Ethnicity" using "2.16.840.1.114222.4.11.837"
- valueset "Group Psychotherapy" using "2.16.840.1.113883.3.526.3.1187"
- valueset "Major Depressive Disorder-Active" using "2.16.840.1.113883.3.526.3.1491"
- valueset "Office Visit" using "2.16.840.1.113883.3.464.1003.101.12.1001"
- valueset "ONC Administrative Sex" using "2.16.840.1.113762.1.4.1"
- valueset "Outpatient Consultation" using "2.16.840.1.113883.3.464.1003.101.12.1008"
- valueset "Payer" using "2.16.840.1.114222.4.11.3591"
- valueset "Psych Visit - Diagnostic Evaluation" using "2.16.840.1.113883.3.526.3.1492"
- valueset "Psych Visit - Family Psychotherapy" using "2.16.840.1.113883.3.526.3.1018"
- valueset "Psych Visit - Psychotherapy" using "2.16.840.1.113883.3.526.3.1496"
- valueset "Psychoanalysis" using "2.16.840.1.113883.3.526.3.1141"
- valueset "Race" using "2.16.840.1.114222.4.11.836"

Data Criteria (QDM Data Elements)

- "Encounter, Performed: Group Psychotherapy" using "Group Psychotherapy (2.16.840.1.113883.3.526.3.1187)"
- "Encounter, Performed: Office Visit" using "Office Visit (2.16.840.1.113883.3.464.1003.101.12.1001)"
- "Encounter, Performed: Outpatient Consultation" using "Outpatient Consultation (2.16.840.1.113883.3.464.1003.101.12.1008)"
- "Encounter, Performed: Psych Visit - Diagnostic Evaluation" using "Psych Visit - Diagnostic Evaluation (2.16.840.1.113883.3.526.3.1492)"
- "Encounter, Performed: Psych Visit - Family Psychotherapy" using "Psych Visit - Family Psychotherapy (2.16.840.1.113883.3.526.3.1018)"
- "Encounter, Performed: Psych Visit - Psychotherapy" using "Psych Visit - Psychotherapy (2.16.840.1.113883.3.526.3.1496)"
- "Encounter, Performed: Psychoanalysis" using "Psychoanalysis (2.16.840.1.113883.3.526.3.1141)"
- "Patient Characteristic Ethnicity: Ethnicity" using "Ethnicity (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic Payer: Payer" using "Payer (2.16.840.1.114222.4.11.3591)"
- "Patient Characteristic Race: Race" using "Race (2.16.840.1.114222.4.11.836)"
- "Patient Characteristic Sex: ONC Administrative Sex" using "ONC Administrative Sex (2.16.840.1.113762.1.4.1)"
- "Intervention, Performed: Suicide risk assessment (procedure)" using "Suicide risk assessment (procedure) (SNOMEDCT version 2017-09 Code 225337009)"

Supplemental Data Elements

SDE Ethnicity

["Patient Characteristic Ethnicity": "Ethnicity"]

SDE Payer

["Patient Characteristic Payer": "Payer"]

SDE Race

["Patient Characteristic Race": "Race"]

SDE Sex

["Patient Characteristic Sex": "ONC Administrative Sex"]

Risk Adjustment Variables

None

Measure Set	None

Childhood Immunization Status (CIS)

SUMMARY OF CHANGES TO HEDIS 2020

- Modified value sets to make them compatible with digital measure formatting.
- Added live attenuated influenza vaccine (LAIV) as numerator compliant for the influenza rate.
- Reformatted/reorganized the MMR numerator (MMR numerator requirements were not changed).
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of children 2 years of age who had four diphtheria, tetanus and acellular pertussis (DTaP); three polio (IPV); one measles, mumps and rubella (MMR); three haemophilus influenza type B (HiB); three hepatitis B (HepB), one chicken pox (VZV); four pneumococcal conjugate (PCV); one hepatitis A (HepA); two or three rotavirus (RV); and two influenza (flu) vaccines by their second birthday. The measure calculates a rate for each vaccine and nine separate combination rates.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicaid (report each product line separately).
Age	Children who turn 2 years of age during the measurement year.
Continuous enrollment	12 months prior to the child's second birthday.
Allowable gap	No more than one gap in enrollment of up to 45 days during the 12 months prior to the child's second birthday. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not continuously enrolled).
Anchor date	Enrolled on the child's second birthday.
Benefit	Medical.
Event/diagnosis	None.

Administrative Specification

Denominator	The eligible population.
Numerators	For MMR, hepatitis B, VZV and hepatitis A, count any of the following: • Evidence of the antigen or combination vaccine, ***or*** • Documented history of the illness, ***or***

- A seropositive test result for each antigen.

For DTaP, IPV, HiB, pneumococcal conjugate, rotavirus and influenza, count only:

- Evidence of the antigen or combination vaccine.

For combination vaccinations that require more than one antigen (i.e., DTaP and MMR), the organization must find evidence of all the antigens.

DTaP At least four DTaP vaccinations (DTaP Immunization Value Set; DTaP Vaccine Procedure Value Set), with different dates of service on or before the child's second birthday. Do not count a vaccination administered prior to 42 days after birth.

IPV At least three IPV vaccinations (Inactivated Polio Vaccine (IPV) Immunization Value Set; Inactivated Polio Vaccine (IPV) Procedure Value Set), with different dates of service on or before the child's second birthday. Do not count a vaccination administered prior to 42 days after birth.

MMR Any of the following meet criteria:

- At least one MMR vaccination (Measles, Mumps and Rubella (MMR) Immunization Value Set; Measles, Mumps and Rubella (MMR) Vaccine Procedure Value Set) on or between the child's first and second birthdays.
- At least one measles and rubella vaccination (Measles Rubella Immunization Value Set; Measles Rubella Vaccine Procedure Value Set) ***and*** one of the following:
  - At least one mumps vaccination (Mumps Immunization Value Set; Mumps Vaccine Procedure Value Set) on or between the child's first and second birthdays.
  - History of mumps illness (Mumps Value Set) any time on or before the child's second birthday.
- Any combination of codes from the table below that indicates evidence of all three antigens (on the same or different date of service).

Measles (any of the following)	Mumps (any of the following)	Rubella (any of the following)
• At least one measles vaccination (Measles Immunization Value Set; Measles Vaccine Procedure Value Set) administered on or between the child's first and second birthdays.	• At least one mumps vaccination (Mumps Immunization Value Set; Mumps Vaccine Procedure Value Set) administered on or between the child's first and second birthdays.	• At least one rubella vaccination (Rubella Immunization Value Set; Rubella Vaccine Procedure Value Set) administered on or between the child's first and second birthdays.
• History of measles (Measles Value Set) illness anytime on or before the child's second birthday.	• History of mumps (Mumps Value Set) illness anytime on or before the child's second birthday.	• History of rubella (Rubella Value Set) illness anytime on or before the child's second birthday.

Note: *General Guideline 36: Collecting Data for Measures With Multiple Numerator Events (i.e., the 14-day rule) does not apply to MMR.*

HiB At least three HiB vaccinations (Haemophilus Influenzae Type B (HiB) Immunization Value Set; Haemophilus Influenzae Type B (HiB) Vaccine Procedure Value Set), with different dates of service on or before the child's second birthday. Do not count a vaccination administered prior to 42 days after birth.

Hepatitis B Any of the following on or before the child's second birthday meet criteria:

- At least three hepatitis B vaccinations (Hepatitis B Immunization Value Set; Hepatitis B Vaccine Procedure Value Set), with different dates of service.
  - One of the three vaccinations can be a newborn hepatitis B vaccination (Newborn Hepatitis B Vaccine Administered Value Set) during the eight-day period that begins on the date of birth and ends seven days after the date of birth. For example, if the member's date of birth is December 1, the newborn hepatitis B vaccination must be on or between December 1 and December 8.
- History of hepatitis illness (Hepatitis B Value Set).

VZV Either of the following meets criteria:

- At least one VZV vaccination (Varicella Zoster (VZV) Immunization Value Set; Varicella Zoster (VZV) Vaccine Procedure Value Set), with a date of service on or between the child's first and second birthdays.
- History of varicella zoster (e.g., chicken pox) illness (Varicella Zoster Value Set) on or before the child's second birthday.

Pneumococcal conjugate At least four pneumococcal conjugate vaccinations (Pneumococcal Conjugate Immunization Value Set; Pneumococcal Conjugate Vaccine Procedure Value Set), with different dates of service on or before the child's second birthday. Do not count a vaccination administered prior to 42 days after birth.

Hepatitis A Either of the following meets criteria:

- At least one hepatitis A vaccination (Hepatitis A Immunization Value Set; Hepatitis A Vaccine Procedure Value Set), with a date of service on or between the child's first and second birthdays.
- History of hepatitis A illness (Hepatitis A Value Set) on or before the child's second birthday.

Rotavirus Any of the following on or before the child's second birthday meet criteria. Do not count a vaccination administered prior to 42 days after birth.

- At least two doses of the two-dose rotavirus vaccine (Rotavirus (2 Dose Schedule) Immunization Value Set; Rotavirus Vaccine (2 Dose Schedule) Procedure Value Set) on different dates of service.
- At least three doses of the three-dose rotavirus vaccine (Rotavirus (3 Dose Schedule) Immunization Value Set; Rotavirus Vaccine (3 Dose Schedule) Procedure Value Set) on different dates of service.
- At least one dose of the two-dose rotavirus vaccine (Rotavirus (2 Dose Schedule) Immunization Value Set; Rotavirus (2 Dose Schedule) Procedure Value Set) and at least two doses of the three-dose rotavirus vaccine (Rotavirus (3 Dose Schedule) Immunization Value Set; Rotavirus Vaccine (3 Dose Schedule) Procedure Value Set), all on different dates of service.

Influenza At least two influenza vaccinations (Influenza Immunization Value Set; Influenza Vaccine Procedure Value Set; Influenza Virus LAIV Immunization Value Set; Influenza Virus LAIV Vaccine Procedure Value Set), with different dates of service on or before the child's second birthday. Do not count a vaccination administered prior to 6 months (180 days) after birth.

Combination rates Calculate the following rates for Combination 2–Combination 10.

Combination Vaccinations for Childhood Immunization Status

Combination	DTaP	IPV	MMR	HiB	HepB	VZV	PCV	HepA	RV	Influenza
Combination 2	✓	✓	✓	✓	✓	✓				
Combination 3	✓	✓	✓	✓	✓	✓	✓			
Combination 4	✓	✓	✓	✓	✓	✓	✓	✓		
Combination 5	✓	✓	✓	✓	✓	✓	✓		✓	
Combination 6	✓	✓	✓	✓	✓	✓	✓			✓
Combination 7	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Combination 8	✓	✓	✓	✓	✓	✓	✓	✓		✓
Combination 9	✓	✓	✓	✓	✓	✓	✓		✓	✓
Combination 10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Exclusion *(optional)*

- Exclude children who had a contraindication for a specific vaccine from the denominator for all antigen rates and the combination rates. The denominator for all rates must be the same.
- Exclude contraindicated children only if administrative data do not indicate that the contraindicated immunization was rendered in its entirety.

Any of the following on or before the member's second birthday meet optional exclusion criteria:

Any particular vaccine
- Anaphylactic reaction to the vaccine or its components (Anaphylactic Reaction Due To Vaccination Value Set).

DTaP
- Encephalopathy (Encephalopathy Due To Vaccination Value Set) ***with*** a vaccine adverse-effect code (Vaccine Causing Adverse Effect Value Set).

MMR, VZV and influenza
- Immunodeficiency (Disorders of the Immune System Value Set).
- HIV (HIV Value Set; HIV Type 2 Value Set).
- Lymphoreticular cancer, multiple myeloma or leukemia (Malignant Neoplasm of Lymphatic Tissue Value Set).
- Anaphylactic reaction to neomycin.

Rotavirus
- Severe combined immunodeficiency (Severe Combined Immunodeficiency Value Set).
- History of intussusception (Intussusception Value Set).

IPV
- Anaphylactic reaction to streptomycin, polymyxin B or neomycin.

Hepatitis B

- Anaphylactic reaction to common baker's yeast.

Hybrid Specification

Denominator

A systematic sample drawn from the eligible population for each product line. Organizations may reduce the sample size using the current year's administrative rate for the lowest rate or the prior year's audited, product line-specific results for the lowest rate. Refer to the *Guidelines for Calculations and Sampling* for information on reducing sample size.

Numerators

For MMR, hepatitis B, VZV and hepatitis A, count any of the following:

- Evidence of the antigen or combination vaccine.
- Documented history of the illness.
- A seropositive test result.

For DTaP, HiB, IPV, pneumococcal conjugate, rotavirus and influenza, count *only*:

- Evidence of the antigen or combination vaccine.

For combination vaccinations that require more than one antigen (i.e., DTaP and MMR), the organization must find evidence of all the antigens.

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record

For immunization evidence obtained from the medical record, count members where there is evidence that the antigen was rendered from one of the following:

- A note indicating the name of the specific antigen and the date of the immunization.
- A certificate of immunization prepared by an authorized health care provider or agency including the specific dates and types of immunizations administered.

For documented history of illness or a seropositive test result, there must be a note indicating the date of the event, which must have occurred by the member's second birthday.

Notes in the medical record indicating that the member received the immunization "at delivery" or "in the hospital" may be counted toward the numerator *only* for immunizations that do not have minimum age restrictions (e.g., before 42 days after birth). A note that the "member is up to date" with all immunizations but which does not list the dates of all immunizations and the names of the immunization agents does not constitute sufficient evidence of immunization for HEDIS reporting.

Immunizations documented using a generic header or "DTaP/DTP/DT" can be counted as evidence of DTaP. The burden on organizations to substantiate the DTaP antigen is excessive compared to a risk associated with data integrity.

Immunizations documented using a generic header (e.g., polio vaccine) or "IPV/OPV" can be counted as evidence of IPV. The burden on organizations to

substantiate the IPV antigen is excessive compared to a risk associated with data integrity.

For rotavirus, if documentation does not indicate whether the two-dose schedule or three-dose schedule was used, assume a three-dose schedule and find evidence that three doses were administered.

Exclusion *(optional)*

Refer to *Administrative Specification* for exclusion criteria. The exclusion must have occurred by the member's second birthday.

Note

- *This measure follows the CDC and ACIP guidelines for immunizations.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table CIS-1/2: Data Elements for Childhood Immunization Status

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		*Each of the 19 rates*
Current year's administrative rate (before exclusions)		*Each of the 19 rates*
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		*Each of the 19 rates*
Administrative rate on MRSS		*Each of the 19 rates*
Number of medical records excluded because of valid data errors		✓
Number of administrative data records excluded		✓
Number of medical record data records excluded		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	*Each of the 19 rates*	*Each of the 19 rates*
Numerator events by medical records		*Each of the 19 rates*
Numerator events by supplemental data	*Each of the 19 rates*	*Each of the 19 rates*
Reported rate	*Each of the 19 rates*	*Each of the 19 rates*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Childhood Immunization Status

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age 2 as of June 30"). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefit	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	NA	There is no event/diagnosis for this measure.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• DTAP • IPV • MMR • HiB • Hepatitis B • VZV • Pneumococcal conjugate • Hepatitis A • Rotavirus • Influenza	No	Value sets and logic may not be changed. Vaccine dose requirements may not be changed.
• Combination Rates	Yes, with limits	Organizations are not required to calculate combination rates; alternate combinations of specified immunizations are allowed.

Chlamydia Screening in Women (CHL)

SUMMARY OF CHANGES TO HEDIS 2020

- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of women 16–24 years of age who were identified as sexually active and who had at least one test for chlamydia during the measurement year.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product lines
Commercial, Medicaid (report each product line separately).

Ages
Women 16–24 years as of December 31 of the measurement year. Report two age stratifications and a total rate:

- 16–20 years.
- 21–24 years.
- Total.

The total is the sum of the age stratifications.

Continuous enrollment
The measurement year.

Allowable gap
No more than one gap in enrollment of up to 45 days during the measurement year. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).

Anchor date
December 31 of the measurement year.

Benefit
Medical.

Event/diagnosis
Sexually active. Two methods identify sexually active women: pharmacy data and claim/encounter data. The organization must use both methods to identify the eligible population; however, a member only needs to be identified in one method to be eligible for the measure.

Claim/encounter data. Members who had a claim or encounter indicating sexual activity during the measurement year. A code from any of the following meets criteria:

- Pregnancy Value Set.
- Sexual Activity Value Set.
- Pregnancy Tests Value Set.

Pharmacy data. Members who were dispensed prescription contraceptives during the measurement year (Contraceptive Medications List).

Contraceptive Medications

Description	Prescription	
Contraceptives	• Desogestrel-ethinyl estradiol • Dienogest-estradiol multiphasic • Drospirenone-ethinyl estradiol • Drospirenone-ethinyl estradiol-levomefolate biphasic • Ethinyl estradiol-ethynodiol • Ethinyl estradiol-etonogestrel • Ethinyl estradiol-folic acid-levonorgestrel • Ethinyl estradiol-levonorgestrel	• Ethinyl estradiol-norelgestromin • Ethinyl estradiol-norethindrone • Ethinyl estradiol-norgestimate • Ethinyl estradiol-norgestrel • Etonogestrel • Levonorgestrel • Medroxyprogesterone • Mestranol-norethindrone • Norethindrone
Diaphragm	• Diaphragm	
Spermicide	• Nonoxynol 9	

Administrative Specification

Denominator The eligible population.

Numerator At least one chlamydia test (Chlamydia Tests Value Set) during the measurement year.

Exclusion *(optional)*

Exclude members who qualified for the denominator based on a pregnancy test (Pregnancy Tests Value Set) alone ***and*** who meet either of the following:

- A pregnancy test (Pregnancy Test Exclusion Value Set) during the measurement year and a prescription for isotretinoin (Retinoid Medications List) on the date of the pregnancy test or the six days after the pregnancy test.
- A pregnancy test (Pregnancy Test Exclusion Value Set) during the measurement year and an x-ray (Diagnostic Radiology Value Set) on the date of the pregnancy test or the six days after the pregnancy test.

Retinoid Medications

Description	Prescription
Retinoid	• Isotretinoin

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table CHL-1/2: Data Elements for Chlamydia Screening in Women

	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	*For each age stratification and total*
Number of optional exclusions	*For each age stratification and total*
Numerator events by administrative data	*For each age stratification and total*
Numerator events by supplemental data	*For each age stratification and total*
Reported rate	*For each age stratification and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Chlamydia Screening in Women

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	The age determination dates may be changed (e.g., select, "age as of June 30"). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are acceptable.
Benefit	Yes	Organizations are not required to use a benefit; adjustments are acceptable.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	Yes, with limits	Only events that contain (or map to) codes in medication lists and value sets may be used to identify sexual activity. Medication lists, value sets and logic may not be changed. Claims/encounter data or pharmacy data may be used to identify sexual activity.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Medication lists, and value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Chlamydia test	No	Value sets and logic may not be changed.

Multidrug-Resistant Organism & *Clostridioides difficile* Infection (MDRO/CDI) Module

Table of Contents

Background: Methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* spp. (VRE), and certain gram-negative bacilli have increased in prevalence in U.S. hospitals over the last three decades, and have important implications for patient safety. There is concern about these multidrug-resistant organisms (MDROs) as options for treating patients with these infections are often extremely limited, and MDRO infections are associated with increased lengths of stay, costs, and mortality. Many of these traits have also been observed for *Clostridioides difficile* infection (CDI). The Healthcare Infection Control Practices Advisory Committee (HICPAC) has approved guidelines for the control of MDROs. [1] These guidelines are available at https://www.cdc.gov/infectioncontrol/guidelines/MDRO/index.html). The MDRO and *C. difficile* module of NHSN can provide a tool to assist facilities in meeting some of the criteria outlined in the guidelines. In addition, many of the metrics used in this module are consistent with "Recommendations for Metrics for Multidrug-Resistant Organisms in Healthcare Settings: SHEA/HICPAC Position Paper."[2]

Clostridioides difficile (C. difficile) is responsible for a spectrum of *C. difficile* infections (CDI), including uncomplicated diarrhea, pseudomembranous colitis, and toxic megacolon, which can, in some instances, lead to sepsis and even death. Although CDI represents a subset of gastrointestinal tract infections in the current CDC definitions for HAIs, specific standard definitions for CDI [3] should be incorporated to obtain a more complete understanding of how *C. difficile* is being transmitted in a healthcare facility.

As outlined in the HICPAC guideline[1], these MDRO and *C. difficile* pathogens may require specialized monitoring to evaluate if intensified infection control efforts are required to reduce the occurrence of these organisms and related infections. The **goal** of this module is to provide a mechanism for facilities to report and analyze these data that will inform infection prevention professionals of the impact of targeted prevention efforts.

This module contains two core reporting options for MDRO and *C. difficile* – Laboratory Identified (LabID) Event reporting and Infection Surveillance reporting. These reporting options function as two separate and independent reporting methods - one focused on laboratory based reporting and the second on infection criteria based surveillance reporting. Reporting options are summarized in Table 1. Participants may choose either one or both of these reporting options and then may also choose to participate in any of the supplemental monitoring methods described in Table 1.

See Appendix 3: *Differentiating Between LabID Event and Infection Surveillance* for key differences between the two options.

Table 1. Core and Supplemental Reporting Choices for MDRO and CDI Module

Reporting Choices	MDRO			CDI
	MRSA or MRSA/MSSA	**VRE**	**CephR-*Klebsiella*, CRE (*E. coli, Enterobacter, Klebsiella*), *Acinetobacter* spp. (MDR)**	***C. difficile***
Core	**Method**	**Method**	**Method**	**Method**
Proxy Infection Measures LabID Event Choose ≥1 organism	A, B, C, D	A, B, C, D	A, B, C, D	±A, B, C
AND/OR				
Infection Surveillance Choose ≥1 organism	A, B	A, B	A, B	±A, B
Supplemental	**Method**	**Method**	**Method**	**Method**
Prevention Process Measures Options: • Hand Hygiene Adherence	B	B	B	B
• Gown and Gloves Use Adherence	B	B	B	B
• Active Surveillance Testing (AST) Adherence	B	B	N/A	N/A
AST Outcome Measures • Incident and Prevalent Cases using AST	B	B	N/A	N/A

N/A – not available or contraindicated

±No surveillance for *C. difficile* will be performed in Neonatal Intensive Care Units (NICU), Specialty Care Nurseries (SCN), babies in LDRP (Labor, Delivery, Recovery, and Post-partum), well-baby nurseries, or well-baby clinics. And, if conducting facility-wide monitoring (Method C), the denominator counts (admissions, patient-days, encounters) for these locations must be removed.

Reporting Method (must choose to monitor by LabID Event or Infection Surveillance reporting before supplemental methods can also be used for monitoring):

A: **Facility-wide by location.** Report for each location separately and cover all locations in a facility. This reporting method requires the most effort, but provides the most detail for local and national statistical data.

B: **Selected locations within the facility (1 or more).** Report separately for one or more specific locations within a facility. This includes reporting individual events and denominator data for each of the selected locations. This reporting method is ideal for use during targeted prevention programs.

Note: *MDRO "Blood Specimens Only" monitoring is the only MDRO LabID event reporting option for IRF, ED and 24-hr Observation locations. For Inpatient locations other than IRF, ED and 24-hr Observation (examples: IPF, Medical, Surgical, etc.) 'All Specimens" monitoring is the only MDRO LabID event reporting option.*

C: **Overall facility-wide.** Report individual LabID events from each inpatient location and total denominator counts for the entire facility. Options include:

(1) Overall Facility-wide Inpatient (FacWideIN) to cover all inpatient locations where denominator data are collected. When using FacWideIN reporting, facilities must also include location specific reporting for outpatient emergency department (adult and pediatric) and 24-hr Observation location(s).

Note: *When following FacWideIN, facilities must enter denominators for all inpatient locations physically located in the hospital, as well as denominators for all inpatient locations minus any inpatient rehabilitation facility (IRF) and inpatient psychiatric facility (IPF) locations with separate CCNs. Totals reported should not include facilities affiliated with the hospital that are enrolled separately in NHSN. Additionally, separate denominator data will be required to capture encounters for each mapped emergency department and 24-hr observation location.*

(2) Overall Facility-wide Outpatient (FacWideOUT) to cover all outpatient locations affiliated with the facility where encounters are captured. Facilities may choose to monitor FacWideOUT in addition to FacWideIN monitoring.

D: **Overall facility-wide: *Blood Specimens* Only.** This method is available for MDRO LabID Events only and targets the most invasive events. Report individual LabID events from each inpatient location and total denominator counts for the entire facility. Options include:

(1) Overall Facility-wide Inpatient (FacWideIN) to cover all inpatient locations. Using this option, facilities must also include location specific reporting for each

outpatient emergency department (specifically, adult and pediatric) and 24-hr observation location(s).

Note: *When following FacWideIN, facilities must enter denominators for all inpatient locations physically located in the hospital, as well as denominators for all inpatient locations minus any inpatient rehabilitation facility (IRF) and inpatient psychiatric facility (IPF) locations with separate CCNs. Totals reported should not include facilities affiliated with the hospital that are enrolled separately in NHSN. Additionally, separate denominator data will be required to capture encounters for each mapped emergency department and 24-hr observation location.*

(2) Overall Facility-wide Outpatient (FacWideOUT) to cover all outpatient locations affiliated with the facility. Facilities may choose to monitor FacWideOUT in addition to FacWideIN monitoring.

Core Reporting

Option 1: Laboratory-Identified (LabID) Event Reporting

Introduction: LabID Event reporting option allows laboratory testing data to be used without clinical evaluation of the patient, and therefore is a much less labor-intensive method to track MDROs and *C. difficile*. These provide proxy infection measures of MDRO and/or *C. difficile* healthcare acquisition, exposure burden, and infection burden based almost exclusively on laboratory data and limited admission date data, including patient care location. LabID Event reporting is ONLY for collecting and tracking positive laboratory results (for example, positive cultures) that are collected for "clinical" purposes (specifically for diagnosis and treatment). This means that the results of laboratory specimens collected for active surveillance testing (AST) purposes only **should not** be reported as LabID Events.

Key points for LabID Event Reporting:

- LabID Events can be monitored at the overall facility-wide level for inpatient areas (FacWideIN), and/or at the overall facility-wide level for outpatient areas (FacWideOUT).
- At the Overall facility-wide levels and for IRF, ED, and 24-hour observation, MDROs can be monitored for *All Specimen* types or for *Blood Specimens Only*. All other locations can only monitor for *All Specimen* types.
- LabID Events can be monitored for specific locations and require unique denominator data from each of the specific locations (specifically, facility-wide locations monitored separately [Method A] allowing for both facility-wide and location-specific data, or by selected locations only [Method B]).
- A facility choosing to conduct FacWideIN surveillance for LabID Events must also follow location-specific surveillance for that same organism in each outpatient emergency department (pediatric and adult) and 24-hour observation location.

Laboratory and admission data can be used to calculate a variety of distinct proxy measures including: admission prevalence rate and overall patient prevalence rate (measures of exposure burden), MDRO bloodstream infection incidence rate (measure of infection burden and healthcare acquisition), overall MDRO infection/colonization incidence rate (measure of healthcare acquisition), and CD incidence rate (measure of infection burden and healthcare acquisition).

Use NHSN forms to collect all required data, using the definitions of each data field as indicated in the *Tables of Instructions*. When denominator data are available from electronic databases, these sources may be used only after a validation of a minimum 3 consecutive months proves the data to be within 5% (+/-) of the manually collected once-a-day counts.

MDRO LabID Event Reporting

Methodology: Facilities may choose to monitor one or more of the following MDROs: MRSA, MRSA and MSSA, VRE, CephR- *Klebsiella,* CRE, and/or multidrug-resistant *Acinetobacter* spp. (see definitions below). For *S. aureus*, both the resistant (MRSA) and the susceptible (MSSA) phenotypes can be tracked to provide concurrent measures of the susceptible pathogens as a comparison to those of the resistant pathogens in a setting of active MRSA prevention efforts.

Note: No Active Surveillance Culture/Testing (ASC/AST) results are to be included in this reporting of individual results (See *General Key Terms chapter*). Do NOT enter surveillance nasal swabs or other surveillance cultures as reports of LabID Events. AST tracking should be recorded under Process & Outcome Measures.

MDRO Definitions: MDROs included in this module are defined below.

MRSA:	Includes ***S. aureus*** cultured from any specimen that tests oxacillin-resistant, cefoxitin-resistant, or methicillin-resistant by standard susceptibility testing methods, or any laboratory finding of MRSA (includes but not limited to PCR or other molecular based detection methods).
MSSA:	***S. aureus*** cultured from a specimen testing intermediate or susceptible to oxacillin, cefoxitin, or methicillin by standard susceptibility testing method.
VRE:	***Enterococcus faecalis, Enterococcus faecium, or Enterococcus species unspecified*** *(only those not identified to the species level)* that is resistant to vancomycin, by standard susceptibility testing methods or a laboratory finding of VRE (includes but not limited to PCR or other molecular based detection methods).
CephR-*Klebsiella*:	***Klebsiella oxytoca or Klebsiella pneumoniae*** testing non-susceptible (specifically, either resistant or intermediate) to ceftazidime, cefotaxime, ceftriaxone, or cefepime.
CRE:	Any ***Escherichia coli***, ***Klebsiella oxytoca, Klebsiella pneumoniae***, or ***Enterobacter* spp**. testing resistant to imipenem, meropenem, doripenem, or ertapenem by standard susceptibility testing methods (specifically, minimum inhibitory concentrations of ≥4 mcg/mL for doripenem, imipenem and meropenem or ≥2 mcg/mL for ertapenem) OR by production of a carbapenemase (specifically, KPC, NDM, VIM, IMP, OXA-48) demonstrated using a recognized test (examples: polymerase chain reaction,

metallo-β-lactamase test, modified-Hodge test, Carba-NP). **Note**: For in-plan CRE surveillance, facilities must conduct surveillance for all three organisms CRE-*E.coli*, CRE-*Enterobacter*, **and** CRE-*Klebsiella (Klebsiella oxytoca* and *Klebsiella pneumoniae*).

MDR-*Acinetobacter:* Any ***Acinetobacter*** spp. testing non-susceptible (specifically, either resistant or intermediate) to at least one agent in at least 3 antimicrobial classes of the following 6 antimicrobial classes:

Class	Antimicrobial	Class	Antimicrobial
Aminoglycosides:	Amikacin Gentamicin Tobramycin	**β-lactam/β-lactam β-lactamase inhibitor combination:**	Piperacillin Piperacillin/tazobactam
Carbapenems:	Imipenem Meropenem Doripenem	**Cephalosporins:**	Cefepime Ceftazidime
Fluoroquinolones:	Ciprofloxacin Levofloxacin	**Sulbactam:**	Ampicillin/sulbactam

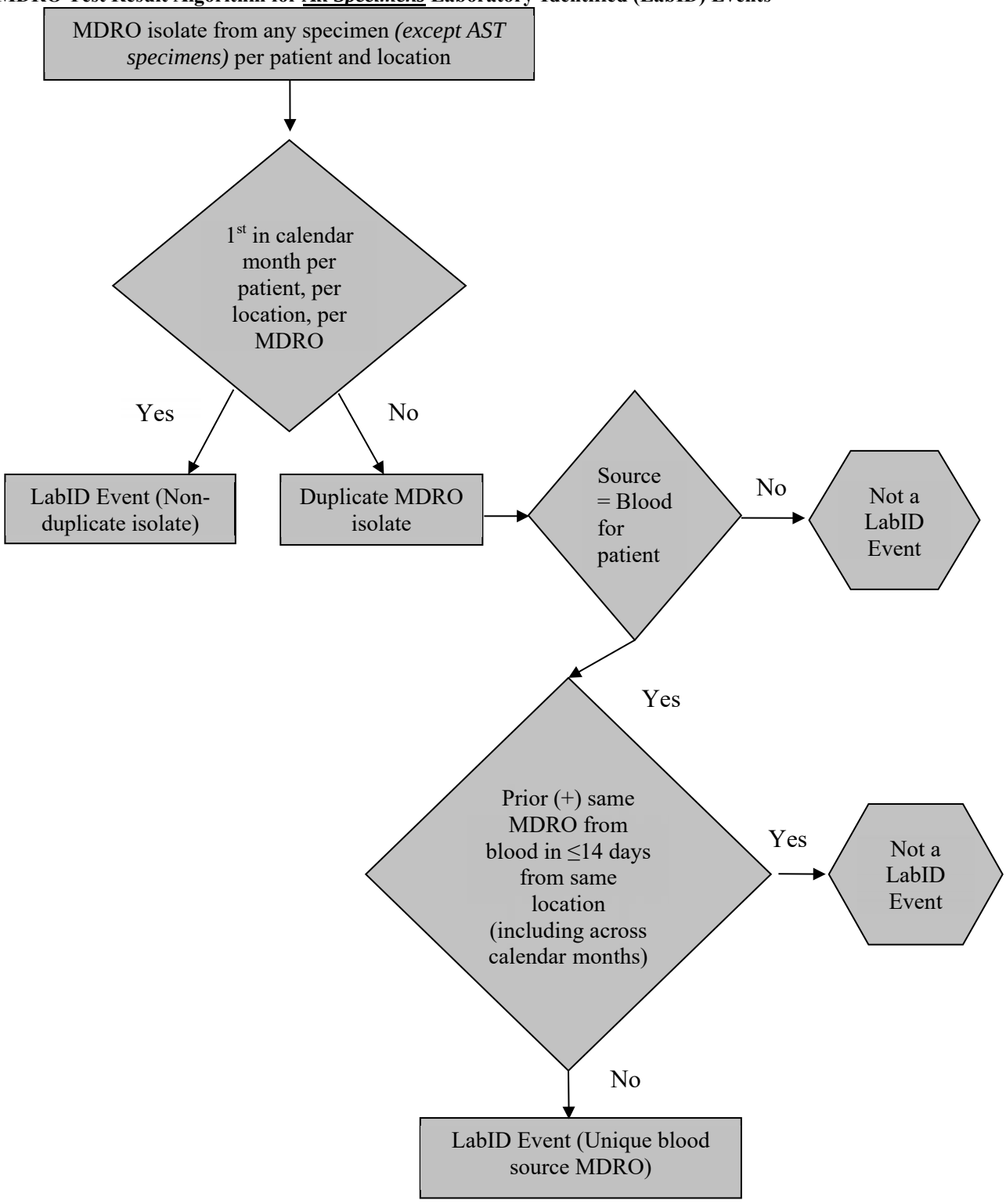
Settings: MDRO LabID Event reporting can occur in any location: inpatient or outpatient.

Requirements: Facilities choose at least one of the reporting methods listed below and report data accordingly:

Note: Facilities must indicate each reporting choice chosen for the calendar month on the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

For each MDRO being monitored, all MDRO test results are evaluated using either the algorithm in Figure 1 (*All Specimens*) or Figure 2 (*Blood Specimens only*) to determine reportable LabID events for each calendar month, and for each facility location as determined by the reporting method chosen. If monitoring *all specimens*, all first MDRO isolates (chronologically) per patient, per month, per location are reported as a LabID event regardless of specimen source [EXCLUDES tests related to active surveillance testing] (Figure 1); if a duplicate MDRO isolate is from blood, or if monitoring *blood specimens* only, it is reported as a LabID event only if it represents a unique blood source [specifically, no prior isolation of the MDRO in blood from the same patient and location in ≤2 weeks, even across calendar months] (Figures 1 & 2). As a general rule, at a maximum, there should be no more than 3 blood isolates reported, which would be very rare. If monitoring *all specimens* and a blood isolate is entered as the first specimen of the month, then no *non-blood* specimens can be entered that month for that patient and location. Report each LabID Event individually on a separate form.

Figure 1. MDRO Test Result Algorithm for *All Specimens* Laboratory-Identified (LabID) Events



**** *NOTE*: If the first MDRO isolate for calendar month is a blood isolate, the specimen is reported as a LabID event, even if a previous MDRO blood isolate was reported in the previous 14 days (across calendar months).**

Figure 2. MDRO Test Result Algorithm for *Blood Specimens Only* Laboratory-Identified (LabID) Events

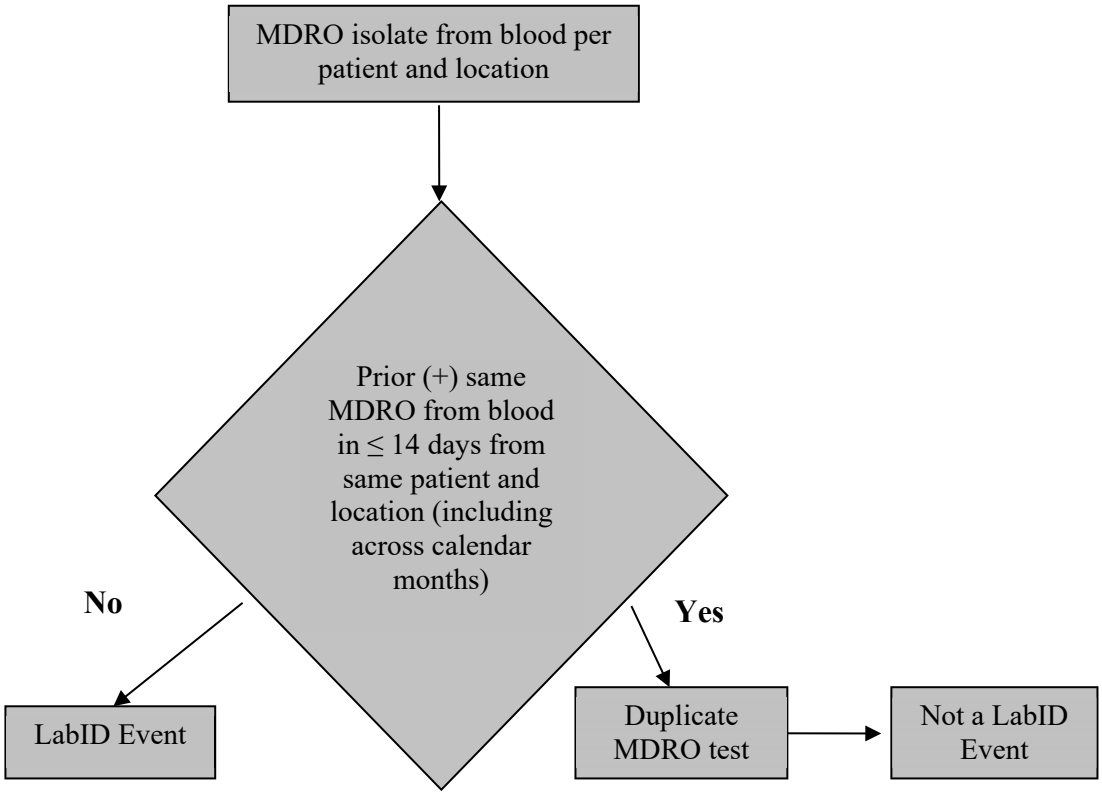


Table 2: Reporting Options for the MDRO Module (non-CDI)

Method	Numerator Data Reporting by Location	Denominator Data Reporting
Facility-wide by location **Note:** Must monitor *All Specimen* sources	Enter each MDRO LabID Event reported by location	Report separate denominators for each location in the facility as specified in the NHSN Monthly Reporting Plan
Selected locations **Note:** Must monitor *All Specimen* sources with the exception of IRF units, 24-hour observation, and emergency department	Enter each MDRO LabID Event reported by selected locations	Report separate denominators for each Selected location(s) monitored as specified in the NHSN Monthly Reporting Plan
Overall Facility-wide Inpatient (FacWideIN), *All Specimen*	Enter each MDRO LabID Specimen Event from all inpatient locations AND separately for outpatient emergency department, and 24-hour observation location(s)	Report total denominator data for **all inpatient locations** physically located in the hospital (for example, total number of admissions and total number of patient days), as well as denominators for all inpatient locations **minus** inpatient rehabilitation facility and inpatient psychiatric facility locations with separate CCNs • Separate denominators should be entered for each mapped outpatient emergency department and 24-hour observation location(s)
Overall Facility-wide Outpatient (FacWideOUT), *All Specimen*	Enter each MDRO LabID Event from all affiliated outpatient locations separately	Report total denominator data for **all outpatient locations** (for example, total number of encounters, including ED and OBS encounters in addition to other outpatient locations)
Overall Facility-wide Inpatient (FacWideIN), *Blood Specimen Only*	Enter each MDRO LabID Blood Specimen Event from all inpatient locations AND separately for outpatient emergency department, and 24-hour observation location(s)	Report total denominator data for **all inpatient locations** physically located in the hospital (for example, total number of admissions and total number of patient days), as well as denominators for all locations **minus** inpatient rehabilitation facility and inpatient psychiatric facility locations with separate CCNs • Separate denominators should be entered for each mapped outpatient emergency department and 24-hour observation location(s)
Overall Facility-wide Outpatient (FacWideOUT), *Blood Specimen Only*	Each MDRO LabID *Blood Specimen* Event from all affiliated outpatient locations by location	Total denominator data for **all outpatient locations** (for example, total number of encounters)

Definitions:

MDRO Isolate: Any specimen, obtained for clinical decision making, testing positive for an MDRO (as defined above). **Note**: Excludes tests related to active surveillance testing.

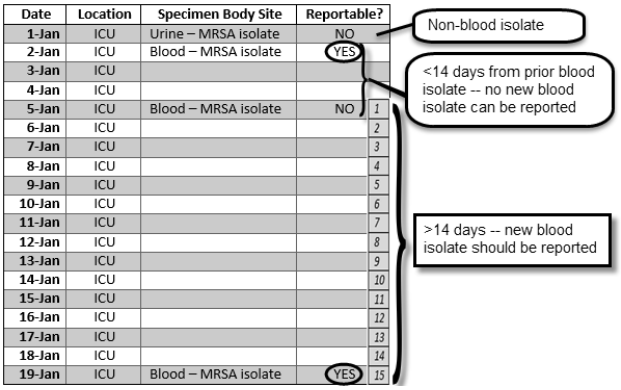
Duplicate MDRO Isolate: If monitoring *all specimens*, any subsequent MDRO isolate from the same patient and location after the first isolate of the specific MDRO during a calendar month, regardless of specimen source, except unique blood source (Figure 1).

> EXAMPLE: On January 2, a newly admitted ICU patient has a positive MRSA urine culture. The following week, while still in the ICU, the same patient has MRSA cultured from an infected decubitus ulcer. The MRSA wound culture is considered a duplicate MDRO isolate, since it is the second non-blood MRSA isolate collected from the same patient and location during the same calendar month.

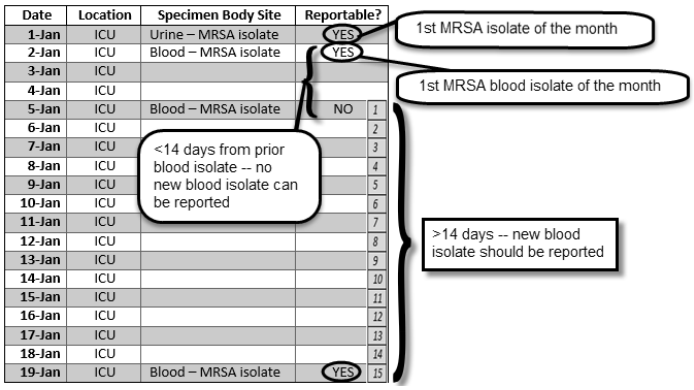
Unique Blood Source: A MDRO isolate from blood in a patient with no prior positive blood culture for the same MDRO and location in ≤14 days, even across calendar months and different facility admissions (Figure 2). There should be 14 days with no positive blood culture result for the patient, MDRO, and location before another Blood LabID Event is entered into NHSN for the patient, MDRO, and location. Additionally, if following *all specimens,* the first MDRO for the patient, month, and location should be reported. The date of specimen collection is considered Day 1.

Note: NHSN recommends that facilities keep an internal line listing log of all positive isolates for reference in LabID event reporting which will assist is decision making around the 14-day reporting rule which is location specific.

EXAMPLE: Monitoring *Blood Specimens only* with multiple isolates from same location	On January 1, an ICU patient has a positive MRSA urine culture which is **not entered** into NHSN because blood specimens only are being monitored. On January 2, while in the same location (ICU), the same patient has a positive MRSA blood culture which **is entered** into NHSN. This starts the 14 day count. On January 5, while in the same location (ICU), the same patient has another positive MRSA blood culture which is **not entered** into NHSN because it has not been 14 days since the original positive MRSA blood culture while in the same location. The January 5 positive blood culture starts a new 14 day count. On January 19, while in the same location (ICU), the same patient has another positive MRSA blood culture. The January 19 MRSA blood culture **is entered** into NHSN because it has been > 14 days since the patient's most recent positive blood culture (January 5) while in the **same** location (January 19 is day 15).



Date	Location	Specimen Body Site	Reportable?	
1-Jan	ICU	Urine – MRSA isolate	NO	
2-Jan	ICU	Blood – MRSA isolate	YES	
3-Jan	ICU			
4-Jan	ICU			
5-Jan	ICU	Blood – MRSA isolate	NO	1
6-Jan	ICU			2
7-Jan	ICU			3
8-Jan	ICU			4
9-Jan	ICU			5
10-Jan	ICU			6
11-Jan	ICU			7
12-Jan	ICU			8
13-Jan	ICU			9
14-Jan	ICU			10
15-Jan	ICU			11
16-Jan	ICU			12
17-Jan	ICU			13
18-Jan	ICU			14
19-Jan	ICU	Blood – MRSA isolate	YES	15

EXAMPLE: Monitoring *All Specimens* with multiple isolates from same location	On January 1, an ICU patient has positive MRSA urine culture which **is entered** into NHSN because it is the first MDRO isolate of the month for this patient. On January 2, while in the same location (ICU), the same patient has a positive MRSA blood culture which **is entered** into NHSN because it is the first positive MRSA blood isolate for the month. *No other **non-blood** MRSA isolates should be reported for the month for this patient and location as these would represent duplicate isolates.* Any additional MRSA positive blood isolates for the month should be reported following the same 14-day rule as when reporting *Blood Specimens only.* Subsequent months should be reported in the same manner. 

Laboratory-Identified (LabID) Event: All non-duplicate MDRO isolates from any specimen source and unique blood source MDRO isolates. [EXCLUDES tests related to active surveillance testing]. Even if reporting at the Facility Wide level (FacWideIN or FacWideOUT), all reporting must follow rules by location for reporting.

Note: A LabID Event calculator is available on the NHSN website to help with data entry decision making around the 14-day rule, which is location specific.

EXAMPLE #1: Monitoring *Blood Specimens only* with isolates from ED & inpatient location	If monitoring blood specimens for FacWideIN (which requires surveillance in the emergency department and 24-hour observation locations), a patient has a positive MRSA laboratory isolate while in the emergency department (ED). This specimen represents a MRSA LabID Event and should be entered for the outpatient emergency department. The next calendar day, the same patient is admitted to ICU and three days later, has a second positive MRSA blood specimen. This specimen also represents a unique LabID Event, because it is the first positive blood specimen in *this location* (ICU). **Note**: while this patient has two LabID Events, the second specimen taken from the ICU will be removed from most analysis reports.
EXAMPLE #2: Monitoring *All Specimens*	If monitoring *all specimens*, on January 2, a newly admitted ICU patient with no previous positive laboratory isolates during this admission has a positive MRSA urine culture. This specimen represents a LabID Event since it is the first MRSA isolate for the patient, the location, and the calendar month.
EXAMPLE #3: Monitoring *All Specimens* with isolates from ED & inpatient location	If monitoring *all specimens* for FacWideIN surveillance, on January 2, a VRE wound culture is collected from the facility's own ED. The patient is then admitted to 4W the next calendar day. The ED culture result must be entered as an outpatient LabID event for the ED location for January 2, as the ED location is included in FacWideIN surveillance and reporting.
EXAMPLE #4: Monitoring *Blood Specimens only* with multiple blood isolates	If monitoring *blood specimens only*, on January 26, a newly admitted ICU patient with no previous positive laboratory isolates during this admission has a positive MRSA urine culture which is not entered as a LabID Event since *blood specimens* only are being monitored. The following day, while in the same location, the same patient has a positive MRSA blood culture. This specimen represents a LabID Event since it is a unique blood source (the first MRSA **blood** isolate for the same patient and same location). While remaining in ICU, the same patient has another positive blood culture on February 5. This does **not** represent a new LabID Event since it has **not** been >14 days since the most recent MRSA positive blood isolate for this patient and location.

Reporting Instructions:

- All LabID Events must be reported by location
- LabID event reporting is separate and independent of events reported through MDRO Infection Surveillance reporting and/or HAIs reported through the Device-associated and/or Procedure-associated Modules.
- For instructions on unique reporting scenarios, see *Appendix 1. Guidance for Handling MDRO and CDI Module Infection Surveillance and LabID Event Reporting When Also Following Other NHSN Modules*
- For additional reporting information, see *Appendix 3. Differentiating Between LabID Event and Infection Surveillance*

Numerator Data: Data will be reported using the *Laboratory-identified MDRO or CDI Event* form (CDC 57.128).

Denominator Data: Patient days and admissions (for inpatient locations), and encounters (for outpatient locations) are reported using the *MDRO and CDI Monthly Denominator Form* (CDC 57.127).

Reporting FacWideIN Denominators:
Row 1: Facilities will enter total patient days and total patient admissions to reflect all inpatient locations physically located in the hospital.

Row 2: The second row of denominator data entry should reflect all inpatient locations minus inpatient rehabilitation units (IRF units) and inpatient psychiatric units (IPF units) with a separate CCN.

Row 3: The third row of denominator data entry should reflect all inpatient locations minus inpatient rehabilitation units (IRF units) and inpatient psychiatric units (IPF units) with a separate CCN minus baby-based locations (for example, NICU, well baby nursery, etc.). The totals should not include other facility types within the hospital that are enrolled and reporting separately (for example, LTAC). See Table of Instructions for completion instructions.

Note: For Acute Care Hospitals completing FacWideIN surveillance, additional guidance on denominator reporting is available here: https://www.cdc.gov/nhsn/pdfs/cms/acutecare-mrsa-cdi-labiddenominator-reporting.pdf

FacWideOUT, Emergency Departments, 24 hour observation units, and other outpatient units: monthly denominator data are reported as encounters. An encounter is defined as any patient visit to an outpatient location.

Note: For NHSN reporting purposes, the 'date admitted to the facility' is HD 1. When determining a patient's admission dates to both the facility and specific inpatient location, the NHSN user must take into account any days spent in an inpatient location as an "observation" patient before being officially admitted as an inpatient to the facility, as these days contribute to exposure risk. Therefore, all days spent in an inpatient unit, regardless of local admission status and/or billing status are included in the counts of admissions and inpatient days for the facility and specific location; **for NHSN reporting purposes, the date admitted to the facility is the calendar date that the patient physically locates to an inpatient location**. For further information on counting patient days and admissions, see *Appendix 2: Determining Patient Days for Summary Data Collection: Observation vs. Inpatients.*

Data Analysis: Based on data provided on the LabID Event form, each event will be categorized by NHSN to populate different measures. By classifying positive specimens obtained on day 1 (admission date), day 2, and day 3 of admission as community-onset (CO) LabID Events and positive specimens obtained on or after day 4 as healthcare facility-onset (HO) LabID Events, all HO LabID Events will have occurred more than 48 hours after admission.

The following categorizations and prevalence and incidence calculations are built into the analysis capabilities of NHSN, and are based on timing of admission to a facility and/or location, specimen collection, location where specimen was collected, and monthly denominators. Descriptions are provided to explain how the categories and metrics are defined in NHSN.

Note: For FacWideIN analysis reports, the denominator values entered on "Row 2" of the FacWideIN denominator form ares used for MDRO analyses.

Categorizing MDRO LabID Events

Note: See "Onset" variable in the NHSN Line List. This is based on the location of specimen collection, the date admitted to facility, and date specimen collected, as applicable

Community-Onset (CO): LabID Event specimen collected in an outpatient location or an inpatient location ≤3 days after admission to the facility (specifically, days 1, 2, or 3 of admission).

Healthcare Facility-Onset (HO): LabID Event specimen collected >3 days after admission to the facility (specifically, on or after day 4).

The following section describes the various measures calculated for MDRO LabID event surveillance.

Note: FacWideIN MDRO rate and SIR calculations utilize the FacWideIN denominators (patient days and admissions) reported for the facility minus admissions and patient days from inpatient rehabilitation facility (IRF) and inpatient psychiatric facility (IPF) locations with unique CCNs. For NHSN reporting purposes, IRF/IPFs located within an acute care hospital (ACH) are recognized as an inpatient location for the ACH; therefore, admissions/ discharges from ACH to IRF/IPF and vice versa are considered 'transfers', specifically, the hospitalization is considered a 'continuous' stay for event reporting.

Proxy Measures for Exposure Burden of MDROs – *All specimens*:

Inpatient Reporting:

- Admission Prevalence Rate = Number of 1st LabID Events per patient per month identified ≤3 days after admission to the location (if monitoring by inpatient location), or the facility (if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

- Location Percent Admission Prevalence that is Community-Onset = Number of Admission Prevalent LabID Events to a location that are CO / Total number Admission Prevalent LabID Events x 100

- Location Percent Admission Prevalence that is Healthcare Facility-Onset = Number of Admission Prevalent LabID Events to a location that are HO / Total number of Admission Prevalent LabID Events x 100

- Overall Patient Prevalence Rate = Number of 1st LabID Events per patient per month regardless of time spent in location (specifically prevalent + incident, if monitoring by inpatient location), or facility (specifically, CO + HO, if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

Outpatient Reporting:

- Outpatient Prevalence Rate = Number of 1st LabID Events per patient per month for the location (if monitoring by outpatient location), or the facility (if monitoring by overall facility-wide outpatient = FacWideOUT) / Number of patient encounters for the location or facility x 100

Measures for MDRO Bloodstream Infection: Calculated when monitoring either *all specimens* or *blood specimens* only. **Note:** except for certain locations (specifically inpatient

rehabilitation facilities, emergency department, and 24-hour observation locations), the Blood specimens only option can only be used at the FacWideIN and FacWideOUT levels.

MRSA Bloodstream Infection Standardized Infection Ratio (SIR):
The SIR is calculated by dividing the number of observed events by the number of predicted events. The number of predicted events is calculated using LabID probabilities estimated from negative binomial models constructed from 2015 NHSN data, which represents a standard population. For most settings, MRSA Bloodstream Infection SIRs are calculated for FacWideIN surveillance only.

Note: In the NHSN application, the number of predicted events is referred to as "numPred". The SIR will be calculated only if the number of predicted events (numPred) is ≥1 to help enforce a minimum precision criterion.

Inpatient Reporting:

- MRSA Bloodstream Infection SIR = Number of all unique blood source MRSA LabID Events identified in a non-IRF/IPF inpatient location >3 days after admission to the facility (specifically, HO MRSA blood events with no prior MRSA blood event for that patient in the previous 14 days) / Number of predicted HO MRSA blood LabID Events
    - Note: This SIR is only available for FacWideIN reporting. More information about which events are counted in the FacWideIN SIR can be found here: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/mrsacdi_tips.pdf

- MDRO Bloodstream Infection Admission Prevalence Rate = Number of all unique blood source LabID Events per patient per month identified ≤3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall FacWideIN) / Number of patient admissions to the location or facility x 100
    - Note: For MRSA Bacteremia FacWideIN surveillance, this is the CO rate that is used in the risk adjustment calculations of the MRSA bacteremia SIR. The numerator excludes any event in which the patient had a prior positive event in the previous 14 days.

- MDRO Bloodstream Infection Incidence Rate = Number of all unique blood source LabID Events per patient per month identified >3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

- MDRO Bloodstream Infection Incidence Density Rate = Number of all unique blood source LabID Events per patient per month identified >3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall

facility-wide inpatient=FacWideIN) / Number of patient days for the location or facility x 1,000

- MDRO Bloodstream Infection Overall Patient Prevalence Rate = Number of 1st Blood LabID Events per patient per month regardless of time spent in location (specifically, prevalent + incident, if monitoring by inpatient location), or facility (specifically, CO + HO, if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

MRSA Bloodstream Reporting for CMS-certified Inpatient Rehabilitation Facilities (IRFs) mapped as units within a hospital:

Two analytic reports and metrics are available for analyzing MRSA bacteremia LabID event data reported from IRF units located within a hospital:

- MRSA Bloodstream Infection SIR for IRF units = Number of all unique blood source MRSA LabID Events identified >3 days after location admission to the IRF unit and where the patient had no positive MRSA bacteremia LabID Event in the prior 14 days in any CMS-certified IRF unit / Number of predicted HO MRSA blood LabID Events in the IRF unit

- Inpatient MRSA Bacteremia Incidence Density Rate for IRF units: Number of all incident blood source MRSA LabID events identified > 3 days after location admission to an IRF unit and where the patient had no positive MRSA bacteremia LabID Events in the prior 14 days in any CMS-certified IRF unit / Total number of patient days for IRF unit(s) x 1,000

Outpatient Reporting:

- Combined MRSA Bloodstream Infection Outpatient Prevalence Rate for ED and 24 hour Observation Locations = Number of unique blood source MRSA LabID events identified in an ED or 24 hour observation location / Total patient encounters in ED and 24 hour observation location(s) x 100
    - Note: For MRSA Bacteremia FacWideIN surveillance, this outpatient rate is used in the risk adjustment calculations of the MRSA bacteremia SIR. The numerator excludes any event in which the patient had a prior positive event in the previous 14 days in an ED or 24-hour observation location.

- MDRO Bloodstream Infection Outpatient Prevalence Rate = Number of all unique blood source LabID Events per patient per month for the location (if monitoring by outpatient location), or the facility (if monitoring by overall facility-wide outpatient=FacWideOUT) / Number of patient encounters for the location or facility x 100

Measures for MDRO-CRE surveillance: The above incidence and prevalence rates are calculated separately for each species of CRE (specifically, *Klebsiella, E.coli,* and *Enterobacter)* as well as for all species combined. The following additional metric is available for CRE LabID event reporting:

Percent Positive for Carbapenemase: number CRE positive for carbapenemase / number CRE tested for carbapenemase x 100

Proxy Measures for MDRO Healthcare Acquisition:

- Overall MDRO Infection/Colonization Incidence Rate = Number of 1st LabID Events per patient per month among those with no documented prior evidence of previous infection or colonization with this specific organism type from a previously reported LabID Event, and identified >3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

- Overall MDRO Infection/Colonization Incidence Density Rate = Number of 1st LabID Events per patient per month among those with no documented prior evidence of previous infection or colonization with this specific organism type from a previously reported LabID Event, and identified >3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient days for the location or facility x 1,000

Clostridioides difficile (C. difficile) LabID Event Reporting

Methodology: Facilities may choose to monitor *C. difficile* where *C. difficile* testing in the laboratory is performed routinely only on unformed (specifically, conforming to the shape of the container) stool samples. *C. difficile* LabID events may be monitored from all available inpatient locations, emergency departments and 24 hour observation locations as well as all available affiliated outpatient locations where care is provided to patients post discharge or prior to admission (for example, outpatient clinics and/or physician offices using the same medical record number for the patient as the admitting facility).

Settings: *C. difficile* LabID Event reporting can occur in any location: inpatient or outpatient. Surveillance will NOT be performed in NICU, SCN, babies in LDRP, well-baby nurseries, or well-baby clinics. If LDRP locations are being monitored, baby counts must be removed.

Requirements: All C. *difficile* test results are evaluated using the algorithm in Figure 3. Facilities must choose one or more of the reporting choices listed in Table 3 below and report data accordingly.

Figure 3. *C. difficile* Test Result Algorithm for Laboratory Identified (LabID) Events

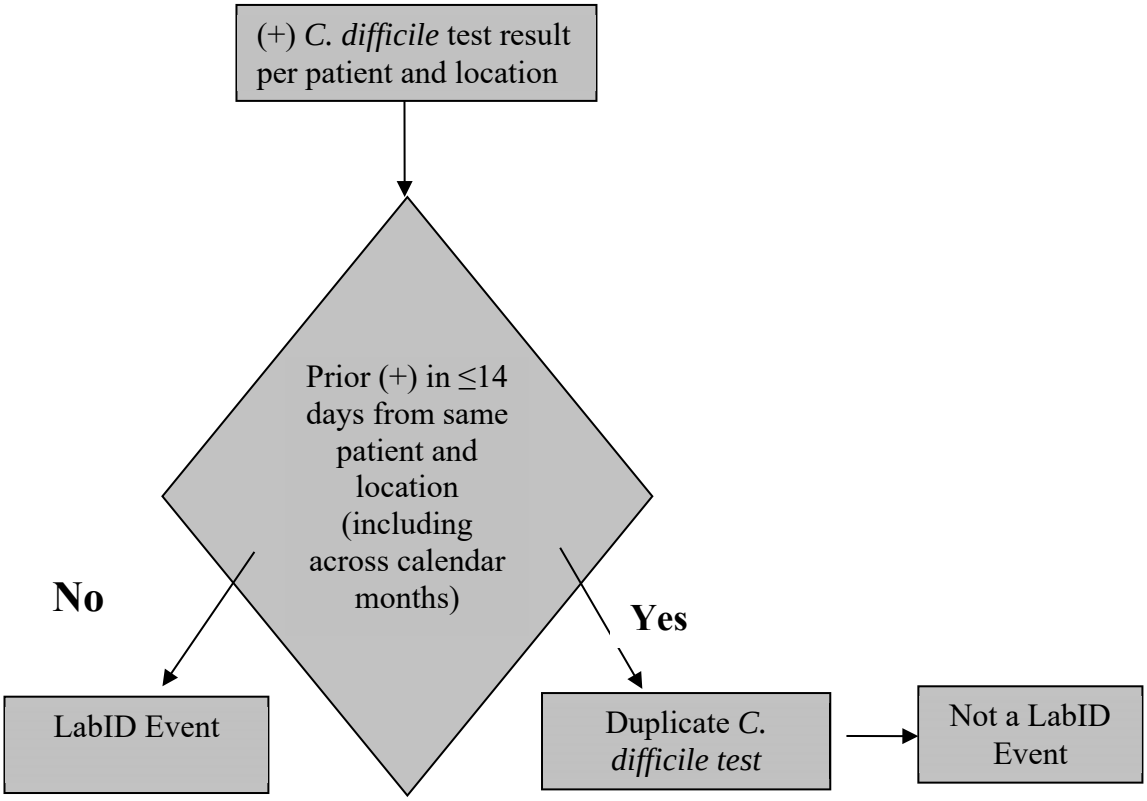


Table 3: Reporting Options for *C. difficile* LabID Event

Method	Numerator Data Reporting by Location	Denominator Data Reporting
Facility-wide by location	Enter each CDiff LabID Event reported by location	Report separate denominators for **each location** in the facility as specified in the NHSN Monthly Reporting Plan
Selected locations	Enter each CDiff LabID Event reported by selected locations	Report separate denominators for **selected locations** monitored as specified in the NHSN Monthly Reporting Plan
Overall Facility-wide Inpatient (FacWideIN)	Enter each CDiff LabID Event from all inpatient locations AND separately for outpatient emergency department and 24-hour observation location(s)	Report total denominator data for **all inpatient locations** physically located in the hospital (for example, total number of admissions and total number of patient days), **minus** inpatient rehabilitation facility and inpatient psychiatric facility locations with unique CCNs • Separate denominators should be entered to capture encounters for each mapped outpatient emergency department and 24-hour observation location(s)
Overall Facility-wide Outpatient (FacWideOUT)	Enter each CDiff LabID Event from all affiliated outpatient locations separately	Report total denominator data for **all outpatient locations** (for example, total number of encounters including ED and OBS encounters in addition to other outpatient locations)

Note: Facilities must indicate each reporting choice chosen for the calendar month on the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions:

CD-positive laboratory assay:
A positive laboratory test result for *C. difficile* toxin A and/or B, (includes molecular assays [PCR] and/or toxin assays) tested on an unformed stool specimen (must conform to the container)
OR
A toxin-producing *C. difficile* organism detected by culture or other laboratory means performed on an unformed stool sample (must conform to the container).

Note:

- When using a multi-step testing algorithm for CDI on the same unformed stool specimen, the finding of the last test performed on the specimen that is documented in the patient medical record will determine if the CDI positive laboratory assay definition is met.

Examples of Multi-step Testing Interpretations (does not consider prior positives):

Multi-step Testing Same Specimen	Testing Step	Testing Method	Documented Findings	Eligible LabID Event?
Example A	Test 1	NAAT	Negative	**Yes**
	Test 2	GDH	Positive	
Last test →	Test 3	EIA	**Positive**	
Example B	Test 1	NAAT	Positive	No
	Test 2	GDH	Positive	
Last test →	Test 3	EIA	Negative	
Example C	Test 1	GDH	Positive	**Yes**
	Test 2	EIA	Negative	
Last test →	Test 3	NAAT	**Positive**	
Example D	Test 1	GDH	Positive	No
	Test 2	EIA	Positive	
Last test →	Test 3	NAAT	Negative	

Duplicate C. *difficile*-positive test:

- Any *C. difficile* toxin-positive laboratory result from the same patient and location, following a previous *C. difficile* toxin-positive laboratory result within 14 days even across calendar months and readmissions to the same facility location.
- There should be 14 days with no *C. difficile* toxin-positive laboratory result for the patient and specific location before another *C. difficile* LabID Event is entered into NHSN for the patient and location.
- The date of specimen collection is considered Day 1.

Note: NHSN recommends each facility keep an internal line listing log of all positive specimens as a reference in LabID event reporting to ensure the 14-day rule is applied correctly. The 14-day rule for LabID events reporting is specific to the location and resets each time a patient transfers to a new inpatient location.

EXAMPLE: On January 1, an ICU patient has a *C. difficile* toxin-positive laboratory result which **is** entered into NHSN. On January 4, while in the same location (ICU), the same patient has another positive *C. difficile* toxin-positive laboratory result which is **not** entered into NHSN because it is a duplicate for the patient and location (has not been >14 days since the original *C. difficile* toxin-positive laboratory result while in the same location). On January 16, while in the same location (ICU), the same patient has another *C. difficile* toxin-positive laboratory result.

While it has been more than 14 days since the initial positive *C. difficile* toxin-positive laboratory result was entered into NHSN (January 1) for the same patient and same location, it has not been >14 days since the patient's most recent *C. difficile* toxin-positive laboratory result (January 4) **while in the same location**. Therefore, the *C. difficile* toxin-positive laboratory result for January 16 is **not** entered into NHSN. On January 31, the patient has another *C. difficile* toxin-positive laboratory result while in the same location (ICU). Since it has been >14 days since the patient's most recent *C. difficile* toxin-positive laboratory result (January 16) while in the same location, this event **is** entered into NHSN.

Laboratory-Identified (LabID) Event*:* All non-duplicate *C. difficile* toxin-positive laboratory results. Even if reporting at the facility-wide level (FacWideIN or FacWideOUT), all reporting must follow rules by location for reporting.

Notes:

- A LabID Event calculator is available on the NHSN website to help with data entry decision making around the location specific 14-day rule.
- If a facility is participating in FacWideIN surveillance and reporting, the facility must also conduct separate location-specific surveillance in all outpatient emergency department and 24-hour observation locations. This means LabID Events for the same organism and LabID Event type must be reported from these locations even if the patient is not subsequently admitted to an inpatient location during the same encounter.
- All emergency department and 24-hour observation locations must be identified and mapped as outpatient locations within NHSN. For more information about mapping locations, see Chapter 15 in the NHSN manual.

Reporting Instructions: All *C. difficile* LabID Events must be reported by location and separately and independently of Events reported using the *C. difficile* Infection Surveillance reporting option and/or HAI reporting.

Numerator: Data will be reported using the *Laboratory-Identified MDRO or CDI Event* form (CDC 57.128).

Denominator Data: Patient days and admissions (for inpatient locations), and encounters (for outpatient locations) are reported using the MDRO and CDI Monthly Denominator Form (CDC 57.127).

Reporting FacWideIN Denominators:
Row 1: Facilities will enter total patient days and total patient admissions to reflect all inpatient locations physically located in the hospital.

Row 2: The second row of denominator data entry should reflect all inpatient locations minus inpatient rehabilitation units (IRF units) and inpatient psychiatric units (IPF units) with a separate CCN.

Row 3: The third row of denominator data entry should reflect all inpatient locations minus inpatient rehabilitation units (IRF units) and inpatient psychiatric units (IPF units) with a separate CCN minus baby-based locations (for example, NICU, well baby nursery, etc.). The totals should not include other facility types within the hospital that are enrolled and reporting separately (for example, LTAC). See Table of Instructions for completion instructions.

Note: For Acute Care Hospitals completing FacWideIN surveillance, additional guidance on denominator reporting is available here: https://www.cdc.gov/nhsn/pdfs/cms/acutecare-mrsa-cdi-labiddenominator-reporting.pdf

FacWideOUT and ED/24-hour Observation locations reporting: Denominator data is provided using encounters. An encounter is defined as a patient visit to an outpatient location for care.

When determining a patient's admission dates to both the facility and specific inpatient location, the NHSN user must take into account all days, including any days spent in an inpatient location as an "observation" patient before being officially admitted as an inpatient to the facility, as these days contribute to exposure risk. Therefore, all days spent in an inpatient unit, regardless of admission and/or billing status are included in the counts of admissions and inpatient days for the facility and specific location. For NHSN reporting purposes, the facility and specific location admission date is the first day spent in the inpatient location. For further information on counting patient days and admissions, see *Appendix 2: Determining Patient Days for Summary Data Collection: Observation vs. Inpatients*

C. Difficile Data Analysis:

The following categorizations and prevalence and incidence calculations are built into the analysis capabilities of NHSN, and are based on timing of admission to a facility and/or location, specimen collection date, location where specimen was collected, and monthly denominators. Descriptions are provided to explain how the categories and metrics are defined in NHSN.
Note: For FacWideIN analysis reports, the denominator values entered on "Row 3" of the FacWideIN denominator form as used for CDI analyses.

CDI Event Categorization
Note: This is based on current date of specimen collection and prior date of specimen collection of a previous CDI LabID Event. Refer to the "cdiAssay" variable in NHSN Line List.

- Incident CDI LabID Event: Any CDI LabID Event from a specimen obtained > 56 days after the most recent CDI LabID Event (or with no previous CDI LabID Event documented) for that patient. Note: the date of first specimen collection is considered day 1.

- Recurrent CDI LabID Event: Any CDI LabID Event from a specimen obtained > 14 days and ≤ 56 days after the most recent CDI LabID Event for that patient. Note:the date of first specimen collection is considered day 1.

- CdiAssay will be unassigned, or "blank", for any CDI LabID event that was collected ≤ 14 days after the most recent CDI LabID event for that patient.

Note: Beginning in 2015, for FacWideIN surveillance, cdiAssay is assigned based on Events from inpatient locations, emergency departments, and 24-hour observation locations. For data reported prior to 2015, cdiAssay was assigned based on events from within the same setting only. For example, in 2014, if performing both FacWideIN and FacWideOUT surveillance, cdiAssay of inpatient CDI LabID Events was determined by a review of previously-entered CDI LabID Events from inpatient locations only.

In addition to the cdiAssay categorization, CDI LabID Events are further categorized within NHSN using the 'onset' variable. The following categorizations, as well as prevalence and incidence calculations that are built into the analysis capabilities of NHSN, are based on timing of admission to facility and/or location, specimen collection date, location where specimen was collected, and previous discharge. Descriptions are provided to explain how the categories and metrics are defined in NHSN.

Note: See "Onset" variable in NHSN Line List.

- Community-Onset (CO): LabID Event meeting one of the following criteria:
  - A) collected in an outpatient location in which the patient was not previously discharged from an inpatient location within the same facility ≤ 28 days prior to current date of specimen collection
  - B) collected in an inpatient location ≤3 days after admission to the facility (specifically, days 1, 2, or 3 of admission).

- Community-Onset Healthcare Facility-Associated (CO-HCFA): CO LabID Event collected from an inpatient or an outpatient location from a patient who was discharged from the facility ≤ 28 days prior to current date of stool specimen collection. The previous discharge must have been from an inpatient location within the same facility (in other words, an outpatient visit does not qualify as "admitted", and therefore is not used to set the timeline for CO-HCFA).

- Healthcare Facility-Onset (HO): LabID Event collected from an inpatient location >3 days after admission to the facility (specifically, on or after day 4).

The following section describes the various measures calculated for CDI LabID event surveillance.

Note: Beginning with 2015 data, the number of FacWideIN admissions and number of FacWideIN patient days used in the various CDI rate and SIR calculations will represent those reported for the facility minus admissions and patient days from the following: IRF and IPF locations with unique CCNs separate from the reporting facility, neonatal ICUs, special care nurseries, and well-baby locations. The CDI rate and SIR calculations use the denominators entered on Row 3 of the FacWideIN denominator form.

Measures of CDI Prevalence:

- Inpatient Admission Prevalence Rate = Number of non-duplicate CDI LabID Events per patient per month identified ≤3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall facility-wide inpatient=FacWideIN) (includes CO and CO-HCFA events) / Number of patient admissions to the location or facility x 100
  - Note: See "CDIF_admPrevRate" in the NHSN Rate Tables.

- Community-Onset Admission Prevalence Rate = Number of inpatient CDI LabID events that are CO, per month, in the facility / Number of patient admissions to the facility x 100

  Note: See "CDI_COprevRate" in the NHSN Rate Tables. This calculation is only accurate for overall FacWideIN reporting. For CDI FacWideIN

surveillance, this is the CO rate that is used in the risk adjustment calculations of the CDI SIR.

- Inpatient Percent Admission Prevalence that is Community-Onset = Number of Admission Prevalent LabID Events to a location that are CO / Total number Admission Prevalent LabID Events x 100
  - Note: See "CDIF_pctAdmPrevCO" in the NHSN Rate Tables. This percentage is available for unit-specific CDI surveillance and is calculated separately for each applicable unit. The numerator in this formula does not include CDI LabID events labeled as CO-HCFA.

- Inpatient Percent Admission Prevalence that is Community-Onset Healthcare Facility-Associated = Number of Admission Prevalent LabID Events to a location that are CO-HCFA / Total number Admission Prevalent LabID Events x 10
  - Note: See "CDIF_pctAdmPrevCOHCFA". This percentage is available for unit-specific CDI surveillance and is calculated separately for each applicable unit.

- Inpatient Percent Admission Prevalence that is Healthcare Facility-Onset = Number of Admission Prevalent LabID Events to a location that are HO / Total number of Admission Prevalent LabID Events x 100
  - Note: See "CDIF_pctAdmPrevHO" in the NHSN Rate Tables. This percentage is available for unit-specific CDI surveillance and is calculated separately for each applicable unit.

- Inpatient Overall Patient Prevalence Rate = Number of 1st CDI LabID Events per patient per month regardless of time spent in location (specifically, prevalent + incident, if monitoring by inpatient location), or facility (specifically, CO + CO-HCFA + HO, if monitoring by FacWideIN) / Number of patient admissions to the location or facility x 100
  - Note: See "CDIF_prevRate" in the NHSN Rate Tables.

- Outpatient Prevalence Rate = Number of all non-duplicate CDI LabID Events per patient per month for the location (if monitoring by outpatient location), or the facility (if monitoring by overall facility-wide outpatient=FacWideOUT) / Number of patient encounters for the location or facility x 100

Measures of CDI Incidence:

- CDI Standardized Infection Ratio (SIR):

The SIR is calculated by dividing the number of observed events by the number of predicted events. The number of predicted events is calculated using LabID probabilities estimated from

negative binomial models constructed from 2015 NHSN data, which represents a standard population. For most settings, CDI SIRs are calculated for FacWideIN surveillance only.

Note: In the NHSN application, the number of predicted events is referred to as "numPred". The SIR will be calculated only if the number of predicted events (numPred) is ≥1, to help enforce a minimum precision criterion. The CDI SIRs are only calculated at the quarter level or higher in order to account for the quarterly-reporting of CDI test type. Note that SIRs will not be calculated for a quarter until the CDI test type has been reported. When the FacWideIN MDRO denominator form is completed for the last month of each quarter, users are asked to report the primary type of test that was used to identify CDI in the hospital for that quarter. That test type is then used in the calculation of the FacWideIN CDI SIR for that quarter. The test type selected should reflect the testing methodology used for clinical decision making.

- Facility CDI Incidence SIR = Number of all Incident CDI LabID Events identified in a non-IRF/IPF location >3 days after admission to the facility (specifically, HO events with no prior positive events for that patient in the previous 14 days) / Number of predicted Incident HO CDI LabID Events
    - Note: This SIR is only available for FacWideIN reporting. More information about which events are counted in the FacWideIN CDI SIR can be found here: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/mrsacdi_tips.pdf

- Inpatient Location CDI Incidence Rate = Number of Incident CDI LabID Events per month identified >3 days after admission to the location / Number of patient days for the location x 10,000
    - Note: See "CDIF_incRate" in the NHSN Rate Tables. This rate is only available for location-specific CDI surveillance.

- Inpatient Facility CDI Healthcare Facility-Onset Incidence Rate = Number of all Incident HO CDI LabID Events per month in the facility / Number of patient days for the facility x 10,000
    - Note: See "CDIF_HOIncRate" in the NHSN Rate Tables. (This calculation is only available for FacWideIN reporting.)

- Inpatient Facility CDI Combined Incidence Rate = Number of all Incident HO and CO-HCFA CDI LabID Events per month in the facility / Number of patient days for the facility x 10,000
    - Note: See "CDIF_facIncRate" in the NHSN Rate Tables. (This calculation is only available for FacWideIN reporting.)

C. difficile Reporting for CMS-certified Inpatient Rehabilitation Facilities (IRFs) mapped as units within a hospital:

IRF units within a hospital that participate in the CMS Inpatient Rehabilitation Facility Quality Reporting Program will be given a CDI SIR separate from the FacWideIN SIR for the acute care hospital. The SIR will be sent to CMS on behalf of IRF units participating in the CMS IRF Quality Reporting Program. In addition, a CDI LabID Event incidence rate is available for IRF units.

- Inpatient CDI SIR for IRF units: Number of all incident CDI LabID events identified > 3 days after location admission to an IRF unit and where the patient had no positive CDI LabID events in the prior 14 days in any CMS-certified IRF unit / Number of predicted incident CDI LabID events in the IRF unit(s)
    - Note: This SIR is only available for CMS-certified IRF units located within an acute care or critical access hospital. The CDI SIR for IRF Units is only calculated at the quarter level or higher in order to account for the quarterly-reporting of CDI test type. Note that SIRs will not be calculated for a quarter until the CDI test type has been reported. When the IRF Unit's MDRO denominator form is completed for the last month of each quarter, users are asked to report the primary type of test that was used to identify CDI for that quarter. That test type is then used in the calculation of the IRF Unit's CDI SIR for that quarter. More information about which events are counted in the IRF Unit's CDI SIR can be found here: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/mrsacdi_tips.pdf

- Inpatient CDI Incidence Density Rate for IRF units: Number of all incident CDI LabID events identified > 3 days after location admission to an IRF unit and where the patient had no positive CDI LabID events in the prior 14 days in any CMS-certified IRF unit / Total number of patient days for IRF units x 10,000
    - Note: See "CDIF_IRFIncRate" in the NHSN Rate Tables. This rate is only available for CMS-certified IRF units located within an acute care or critical access hospital

Table 4. Measures Delivered to CMS For Facilities Participating in Quality Reporting Programs: MRSA Bloodstream Infection and *C. difficile* LabID Events

Facility Type	**CMS Quality Reporting Program**	**MRSA Bloodstream Infection LabID Event Measure Sent to CMS**	***C. difficile* LabID Event Measure Sent to CMS**
General Acute Care Hospitals	Inpatient Quality Reporting Program	MRSA Bloodstream Infection SIR (FacWideIN)	CDI Incidence SIR (FacWideIN)
Long Term Care Hospitals (referred to as Long Term Acute Care Hospitals in NHSN)	Long Term Care Hospital Quality Reporting Program	NONE*	CDI Incidence SIR (FacWideIN)
Inpatient Rehabilitation Facilities (IRFs)	Inpatient Rehabilitation Facility Quality Reporting Program	**IRF units within a hospital**: NONE*	**IRF units within a hospita**l: CDI Incidence SIR for IRF Units
		Free-standing IRFs: NONE*	**Free-standing IRFs**: CDI Incidence SIR (FacWideIN)

*****Starting with 2018 Q4 data, CMS removed the requirement for IRFs and LTACs to report MRSA bacteremia LabID Events as part of the CMS Quality Reporting Program. However, MRSA bacteremia LabID Event analysis reports, including the SIR, are still available to all facilities.

Option 2: Infection Surveillance Reporting

Introduction: The Infection Surveillance reporting option for MDRO and *C. difficile* infections enables users to utilize the CDC/NHSN healthcare-associated infections definitions for identifying and reporting infections associated with MDROs and/or *C. difficile*. Surveillance must occur from at least one patient care area and requires active, patient-based, prospective surveillance of the chosen MDRO(s) and/or *C. difficile* infections (CDIs) by a trained Infection Preventionist (IP). This means that the IP shall seek to confirm and classify infections caused by the chosen MDRO(s) and/or *C. difficile* for monitoring during a patient's stay in at least one patient care location during the surveillance period. These data will enhance the ability of NHSN to aggregate national data on MDROs and CDIs.

A. MDRO Infection Surveillance Reporting

Methodology: Facilities may choose to monitor one or more of the following MDROs: MRSA, MRSA and MSSA, VRE, CephR- *Klebsiella*, CRE (CRE-*Klebsiella,* CRE-*E. coli*, **and** CRE-*Enterobacter)*, and multidrug-resistant *Acinetobacter* spp. (See definitions in Section I, Option 1A). For S. *aureus*, both the resistant (MRSA) and the susceptible (MSSA) phenotypes can be tracked to provide concurrent measures of the susceptible pathogens as a comparison to those of the resistant pathogens in a setting of active MRSA prevention efforts. **Note:** No Active Surveillance Culture/Testing (ASC/AST) results are to be included in this reporting of individual results.

Settings: Infection Surveillance can occur in any inpatient location where such infections may be identified and where denominator data can be collected, which may include critical/intensive care units (ICU), specialty care areas (SCA), neonatal units, step-down units, wards, and chronic care units. In Labor, Delivery, Recovery, & Post-partum (LDRP) locations, where mom and babies are housed together, users must count both mom and baby in the denominator. If moms only are being counted, then multiply moms times two to include both mom and baby in denominators.

Requirements: Surveillance for all types of NHSN-defined healthcare-associated infections (HAIs), regardless if HAI is included in "in-plan" or "off- plan" surveillance, of the MDRO selected for monitoring in at least one location in the healthcare facility as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions: MDROs included in this module are defined in Section I, Option 1A. Refer to *CDC/NHSN Surveillance Definitions for Specific Types of Infections* for infection site criteria.

Location of Attribution and Transfer Rule applies – See Identifying HAIs in NHSN chapter (Chapter 2).

Reporting Instructions: If participating in MDRO/CDI Infection Surveillance and/or LabID Event Reporting, along with the reporting of HAIs through the Device-Associated and/or Procedure-Associated Modules, see *Appendix 1: Guidance for Handling MDRO/CDI Module Infection Surveillance and LabID Event Reporting When Also Following Other NHSN Modules*, for instructions on unique reporting scenarios.

Numerator Data: Number of healthcare-associated infections, by MDRO type. Infections are reported on the appropriate NHSN forms: *Primary Bloodstream Infection, Pneumonia, Ventilator-Associated Event, Urinary Tract Infection, Surgical Site Infection, or MDRO or CDI Infection Event (CDC 57.108, 57.111, 57.112, 57.114, 57.120, and 57.126, respectively.).* See the *Table of Instructions,* located in each of the applicable chapters, for completion instructions.

Denominator Data: Number of patient days and admissions. Patient days and admissions are reported by location using the *MDRO and CDI Monthly Denominator Form* (CDC 57.127). See *Table of Instructions* for completion instructions.

Data Analysis: Data are stratified by time (for example, month, quarter, etc.) and patient care location. *MDRO Infection Incidence Rate* = Number of HAIs by MDRO type / Number of patient days x 1000

B. *Clostridium difficile* Infection Surveillance Reporting

Methodology: *C. difficile* Infection (CDI) Surveillance, reporting on all NHSN-defined healthcare-associated CDIs from at least one patient care area, is one reporting option for *C. difficile* (part of your facility's Monthly Reporting Plan). These data will enhance the ability of NHSN to aggregate national data on CDIs.

Settings: Infection Surveillance will occur in any inpatient location where denominator data can be collected, which may include critical/intensive care units (ICU), specialty care areas (SCA), step-down units, wards, and chronic care units. Surveillance will NOT be performed in Neonatal Intensive Care Units (NICU), Specialty Care Nurseries (SCN), babies in LDRP, or well-baby nurseries. If LDRP locations are being monitored, baby counts must be removed.

Requirements: Surveillance for CDI must be performed in at least one location in the healthcare institution as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions: Report all healthcare-associated infections where *C. difficile*, identified by a positive toxin result including toxin producing gene [PCR]), is the associated pathogen, according to the Repeat Infection Timeframe (RIT) rule for HAIs (See Identifying HAIs in NHSN chapter). Refer to specific definitions in *CDC/NHSN Surveillance Definitions for Specific Types of Infections* chapter for *C. difficile* gastrointestinal system infection (GI-CDI).

HAI cases of CDI that meet criteria for a healthcare-associated infection should be reported as *Clostridioides difficile* gastrointestinal system infection (GI-CDI). Report the pathogen as C. *difficile* on the *MDRO or CDI Infection Event* form (CDC 57.126). If the patient develops GI-CDI, and GI-GE or GI-GIT, report the GI-CDI and the GI-GE or GI-GIT only if additional enteric organisms are identified and applicable criteria are met. **Note:** CDI laboratory-identified event (LabID Event) categorizations (for example, recurrent CDI assay, incident CDI assay, healthcare facility-onset, community-onset, community-

onset healthcare facility-associated) do **not** apply to HAIs including *C. difficile* associated gastrointestinal system infections (GI-CDI). Each new GI-CDI must be reported according to the HAI rules outlined in *Identifying HAIs in NHSN* chapter.

CDI Complications: CDI in a case patient within 30 days after CDI symptom onset with at least one of the following:

1. Admission to an intensive care unit for complications associated with CDI (for example: for shock that requires vasopressor therapy);
2. Surgery (for example, colectomy) for toxic megacolon, perforation, or refractory colitis
   AND/OR
3. Death caused by CDI within 30 days after symptom onset and occurring during the hospital admission.

Location of Attribution and Transfer Rule apply to Infection Surveillance – See *Identifying HAIs in NHSN* chapter.

Numerator Data: Number of healthcare-associated *C. difficile* infections. Infections are reported on the *MDRO or CDI Infection Event* form (CDC 57.126). See *Tables of Instructions* for completion instructions.

Denominator Data: Number of patient days and admissions by location are reported using the *MDRO and CDI Monthly Denominator Form* (CDC 57.127). See *Tables of Instructions* for completion instructions.

C. difficile Infections:

Numerator: The total number of HAI CDI cases identified during the surveillance month for a location.

Denominator: The total number of patient days and admissions during the surveillance month for a location.

Data Analysis: Data are stratified by time (for example, month, quarter, etc.) and by patient care location.

C. *difficile* Infection Incidence Rate = Number of HAI CDI cases / Number of patient days x **10,000**

II. Supplemental Reporting

1. Prevention Process Measures Surveillance

a. Monitoring Adherence to Hand Hygiene

Introduction: This option will allow facilities to monitor adherence to hand hygiene after a healthcare worker (HCW) has contact with a patient or inanimate objects in the immediate vicinity of the patient. Research studies have reported data suggesting that improved after-contact hand hygiene is associated with reduced MDRO transmission. While there are multiple opportunities for hand hygiene during patient care, for the purpose of this option, only hand hygiene after contact with a patient or inanimate objects in the immediate vicinity of the patient will be observed and reported. (http://www.cdc.gov/handhygiene/)

Settings: Surveillance will occur in any location: inpatient or outpatient.

Requirements: Surveillance for adherence to hand hygiene in at least one location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). This should be done in patient care locations also selected for Infection Surveillance or LabID Event reporting.

In participating patient care locations, perform at least 30 different unannounced observations after contact with patients for as many individual HCWs as possible. For example, try to observe all types of HCWs performing a variety of patient care tasks during the course of the month, not only nurses, or not only during catheter or wound care. No personal identifiers will be collected or reported.

Definitions:

Antiseptic handwash: Washing hands with water and soap or other detergents containing an antiseptic agent.

Antiseptic hand-rub: Applying an antiseptic hand-rub product to all surfaces of the hands to reduce the number of microorganisms present.

Hand hygiene: A general term that applies to either: handwashing, antiseptic hand wash, antiseptic hand rub, or surgical hand antisepsis.

Handwashing: Washing hands with plain (specifically, non-antimicrobial) soap and water.

Numerator: Hand Hygiene Performed = Total number of observed contacts during which a HCW touched either the patient or inanimate objects in the immediate vicinity of the patient and appropriate hand hygiene was performed.

Denominator: Hand Hygiene Indicated = Total number of observed contacts during which a HCW touched either the patient or inanimate objects in the immediate vicinity of the patient and therefore, appropriate hand hygiene was indicated.
Hand hygiene process measure data are reported using the *MDRO and CDI Monthly Denominator Form* (CDC 57. 127). See Tables of Instructions for completion instructions.

Data Analysis: Data are stratified by time (for example, month, quarter, etc.) and patient care location.

Hand Hygiene Percent Adherence = Number of contacts for which hand hygiene was performed / Number of contacts for which hand hygiene was indicated x 100

b. Monitoring Adherence to Gown and Gloves Use as Part of Contact Precautions

Introduction: This option will allow facilities to monitor adherence to gown and gloves use when a HCW has contact with a patient or inanimate objects in the immediate vicinity of the patient, when that patient is on Transmission-based Contact Precautions. While numerous aspects of adherence to Contact Precautions could be monitored, this surveillance option is only focused on the use of gown and gloves. (http://www.cdc.gov/ncidod/dhqp/gl_isolation_contact.html)

Settings: Surveillance can occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care areas, (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (for example, surgical wards).

Requirements: Surveillance for adherence to gown and gloves use in at least one location in the healthcare institution for at least 1 calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Ideally, this should be done in patient care locations also selected for Infection Surveillance or LabID Event reporting.

Among patients on Transmission-based Contact Precautions in participating patient care locations, perform at least 30 unannounced observations. A total of thirty different contacts must be observed monthly among HCWs of varied occupation types. For example, try to observe all types of HCWs performing a variety of patient care tasks during the course of the month, not only nurses, or not only during catheter or wound care. Both gown and gloves must be donned appropriately prior to contact for compliance. No personal identifiers will be collected or reported.

Definitions:

Gown and gloves use**:** In the context of Transmission-based Contact Precautions, the donning of both a gown and gloves prior to contact with a patient or inanimate objects in the immediate vicinity of the patient. Both a gown and gloves must be donned appropriately prior to contact for compliance.

Numerator: Gown and Gloves Used = Total number of observed contacts between a HCW and a patient or

inanimate objects in the immediate vicinity of a patient on Transmission-based Contact Precautions for which gown and gloves had been donned appropriately prior to the contact.

Denominator: Gown and Gloves Indicated = Total number of observed contacts between a HCW and a patient on Transmission-based Contact Precautions or inanimate objects in the immediate vicinity of the patient and therefore, gown and gloves were indicated.

Gown and gloves use process measure data are reported using the *MDRO and CDI Monthly Denominator Form* (CDC 57.127). See *Tables of Instructions* for completion instructions.

Data Analysis: Data are stratified by time (for example, month, quarter, etc.) and patient care location. *Gown and Glove Use Percent Adherence* = Number of contacts for which gown and gloves were used appropriately / Number of contacts for which gown and gloves were indicated x 100

c. Monitoring Adherence to Active Surveillance Testing

Introduction: This option will allow facilities to monitor adherence to active surveillance testing (AST) of MRSA and/or VRE, using culturing or other methods.

Settings: Surveillance will occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care areas, (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (for example, surgical wards).

Requirements: Surveillance of AST adherence in at least one location in the healthcare facility for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). A facility may choose to report AST for MRSA and/or VRE in one or multiple patient care locations, as the facility deems appropriate. Ideally, this should be done in patient care locations also selected for Infection Surveillance or LabID Event reporting. To improve standardization of timing rules for AST specimen collection, classify admission specimens as those obtained on day 1 (admission date), day 2, or day 3 (specifically, ≤3 days). Classify discharge/transfer AST specimens as those collected on or after day 4 (specifically, >3 days).

Definitions:

AST Eligible Patients: Choose one of two methods for identifying patients that are eligible for AST:

All = All patients in the selected patient care area regardless of history of MRSA or VRE infection or colonization.

OR

NHx = All patients in the selected patient care area who have NO documented positive MRSA or VRE infection or colonization during the previous 12 months (as ascertained by either a facility's laboratory records or information provided by referring facilities); and no evidence of MRSA or VRE during stay in the patient care location (specifically, they are not in Contact Precautions).

Timing of AST: Choose one of two methods for reporting the timing of AST:

Adm = Specimens for AST obtained ≤3 days after admission,
OR
Both = Specimens for AST obtained ≤3 days after admission and, for patients' stays of >3 days, at the time of discharge/transfer. Discharge/transfer AST should include all discharges (including discharges from the facility or to other wards or deaths) and can include the most recent weekly AST if performed >3 days after admission to the patient care location. Discharge/transfer AST should not be performed on patients who tested positive on AST admission.

Numerator and Denominator Data: Use the *MDRO and CDI Monthly Denominator Form* (CDC 57.127) to indicate: 1) AST was performed during the month for MRSA and/or VRE, 2) AST-eligible patients, and 3) the timing of AST. No personal identifiers will be collected or reported. See Tables of Instructions for completion instructions.

Numerator: For each month during which AST is performed:

Admission AST Performed = Number of patients eligible for admission AST who had a specimen obtained for testing ≤3 days after admission,
AND/OR
Discharge/Transfer AST Performed = For patients' stays >3 days, the number of discharged or transferred patients eligible for AST who had a specimen obtained for testing prior to discharge, not including the admission AST.

Denominator: For each month during which AST is performed:

Admission AST Eligible = Number of patients eligible for admission AST (All or NHx),
AND/OR
Discharge/Transfer AST Eligible = Number of patients eligible for discharge/transfer AST (All or NHx) AND in the facility location >3 days AND negative if tested on admission.

Data Analysis: Data are stratified by patient care location and time (for example, month, quarter, etc.), according to AST-eligible patients monitored and the timing of AST.

Admission AST Percent Adherence = Number of patients with admission AST Performed / Number of patients admission AST eligible x 100

Discharge/transfer AST Percent Adherence = Number of patients with discharge/transfer AST performed / Number of patients discharge/transfer AST eligible x 100

2. Active Surveillance Testing Outcome Measures

Introduction: This option will allow facilities to use the results of AST to monitor the prevalent and incident rates of MRSA and/or VRE colonization or infection. This information will assist facilities in assessing the impact of intervention programs on MRSA or VRE transmission.

Settings: Surveillance will occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care, (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (for example, surgical wards).

Requirements: Surveillance for prevalent and/or incident MRSA or VRE cases in at least one location in the healthcare facility for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). This can be done ONLY in locations where AST adherence is being performed. A minimum AST adherence level will be required for the system to calculate prevalence and incidence. A facility may choose to report AST for MRSA and/or VRE in one or multiple patient care locations, as the facility deems appropriate. Ideally, this should be done in patient care locations also selected for Infection Surveillance or LabID Event reporting. To improve standardization of timing rules for AST specimen collection, classify admission specimens as those obtained on day 1 (admission date), day 2, or day 3 (specifically, ≤3 days). Classify discharge/transfer AST specimens as those collected on or after day 4 (specifically, >3 days). Only the first specimen positive for MRSA or VRE from a given patient in the patient care location is counted, whether obtained for AST or as part of clinical care. If an Admission AST specimen is not collected from an eligible patient, assume the patient has no MRSA or VRE colonization.

Definitions:

AST Admission Prevalent case:

Known Positive = A patient with documentation on admission of MRSA or VRE colonization or infection in the previous 12 months (specifically, patient is known to be colonized or infected as ascertained by either a facility's laboratory records or information provided by referring facilities). (All MRSA or VRE colonized patients currently in a location during the month of surveillance should be considered "Known Positive"),

OR

Admission AST or Clinical Positive = A patient with MRSA or VRE isolated from a specimen collected for AST ≤3 days after admission or from clinical specimen obtained ≤3 days after admission (specifically, MRSA or VRE cannot be attributed to this patient care location).

AST Incident case: A patient with a stay >3 days:

With no documentation on admission of MRSA or VRE colonization or infection during the previous 12 months (as ascertained either by the facility's laboratory records or information provided by referring facilities); including admission AST or clinical culture obtained ≤3 days after admission (specifically, patient without positive specimen),

AND

With MRSA or VRE isolated from a specimen collected for AST or clinical reasons > 3 days after admission to the patient care location or at the time of discharge/transfer from the patient care location (including discharges from the facility or to other locations or deaths).

MRSA colonization: Carriage of MRSA without evidence of infection (for example, nasal swab test positive for MRSA, without signs or symptoms of infection).

AST Eligible Patients: Choose one of two methods for identifying patients' eligible for AST:

All = All patients in the selected patient care area regardless of history of MRSA or VRE infection or colonization,

OR

NHx = All patients in the selected patient care area who have NO documented positive MRSA or VRE infection or colonization during the previous 12 months (as ascertained either by the facility's laboratory records or information provided by referring facilities); and no evidence of MRSA or VRE during stay in the patient care location.

Timing of AST: Choose one of two methods for reporting the timing of AST:

Adm = Specimens for AST obtained ≤3 days after admission,

OR

Both = Specimens for AST obtained ≤3 days after admission and, for patients' stays of >3 days, at the time of discharge/transfer. Discharge/transfer AST should include all discharges (including discharges from the facility or to other wards or deaths) and can include the most recent weekly AST if performed >3 days after admission to the patient care location. Discharge/transfer AST should not be performed on patients who tested positive on AST admission.

Numerator and Denominator Data: Use the *MDRO and CDI Monthly Denominator Form* (CDC 57.127) to indicate: 1) AST outcomes monitoring and adherence was performed during the month for MRSA and/or VRE, 2) AST eligible patients, and 3) the timing of AST. No personal identifiers will be collected or reported. *See Tables of Instructions* for completion instructions.

If only admission AST is performed, only prevalent cases of MRSA or VRE can be detected in that patient care location. If both admission and discharge/transfer AST are performed, both prevalent and incident cases can be detected. No personal identifiers will be collected or reported.

Admission Prevalent Case:
Numerator Sources: (1) Known Positive; (2) Admission AST or Clinical Positive = Cases ≤3 days after admission
Denominator Source: Total number of admissions

Incident Case:
Numerator: Discharge/transfer AST or Clinical Positive = Cases >3 days after admission and without positive test result(s) on admission

Denominator: Total number of patient days

Note: For research purposes calculating patient-days at risk (specifically, excluding patient-days in which patients were known to be MRSA or VRE colonized or infected) may be a preferable denominator, but for surveillance purposes and ease of aggregating, total number of patient days is required for this module.

Data Analysis: Data are stratified by patient care location and time (for example, month, quarter, etc.) according to the eligible patients monitored and timing of AST.

AST Admission Prevalence rate =
For Eligible patients = All:
Number of admission AST or clinical positive / Number of admissions x 100

For Eligible patients = NHx:
Number of admission AST or clinical positive + Number of known positive / Number of admissions x 100

AST Incidence rate =
Number of discharge/transfer AST or clinical positive / Number of patient days x 1000

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[1]HICPAC, Management of Multidrug-Resistant Organisms in Healthcare Settings. <http://www.cdc.gov/NCIDOD/DHQP/hicpac_pubs.html>.

[2]Cohen AL, et al. *Infection Control and Hospital Epidemiology*. Oct 2008; 29:901-913.

[3]McDonald LC, Coignard B, Dubberke E, Song X. Horan T, Kutty PK. Recommendations for surveillance of Clostridium difficile-associated disease. *Infection Control Hospital Epidemiology* 2007; 28:140-5.

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Appendix 1. Guidance for Handling MDRO and CDI Module Infection Surveillance and LabID Event Reporting When Also Following Other NHSN Modules

If a facility is monitoring CLABSIs, CAUTIs, VAPs, or VAEs within the Device-Associated Module and/or SSIs within the Procedure-Associated Module and is also monitoring MDROs (for example, MRSA) in the MDRO and CDI Module, then there are a few situations where reporting the infection or LabID event may be confusing. The following scenarios provide guidance to keep the counts and rates consistent throughout your facility and between all of the NHSN Modules. *These rules apply to the reporting of "Big 5" infections (BSI, UTI, PNEU, VAE, and SSI) caused by an MDRO selected for monitoring.*

Device-Associated Module with MDRO and CDI Module

Scenario 1: Facility is following CLABSI, CAUTI, VAP, or VAE along with MDRO Infection Surveillance and possibly LabID Event Reporting in the same location:
Healthcare-associated Infection identified for this location.

1. Report the infection (BSI, UTI, PNEU, or VAE).
2. Answer "Yes" to the MDRO infection question.

This fulfills the infection reporting requirements of both modules in one entry and lets the NHSN reporting tool know that this infection should be included in both the Device-Associated and the MDRO infection datasets and rates.

3. If following LabID event reporting in the same location, report also (separately) as a LabID Event (if meets the MDRO protocol criteria for LabID event).

Scenario 2: Facility is following BSI (CLABSI), UTI (CAUTI), PNEU/VAP, or VAE along with MDRO Infection Surveillance and possibly LabID Event Reporting in multiple locations:
The event date for the infection is the day of patient transfer from one location (the transferring location) to another location (the new location), or the next day.

1. Report the infection (BSI, UTI, PNEU and VAE) and attribute to the transferring location, if transferring location was following that Event Type (BSI, UTI, PNEU, VAE) on the day of Event, which occurred on the date of transfer, or the following day.
2. Answer "Yes" to the MDRO infection question, if the transferring location was following that MDRO on the day of Event, which occurred on the date of transfer, or the following day.
3. If, on the date of culture collection, the new location is following LabID event reporting, report also (separately) as a LabID Event and attribute to the new location (if meets the MDRO protocol criteria for LabID event).

Procedure-Associated Module with MDRO and CDI Module

Note: SSIs are associated with a procedure and not a patient location, but MDROs are connected with the patient location.

Scenario 3: Facility is following SSI along with MDRO Infection Surveillance and possibly LabID Event Reporting:
Patient has surgery, is transferred to a single unit for the remainder of the stay, and during the current stay acquires an SSI.

1. Report the infection (SSI) and attribute to the post-op location.
2. Answer "Yes" to the MDRO infection question, if the post-op location is following that MDRO during the month of the date of event.
3. If following LabID event reporting in the post-op location, report also (separately) as a LabID Event (if meets the MDRO protocol criteria for LabID event).

Scenario 4: Facility is following SSI along with MDRO Infection Surveillance and possibly LabID Event Reporting:
Patient has surgery, is either discharged immediately (outpatient) or transferred to a unit (inpatient), is discharged, and subsequently is readmitted with an SSI.

1. Report the infection (SSI) and attribute to the discharging (post-op) location (not the readmission location).
2. Answer "Yes" to the MDRO infection question, if the discharging (post-op) location was following that MDRO during the Date of Event.
3. If following LabID event reporting in the readmitting location or outpatient clinic where the specimen was collected, report also (separately) as a LabID Event (if meets the MDRO protocol criteria for LabID event).

Appendix 2: Counts Involving Observation Patients

In response to questions regarding counting "observation" patients, the following guidance is offered.

For the purpose of NHSN surveillance and reporting, an "observation" location (for example, 24-hour observation area) is considered an outpatient unit, and time spent in this type of unit does not ever contribute to any inpatient counts (specifically, patient days, device days, admissions). Stays in such outpatient units represent "encounters" for the purposes of outpatient surveillance for LabID Event monitoring in the MDRO/CDI module.

The NHSN instructions for recording the number of patients in an inpatient unit state that for each day of the month selected, at the same time each day, the number of patients on the unit should be recorded. This procedure should be followed regardless of the patient's admission status as an observation patient or an inpatient.

Key point -- it is the patient's physical location and NOT the patient's admission status as an "observation" patient that determines whether the patient counts for an inpatient location or the 24 hour observation location

1. Observation patient in **observation location**:

   When an observation patient is housed in a location that is mapped as a 24-hr Observation area, they should not be included in any inpatient counts. These areas are considered outpatient locations.

2. Observation patient in **inpatient location:**

   a. If an observation patient is transferred to an inpatient location:

      - LabID event reporting -- Only patient days in the inpatient location are to be included in patient day counts for the location or FacWideIN. These counts should be inclusive of all patients housed in the inpatient location, regardless of their status as an observation patient.

      - Device-associated surveillance -- Device-day denominator data accrue beginning when the patient arrives in any inpatient location where surveillance is occurring, in accordance with the location's device-count methods.

   b. If an observation patient is admitted to an inpatient location, the patient must be included in all surveillance events designated in the monthly reporting plan and included in patient and device day counts. The patient is being housed, monitored, and cared for in an inpatient location and therefore is at risk for acquisition of an HAI. The facility assignment of the patient as an observation patient or an inpatient has no bearing for the purpose of counting.

Below is an example of attributing patient days to a patient admitted to an inpatient location, regardless of whether the facility considers the patient an observation patient or an inpatient.

The examples show counts taken at: A) 12:00 am and B) 11:00 pm.

A. Count at 12:00 am (midnight):

Date	Mr X Pt Day	Mr Y Pt Day
01/01	Mr X admitted at 8:00 pm Mr X not counted because the count for 01/01/10 was taken at 12:00 am on 01/01 10 and he was not yet admitted X	Mr Y admitted at 12:00 am Mr Y is counted because the count for 01/01 was taken at 12:00 am and that is when he was admitted 1
01/02	1	2
01/03	2	3
01/04	3	4
01/05	Mr X discharged at 5:00 pm 4 Counted for 01/05 because he was in the hospital at 12:00 am on 01/05 when the count for that day was taken	Mr Y discharged at 12:01 am 5 Counted for 01/05 because he was in the hospital at 12:00 am on 01/05 when the count for that day was taken
Total	**4 patient days**	**5 patient days**

If we use the same admission dates and times for Mr. X, but a different time is selected for the patient day count, say 11:00 pm, the total number of days in the count will be the same; they will simply be coming from different dates.

B. Count at 11:00 pm:

Date	Mr X	Pt Day
01/01	Mr X admitted at 8:00 am	Counted because the count for 01/01 is taken at 11:00 pm on 01/01 and he is in the hospital at that time 1
01/02		2
01/03		3
01/04		4
01/05	MR X discharged at 5:00 pm	Not counted for 01/05 because he was not in the hospital at 11:00 pm on 01/05 when the count for that day was taken X
Total		**4 patient days**

Determining Admission Counts for Summary Data Collection:

In response to questions regarding how to count number of admissions, the following guidance is offered. How you operationalize this guidance will depend on how you are obtaining the data for your counts.

Recognizing that there are a variety of ways in which patient day and admission counts are obtained for a facility and for specific locations, this guidance is offered to assist with standardization within and across facilities. It is most important that whatever method is used by a facility, it should be used each and every month for consistency of data and metrics.

If admissions are calculated electronically, the data must be checked to ensure that all appropriate patients are included or excluded from those counts and that, for three consecutive months, your electronic data are within +/- 5% of the number obtained by manual counts. If these counts are more than 5% discrepant, then you will need to evaluate and discuss with your IT staff to determine the cause of the discrepancies and methods to address them. The main goal is to accurately count patients in the denominators that may contribute to the numerator.

See below for specific examples:

1. Facility-Wide Inpatient Admission Count: Include any new patients that are assigned to a bed in any inpatient location within the facility regardless of billing status. Qualification as a new patient means that the patient was not present on the previous calendar day. The daily admission counts are summed at the end of the calendar month for a monthly facility-wide inpatient admission count.

2. Inpatient Location-Specific Admission Count: Include any new patients that are assigned to a bed in the specific inpatient location. Qualification as a new patient means that the patient was not present in the

specific inpatient location on the previous calendar day. The daily admission counts are summed at the end of the calendar month for a monthly inpatient location-specific admission count.

Any patient who meets criteria for new inclusion should be counted, regardless of whether they are coded by the facility as an inpatient or as an observation patient.

Below is an example of manually counting location-specific and facility-wide admission counts related to a patient admitted to an inpatient location and transferred to multiple patient locations during his hospital stay. The example show counts taken at 11:00 pm.

Example: Counts at 11:00 pm:

Unit	Date/Time Mr. X Placed on Inpatient Unit	Date/Time Mr. X Transferred Out of Inpatient Unit	Inpatient Location-Specific Admission Count	Inpatient Facility-Wide Admission Count
SICU	10/08 – 10:00am (facility admission)	10/13 – 9:00am	1 Adm for SICU	1 Adm for FacWideIN
MICU	10/13 – 9:15am	10/13 – 11:00am	Not present and so not counted	Same Adm, and also not present so not counted
Surgical Ward	10/13 – 11:30am	10/25 – 1:00pm	1 Adm for Surgical Ward	Same Adm so not counted
Medical Ward	10/25 – 1:30pm	10/26 – 10:00am (facility discharge)	1 Adm for Medical Ward	Same Adm so not counted

Appendix 3: Differentiating Between LabID Event and Infection Surveillance

	LabID Event	Infection Surveillance (using HAI surveillance definitions)
Protocol	LabID Event protocol in Chapter 12 of NHSN manual	Infection Surveillance protocol in Chapter 12 of NHSN manual and HAI site-specific definitions in NHSN manual (for example, BSI, UTI, SSI, PNEU, VAE, and GI-CDI and other HAI definitions)
Signs & Symptoms	NONE. Laboratory and admission data, without clinical evaluation of patient	Combination of laboratory data and clinical evaluation of patient (signs/symptoms)
Surveillance Rules	• HAI and POA do **NOT** apply • Transfer Rule does **NOT** apply • Location = location of patient at time of specimen collection • Event date = specimen collection date	• HAI and POA **do** apply • Transfer Rule applies • See NHSN protocol for details regarding location and date of event
Denominator Reporting	• Number of patient days and admissions • Can be reported by specific location or facility-wide, depending on reporting option(s) selected • Inpatient and/or outpatient	• Device days and patient days must be collected separately for each monitored location • Inpatient reporting only

Categorization of Infections	• Events categorized based on inpatient or outpatient and admission and specimen collection dates
	  • Healthcare Facility-Onset (HO)
	  • Community-Onset (CO)
	  • Community-Onset Healthcare Facility-Associated (CO-HCFA) for *C. difficile* only
	• HO,CO, and CO-HCFA (if applicable) LabID Events must be reported to NHSN
	• Additional categorizations are applied to *C. difficile*, which include Incident CDI event and Recurrent CDI event. Both must be reported to NHSN.
		• HAI protocols used
		• Events are either HAI or not, therefore LabID Event categorizations **do not** apply
		• Only HAIs are reported to NHSN

Colorectal Cancer Screening (COL)

SUMMARY OF CHANGES TO HEDIS 2020

- Modified value sets to make them compatible with digital measure formatting.
- Updated value sets used to identify advanced illness.
- Updated the Hybrid specification to indicate that a result is not required if the documentation is clearly part of the member's medical history.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 50–75 years of age who had appropriate screening for colorectal cancer.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicare (report each product line separately).
Stratification	For only Medicare, report the following SES stratifications and total: • Non-LIS/DE, Nondisability. • LIS/DE. • Disability. • LIS/DE and Disability. • Other. • Unknown. • Total Medicare. ***Note:*** *The stratifications are mutually exclusive, and the sum of all six stratifications is the Total population.*
Ages	51–75 years as of December 31 of the measurement year.
Continuous enrollment	The measurement year and the year prior to the measurement year.
Allowable gap	No more than one gap in continuous enrollment of up to 45 days during each year of continuous enrollment.
Anchor date	December 31 of the measurement year.
Benefit	Medical.
Event/diagnosis	None.

Exclusions

Exclude members who meet any of the following criteria:

Note: *Supplemental and medical record data may not be used for these exclusions.*

- Medicare members 66 years of age and older as of December 31 of the measurement year who meet either of the following:
  - Enrolled in an Institutional SNP (I-SNP) any time during the measurement year.
  - Living long-term in an institution any time during the measurement year as identified by the LTI flag in the Monthly Membership Detail Data File. Use the run date of the file to determine if a member had an LTI flag during the measurement year.
- Members 66 years of age and older as of December 31 of the measurement year (all product lines) with frailty ***and*** advanced illness. Members must meet **BOTH** of the following frailty and advanced illness criteria to be excluded:
  1. At least one claim/encounter for frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) during the measurement year.
  2. Any of the following during the measurement year or the year prior to the measurement year (count services that occur over both years):
     - At least two outpatient visits (Outpatient Value Set), observation visits (Observation Value Set), ED visits (ED Value Set),nonacute inpatient encounters (Nonacute Inpatient Value Set) or nonacute inpatient discharges (instructions below; the diagnosis must be on the discharge claim) on different dates of service, with an advanced illness diagnosis (Advanced Illness Value Set). Visit type need not be the same for the two visits. To identify a nonacute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
       2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim.
       3. Identify the discharge date for the stay.
     - At least one acute inpatient encounter (Acute Inpatient Value Set) with an advanced illness diagnosis (Advanced Illness Value Set).
     - At least one acute inpatient discharge with an advanced illness diagnosis (Advanced Illness Value Set). To identify an acute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
       2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
       3. Identify the discharge date for the stay.
     - A dispensed dementia medication (Dementia Medications List).

Dementia Medications

Description	Prescription
Cholinesterase inhibitors	• Donepezil • Galantamine • Rivastigmine
Miscellaneous central nervous system agents	• Memantine

Administrative Specification

Denominator The eligible population.

Numerator One or more screenings for colorectal cancer. Any of the following meet criteria:

- Fecal occult blood test (FOBT Lab Test Value Set; FOBT Test Result or Finding Value Set) during the measurement year. For administrative data, assume the required number of samples were returned, regardless of FOBT type.
- Flexible sigmoidoscopy (Flexible Sigmoidoscopy Value Set; History of Flexible Sigmoidoscopy Value Set) during the measurement year or the four years prior to the measurement year.
- Colonoscopy (Colonoscopy Value Set; History of Colonoscopy Value Set) during the measurement year or the nine years prior to the measurement year.
- CT colonography (CT Colonography Value Set) during the measurement year or the four years prior to the measurement year.
- FIT-DNA test (FIT DNA Lab Test Value Set; FIT DNA Test Result or Finding Value Set) during the measurement year or the two years prior to the measurement year.

Exclusion *(optional)*

Either of the following any time during the member's history through December 31 of the measurement year:

- Colorectal cancer (Colorectal Cancer Value Set).
- Total colectomy (Total Colectomy Value Set; History of Total Colectomy Value Set).

Hybrid Specification

Denominator A systematic sample drawn from the eligible population for each product line. Organizations may reduce the sample size using the current year's administrative rate or the prior year's audited, product line-specific rate. Refer to the *Guidelines for Calculations and Sampling* for information on reducing the sample size.

For Medicare reporting, the denominator (MRSS) for the Total category is the entire systematic sample. Do not pull samples for each stratification. The individual stratifications for the denominators and all numerators must sum to the totals.

Numerator

One or more screenings for colorectal cancer. Appropriate screenings are defined by one of the following:

- FOBT during the measurement year.
- Flexible sigmoidoscopy during the measurement year or the four years prior to the measurement year.
- Colonoscopy during the measurement year or the nine years prior to the measurement year.
- CT colonography during the measurement year or the four years prior to the measurement year.
- FIT-DNA during the measurement year or the two years prior to the measurement year.

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record

Documentation in the medical record must include a note indicating the date when the colorectal cancer screening was performed. A result is not required if the documentation is clearly part of the member's "medical history"; if this is not clear, the result or finding must also be present (this ensures that the screening was performed and not merely ordered).

A pathology report that indicates the type of screening (e.g., colonoscopy, flexible sigmoidoscopy) and the date when the screening was performed meets criteria.

For pathology reports that do not indicate the type of screening and for incomplete procedures:

- Evidence that the scope advanced beyond the splenic flexure meets criteria for a completed colonoscopy.
- Evidence that the scope advanced into the sigmoid colon meets criteria for a completed flexible sigmoidoscopy.

There are two types of FOBT tests: guaiac (gFOBT) and immunochemical (FIT). Depending on the type of FOBT test, a certain number of samples are required for numerator compliance. Follow the instructions below to determine member compliance.

- If the medical record does not indicate the type of test and there is no indication of how many samples were returned, assume the required number was returned. The member meets the screening criteria for inclusion in the numerator.
- If the medical record does not indicate the type of test and the number of returned samples is specified, the member meets the screening criteria only if the number of samples specified is greater than or equal to three samples. If there are fewer than three samples, the member does not meet the screening criteria for inclusion.
- FIT tests may require fewer than three samples. If the medical record indicates that an FIT was done, the member meets the screening criteria, regardless of how many samples were returned.

- If the medical record indicates that a gFOBT was done, follow the scenarios below.
  - *If the medical record does not indicate the number of returned samples,* assume the required number was returned. The member meets the screening criteria for inclusion in the numerator.
  - *If the medical record indicates that three or more samples were returned,* the member meets the screening criteria for inclusion in the numerator.
  - *If the medical record indicates that fewer than three samples were returned,* the member does not meet the screening criteria.

Do not count digital rectal exams (DRE), FOBT tests performed in an office setting or performed on a sample collected via DRE.

Exclusion *(optional)*

Refer to *Administrative Specification* for exclusion criteria. Exclusionary evidence in the medical record must include a note indicating colorectal cancer or total colectomy any time during the member's history through December 31 of the measurement year.

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table COL-2: Data Elements for Colorectal Cancer Screening

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		✓
Current year's administrative rate (before exclusions)		✓
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		✓
Administrative rate on MRSS		✓
Number of medical records excluded because of valid data errors		✓
Number of administrative data records excluded		✓
Number of medical records excluded		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	✓	✓
Numerator events by medical records		✓
Numerator events by supplemental data	✓	✓
Reported rate	✓	✓

Table COL-3: Data Elements for Colorectal Cancer Screening

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	*Each of the 6 stratifications and total*	*Each of the 6 stratifications and total*
Number of numerator events by administrative data in eligible population (before exclusions)		✓
Current year's administrative rate (before exclusions)		✓
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversampling records		✓
Number of numerator events by administrative data in MRSS		✓
Administrative rate on MRSS		✓
Number of medical records excluded because of valid data errors		✓
Number of administrative data records excluded		✓
Number of medical records excluded		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		*Each of the 6 stratifications and total*
Numerator events by administrative data	*Each of the 6 stratifications and total*	*Each of the 6 stratifications and total*
Numerator events by medical records		*Each of the 6 stratifications and total*
Numerator events by supplemental data	*Each of the 6 stratifications and total*	*Each of the 6 stratifications and total*
Reported rate	*Each of the 6 stratifications and total*	*Each of the 6 stratifications and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Colorectal Cancer Screening

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	The age determination dates may be changed (e.g., select, "age as of June 30"). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefit	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	NA	There is no event/diagnosis for this measure.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Value sets may not be changed.
Exclusions: I-SNP, LTI, Frailty or Advanced Illness	Yes	These exclusions are not required. Refer to *Exclusions* in the *Guidelines for the Rules for Allowable Adjustments*.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Colorectal Cancer Screening	No	The value sets and the logic may not be changed.

Comprehensive Diabetes Care (CDC)

SUMMARY OF CHANGES TO HEDIS 2020

- Modified value sets to make them compatible with digital measure formatting.
- Removed "with or without a telehealth modifier" language; refer to *General Guideline 43*.
- Updated value sets to identify acute and nonacute inpatient events for the event/diagnosis.
- Updated value sets used to identify advanced illness.
- Updated value sets to identify IVD acute inpatient events.
- Updated value sets to identify thoracic aortic aneurysm inpatient events.
- Clarified the telehealth requirements.
- Removed the telehealth exclusion from ESRD.
- Reformatted the denominator of the Hybrid Specification.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 18–75 years of age with diabetes (type 1 and type 2) who had each of the following:

- Hemoglobin A1c (HbA1c) testing.
- HbA1c poor control (>9.0%).
- HbA1c control (<8.0%).
- HbA1c control (<7.0%) for a selected population*****.
- Eye exam (retinal) performed.
- Medical attention for nephropathy.
- BP control (<140/90 mm Hg).

**Additional exclusion criteria are required for this indicator that will result in a different eligible population from all other indicators. This indicator is only reported for the commercial and Medicaid product lines.*

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines Commercial, Medicaid, Medicare (report each product line separately).

Stratification For only Medicare, for only the Eye Exam (retinal) indicator, report the following SES stratifications and total:

- Non-LIS/DE, Nondisability.
- LIS/DE.
- Disability.
- LIS/DE and Disability.
- Other.
- Unknown.
- Total Medicare.

Note: *The stratifications are mutually exclusive, and the sum of all six stratifications is the Total population. The stratifications are reported in a separate table.*

Ages 18–75 years as of December 31 of the measurement year.

Continuous enrollment The measurement year.

Allowable gap No more than one gap in enrollment of up to 45 days during the measurement year. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).

Anchor date December 31 of the measurement year.

Benefit Medical.

Event/diagnosis There are two ways to identify members with diabetes: by claim/encounter data and by pharmacy data. The organization must use both methods to identify the eligible population, but a member only needs to be identified by one method to be included in the measure. Members may be identified as having diabetes during the measurement year or the year prior to the measurement year.

Claim/encounter data. Members who met any of the following criteria during the measurement year or the year prior to the measurement year (count services that occur over both years):

- At least one acute inpatient encounter (Acute Inpatient Value Set) with a diagnosis of diabetes (Diabetes Value Set) ***without*** telehealth (Telehealth Modifier Value Set; Telehealth POS Value Set).
- At least one acute inpatient discharge with a diagnosis of diabetes (Diabetes Value Set) on the discharge claim. To identify an acute inpatient discharge:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
  3. Identify the discharge date for the stay.
- At least two outpatient visits (Outpatient Value Set), observation visits (Observation Value Set), telephone visits (Telephone Visits Value Set), online assessments (Online Assessments Value Set), ED visits (ED Value Set), nonacute inpatient encounters (Nonacute Inpatient Value Set) or nonacute inpatient discharges (instructions below; the diagnosis must be on the discharge claim), on different dates of service, with a diagnosis of diabetes (Diabetes Value Set). Visit type need not be the same for the two encounters. To identify a nonacute inpatient discharge:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim.
  3. Identify the discharge date for the stay.

Only include nonacute inpatient encounters (Nonacute Inpatient Value Set) ***without*** telehealth (Telehealth Modifier Value Set; Telehealth POS Value Set).

Only one of the two visits may be an outpatient telehealth visit, a telephone visit or an online assessment. Identify outpatient telehealth visits by the presence of a telehealth modifier (Telehealth Modifier Value Set) or the presence of a telehealth POS code (Telehealth POS Value Set) associated with the outpatient visit.

Pharmacy data. Members who were dispensed insulin or hypoglycemics/ antihyperglycemics on an ambulatory basis during the measurement year or the year prior to the measurement year (Diabetes Medications List).

Diabetes Medications

Description	Prescription		
Alpha-glucosidase inhibitors	• Acarbose	• Miglitol	
Amylin analogs	• Pramlinitide		
Antidiabetic combinations	• Alogliptin-metformin • Alogliptin-pioglitazone • Canagliflozin-metformin • Dapagliflozin-metformin • Empaglifozin-linagliptin	• Empagliflozin-metformin • Glimepiride-pioglitazone • Glipizide-metformin • Glyburide-metformin • Linagliptin-metformin	• Metformin-pioglitazone • Metformin-repaglinide • Metformin-rosiglitazone • Metformin-saxagliptin • Metformin-sitagliptin
Insulin	• Insulin aspart • Insulin aspart-insulin aspart protamine • Insulin degludec • Insulin detemir • Insulin glargine • Insulin glulisine	• Insulin isophane human • Insulin isophane-insulin regular • Insulin lispro • Insulin lispro-insulin lispro protamine • Insulin regular human • Insulin human inhaled	
Meglitinides	• Nateglinide	• Repaglinide	
Glucagon-like peptide-1 (GLP1) agonists	• Dulaglutide • Exenatide	• Albiglutide • Liraglutide	
Sodium glucose cotransporter 2 (SGLT2) inhibitor	• Canagliflozin	• Dapagliflozin	• Empagliflozin
Sulfonylureas	• Chlorpropamide • Glimepiride	• Glipizide • Glyburide	• Tolazamide • Tolbutamide
Thiazolidinediones	• Pioglitazone	• Rosiglitazone	
Dipeptidyl peptidase-4 (DDP-4) inhibitors	• Alogliptin • Linagliptin	• Saxagliptin • Sitagliptin	

Note: *Glucophage/metformin as a solo agent is not included because it is used to treat conditions other than diabetes; members with diabetes on these medications are identified through diagnosis codes only.*

Exclusions

Exclude members who meet any of the following criteria:

Note: *Supplemental and medical record data may not be used for these exclusions.*

- Medicare members 66 years of age and older as of December 31 of the measurement year who meet either of the following:
  - Enrolled in an Institutional SNP (I-SNP) any time during the measurement year.
  - Living long-term in an institution any time during the measurement year as identified by the LTI flag in the Monthly Membership Detail Data File. Use the run date of the file to determine if a member had an LTI flag during the measurement year.
- Members 66 years of age and older as of December 31 of the measurement year (all product lines) with frailty ***and*** advanced illness. Members must meet **BOTH** of the following frailty and advanced illness criteria to be excluded:
  1. At least one claim/encounter for frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) during the measurement year.
  2. Any of the following during the measurement year or the year prior to the measurement year (count services that occur over both years):
     - At least two outpatient visits (Outpatient Value Set), observation visits (Observation Value Set), ED visits (ED Value Set), nonacute inpatient encounters (Nonacute Inpatient Value Set) or nonacute inpatient discharges (instructions below) on different dates of service, with an advanced illness diagnosis (Advanced Illness Value Set). Visit type need not be the same for the two visits. To identify a nonacute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
       2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim.
       3. Identify the discharge date for the stay.
     - At least one acute inpatient encounter (Acute Inpatient Value Set) with an advanced illness diagnosis (Advanced Illness Value Set).
     - At least one acute inpatient discharge with an advanced illness diagnosis (Advanced Illness Value Set). To identify an acute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
       2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
       3. Identify the discharge date for the stay.
     - A dispensed dementia medication (Dementia Medications List).

Dementia Medications

Description	Prescription
Cholinesterase inhibitors	• Donepezil • Galantamine • Rivastigmine
Miscellaneous central nervous system agents	• Memantine

Administrative Specification

Denominator

The eligible population.

Note: *The eligible population for the HbA1c Control <7% for a Selected Population indicator is reported after required exclusions are applied.*

Required exclusions for HbA1c Control <7% for a Selected Population indicator

Exclude members who meet any of the following criteria:

- 65 years of age and older as of December 31 of the measurement year.
- *CABG.* Members who had CABG (CABG Value Set) in any setting during the measurement year or the year prior to the measurement year.
- *PCI*. Members who had PCI (PCI Value Set), in any setting, during the measurement year or the year prior to the measurement year.
- *IVD.* Members who met at least one of the following criteria during both the measurement year and the year prior to the measurement year. Criteria need not be the same across both years.
  - At least one outpatient visit (Outpatient Value Set) with an IVD diagnosis (IVD Value Set).
  - A telephone visit (Telephone Visits Value Set) with an IVD diagnosis (IVD Value Set).
  - An online assessment (Online Assessments Value Set) with an IVD diagnosis (IVD Value Set).
  - At least one acute inpatient encounter (Acute Inpatient Value Set) with an IVD diagnosis (IVD Value Set) ***without*** telehealth (Telehealth Modifier Value Set; Telehealth POS Value Set).
  - At least one acute inpatient discharge with an IVD diagnosis (IVD Value Set) on the discharge claim. To identify an acute inpatient discharge:
    1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
    2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
    3. Identify the discharge date for the stay.

  Only one of the two visits may be an outpatient telehealth visit, a telephone visit or an online assessment. Identify outpatient telehealth visits by the presence of a telehealth modifier (Telehealth Modifier Value Set) or the presence of a telehealth POS code (Telehealth POS Value Set) associated with the outpatient visit.

- *Thoracic aortic aneurysm.* Members who met at least one of the following criteria during both the measurement year and the year prior to the measurement year. Criteria need not be the same across both years.
  - At least one outpatient visit (Outpatient Value Set), with a diagnosis of thoracic aortic aneurysm (Thoracic Aortic Aneurysm Value Set).
  - At least one acute inpatient encounter (Acute Inpatient Value Set), with a diagnosis of thoracic aortic aneurysm (Thoracic Aortic Aneurysm Value Set) ***without*** (Telehealth Modifier Value Set; Telehealth POS Value Set).
  - At least one acute inpatient discharge with a diagnosis of thoracic aortic aneurysm (Thoracic Aortic Aneurysm Value Set). To identify an acute inpatient discharge:
    1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
    2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
    3. Identify the discharge date for the stay.
- Any of the following, in any setting, any time during the member's history through December 31 of the measurement year.
  - *Chronic heart failure*. A diagnosis of chronic heart failure (Chronic Heart Failure Value Set).
  - *Prior MI*. A diagnosis of MI (MI Value Set).
  - *ESRD*. ESRD (ESRD Diagnosis Value Set) or dialysis (Dialysis Procedure Value Set).
  - *Chronic kidney disease (stage 4)*. Stage 4 chronic kidney disease (CKD Stage 4 Value Set).
  - *Dementia*. A diagnosis of dementia (Dementia Value Set; Frontotemporal Dementia Value Set).
  - *Blindness*. A diagnosis of blindness (Blindness Value Set).
  - *Amputation (lower extremity)*. Lower extremity amputation (Lower Extremity Amputation Value Set).

Numerators

HbA1c Testing An HbA1c test (HbA1c Lab Test Value Set; HbA1c Test Result or Finding Value Set) performed during the measurement year.

HbA1c Poor Control >9% Use codes (HbA1c Lab Test Value Set; HbA1c Test Result or Finding Value Set) to identify the *most recent* HbA1c test during the measurement year. The member is numerator compliant if the most recent HbA1c level is >9.0% or is missing a result, or if an HbA1c test was not done during the measurement year. The member is not numerator compliant if the result for the most recent HbA1c test during the measurement year is ≤9.0%.

Organizations that use CPT Category II codes to identify numerator compliance for this indicator must search for all codes in the following value sets and use the most recent code during the measurement year to evaluate whether the member is numerator compliant.

Value Set	Numerator Compliance
HbA1c Level Less Than 7.0 Value Set	Not compliant
HbA1c Level 7.0–9.0 Value Set	Not compliant
HbA1c Level Greater Than 9.0 Value Set	Compliant

Note: *A lower rate indicates better performance for this indicator (i.e., low rates of poor control indicate better care).*

HbA1c Control <8%

Use codes (HbA1c Lab Test Value Set; HbA1c Test Result or Finding Value Set) to identify the most recent HbA1c test during the measurement year. The member is numerator compliant if the most recent HbA1c level is <8.0%. The member is not numerator compliant if the result for the most recent HbA1c test is ≥8.0% or is missing a result, or if an HbA1c test was not done during the measurement year.

Organizations that use CPT Category II codes to identify numerator compliance for this indicator must search for all codes in the following value sets and use the most recent code during the measurement year to evaluate whether the member is numerator compliant.

Value Set	Numerator Compliance
HbA1c Level Less Than 7.0 Value Set	Compliant
HbA1c Level 7.0–9.0 Value Set	Not compliant*
HbA1c Level Greater Than 9.0 Value Set	Not compliant

HbA1c Control <7% for a Selected Population

Use codes (HbA1c Lab Test Value Set; HbA1c Test Result or Finding Value Set) to identify the most recent HbA1c test during the measurement year. The member is numerator compliant if the most recent HbA1c level is <7.0%. The member is not numerator compliant if the result for the most recent HbA1c test is ≥7.0% or is missing a result, or if an HbA1c test was not performed during the measurement year.

Organizations that use CPT Category II codes to identify numerator compliance for this indicator must search for all codes in the following value sets and use the most recent code during the measurement year to evaluate whether the member is numerator compliant.

***** The CPT Category II code (3045F) in this value set indicates most recent HbA1c (HbA1c) level 7.0%–9.0% and is not specific enough to denote numerator compliance for this indicator. For members with this code, the organization must use other sources (laboratory data, hybrid reporting method) to identify the actual value and determine if the HbA1c result was <8%. Because providers assign the Category II code after reviewing test results, the date of service for the Category II code may not match the date of service for the HbA1c test found in other sources; if dates differ, use the date of service when the test was performed. The date of service for the Category II code and the test result must follow the requirements outlined in *General Guideline 33: Measures That Require Results From the Most Recent Test or Measurement* (i.e., the dates of service for the code and the test result must be no more than seven days apart).

Value Set	Numerator Compliance
HbA1c Level Less Than 7.0 Value Set	Compliant
HbA1c Level 7.0–9.0 Value Set	Not compliant
HbA1c Level Greater Than 9.0 Value Set	Not compliant

Note: *This indicator uses the eligible population with additional eligible population criteria (e.g., removing members with required exclusions).*

Eye Exam Screening or monitoring for diabetic retinal disease as identified by administrative data. This includes diabetics who had one of the following:

- A retinal or dilated eye exam by an eye care professional (optometrist or ophthalmologist) in the measurement year.
- A *negative* retinal or dilated eye exam (negative for retinopathy) by an eye care professional in the year prior to the measurement year.
- Bilateral eye enucleation any time during the member's history through December 31 of the measurement year.

Any of the following meet criteria:

- Any code in the Diabetic Retinal Screening Value Set billed by an eye care professional (optometrist or ophthalmologist) during the measurement year.
- Any code in the Diabetic Retinal Screening Value Set billed by an eye care professional (optometrist or ophthalmologist) during the year prior to the measurement year, with a negative result (negative for retinopathy).
- Any code in the Diabetic Retinal Screening Value Set billed by an eye care professional (optometrist or ophthalmologist) during the year prior to the measurement year, with a diagnosis of diabetes without complications (Diabetes Mellitus Without Complications Value Set).
- Any code in the Diabetic Retinal Screening With Eye Care Professional Value Set billed by any provider type during the measurement year.
- Any code in the Diabetic Retinal Screening With Eye Care Professional Value Set billed by any provider type during the year prior to the measurement year, with a negative result (negative for retinopathy).
- Any code in the Diabetic Retinal Screening Negative Value Set billed by any provider type during the measurement year.
- Unilateral eye enucleation (Unilateral Eye Enucleation Value Set) ***with*** a bilateral modifier (Bilateral Modifier Value Set).
- Two unilateral eye enucleations (Unilateral Eye Enucleation Value Set) with service dates 14 days or more apart. For example, if the service date for the first unilateral eye enucleation was February 1 of the measurement year, the service date for the second unilateral eye enucleation must be on or after February 15.
- Left unilateral eye enucleation (Unilateral Eye Enucleation Left Value Set) ***and*** right unilateral eye enucleation (Unilateral Eye Enucleation Right Value Set) on the same or different dates of service.

- A unilateral eye enucleation (Unilateral Eye Enucleation Value Set) and a left unilateral eye enucleation (Unilateral Eye Enucleation Left Value Set) with service dates 14 days or more apart.
- A unilateral eye enucleation (Unilateral Eye Enucleation Value Set) and a right unilateral eye enucleation (Unilateral Eye Enucleation Right Value Set) with service dates 14 days or more apart.

Medical Attention for Nephropathy

A nephropathy screening or monitoring test ***or*** evidence of nephropathy, as documented through administrative data. This includes diabetics who had one of the following during the measurement year:

- A nephropathy screening or monitoring test (Urine Protein Tests Value Set).
- Evidence of treatment for nephropathy or ACE/ARB therapy (Nephropathy Treatment Value Set).
- Evidence of stage 4 chronic kidney disease (CKD Stage 4 Value Set).
- Evidence of ESRD (ESRD Diagnosis Value Set) or dialysis (Dialysis Procedure Value Set).
- Evidence of nephrectomy (Nephrectomy Value Set) or kidney transplant (Kidney Transplant Value Set).
- A visit with a nephrologist, as identified by the organization's specialty provider codes (no restriction on the diagnosis or procedure code submitted).
- At least one ACE inhibitor or ARB dispensing event (ACE Inhibitor and ARB Medications List).

Note: *A process flow diagram is included at the end of this specification to help implement this measure.*

ACE Inhibitor and ARB Medications

Description	Prescription				
Angiotensin converting enzyme inhibitors	• Benazepril • Captopril	• Enalapril • Fosinopril	• Lisinopril • Moexipril	• Perindopril • Quinapril	• Ramipril • Trandolapril
Angiotensin II inhibitors	• Azilsartan • Candesartan	• Eprosartan • Irbesartan	• Losartan • Olmesartan	• Telmisartan • Valsartan	
Antihypertensive combinations	• Amlodipine-benazepril • Amlodipine-hydrochlorothiazide-valsartan • Amlodipine-hydrochlorothiazide-olmesartan • Amlodipine-olmesartan • Amlodipine-perindopril • Amlodipine-telmisartan • Amlodipine-valsartan	• Azilsartan-chlorthalidone • Benazepril-hydrochlorothiazide • Candesartan-hydrochlorothiazide • Captopril-hydrochlorothiazide • Enalapril-hydrochlorothiazide • Fosinopril-hydrochlorothiazide • Hydrochlorothiazide-irbesartan • Hydrochlorothiazide-lisinopril • Hydrochlorothiazide-losartan	• Hydrochlorothiazide-moexipril • Hydrochlorothiazide-olmesartan • Hydrochlorothiazide-quinapril • Hydrochlorothiazide-telmisartan • Hydrochlorothiazide-valsartan • Sacubitril-valsartan • Trandolapril-verapamil		

BP Control <140/90 mm Hg

Identify the most recent BP reading (Systolic Blood Pressure Value Set; Diastolic Blood Pressure Value Set) taken during an outpatient visit (Outpatient Value Set) or a nonacute inpatient encounter (Nonacute Inpatient Value Set), or remote monitoring event (Remote Blood Pressure Monitoring Value Set) during the measurement year.

The member is numerator compliant if the BP is <140/90 mm Hg. The member is not compliant if the BP is ≥140/90 mm Hg, if there is no BP reading during the measurement year or if the reading is incomplete (e.g., the systolic or diastolic level is missing). If there are multiple BPs on the same date of service, use the lowest systolic and lowest diastolic BP on that date as the representative BP.

Organizations that use CPT Category II codes to identify numerator compliance for this indicator must search for all codes in the following value sets and use the most recent codes during the measurement year to determine numerator compliance for both systolic and diastolic levels.

Value Set	Numerator Compliance
Systolic Less Than 140 Value Set	Systolic compliant
Systolic Greater Than or Equal To 140 Value Set	Systolic not compliant
Diastolic Less Than 80 Value Set	Diastolic compliant
Diastolic 80–89 Value Set	Diastolic compliant
Diastolic Greater Than or Equal To 90 Value Set	Diastolic not compliant

Exclusions *(optional)*

Members who do not have a diagnosis of diabetes (Diabetes Value Set), in any setting, during the measurement year or the year prior to the measurement year ***and*** who had a diagnosis of gestational diabetes or steroid-induced diabetes (Diabetes Exclusions Value Set), in any setting, during the measurement year or the year prior to the measurement year.

Organizations that apply optional exclusions must exclude members from the denominator for all indicators. The denominator for all rates must be the same, with the exception of the *HbA1c Control (<7.0%) for a Selected Population* denominator.

If the member was included in the measure based on claim or encounter data, as described in the event/ diagnosis criteria, the optional exclusions do not apply because the member had a diagnosis of diabetes.

Hybrid Specification

Denominator—Organizations Not Reporting HbA1c Control <7%

Organizations should use a sample size of 411 if they do not report the *HbA1c Control <7% for a Selected Population* indicator. The *HbA1c Control <7% for a Selected Population* indicator is not collected or reported for the Medicare product line.

For Medicare reporting, the denominator for the Total Medicare SES stratification is the entire systematic sample. Do not pull samples for each stratification. The individual stratifications for the denominators and all numerators must sum to the total.

Denominator—Organizations Reporting HbA1c Control <7%

Organizations reporting the *HbA1c Control <7% for a Selected Population* indicator should use a sample size of 548 for each indicator. This sample size is based on the goal of achieving a denominator of at least 411 for the *HbA1c <7% for a Selected Population* indicator after required exclusions.

Organizations should use their prior experience with the number of required exclusions to determine the appropriate oversample percentage. Members who meet the required exclusion criteria for the *HbA1c Control <7% for a Selected Population* indicator are excluded from the *HbA1c Control <7% for a Selected Population* denominator. Report this indicator as 548 minus the required exclusions.

If the denominator drops below 411, use members from the oversample to bring the denominator back up to 411. Members added from the oversample must be added to the denominators for every measure indicator. This will result in some indicators having a denominator larger than 548. If the oversample was underestimated and all oversample members have been exhausted without satisfying the denominator of 411 for the *HbA1c Control <7% for a Selected Population* indicator, per the *Guidelines for Calculations and Sampling*, the organization must contact NCQA to determine next steps.

Note: *The eligible population for the HbA1c Control <7% for a Selected Population indicator is reported after required exclusions are applied.*

Denominator—Sample Size Reduction

The organization may reduce the sample size using the current year's administrative rate or the prior year's audited, product line-specific rate for the lowest rate among all the reported CDC indicators. The lowest rate for all reported indicators must be used when reducing the sample size.

If the organization chooses to reduce the sample size and report the *HbA1c Control <7% for a Selected Population* indicator, the sample size for this indicator must still be the appropriate sample size as specified in Table 2: Sample Sizes When Data Are Available on the Product Line Being Measured (in the *Guidelines for Calculations and Sampling*) after the required exclusions are removed.

Required exclusions for HbA1c Control <7% for a Selected Population

Administrative

Refer to *Administrative Specification* to identify required exclusions from administrative data.

Medical record

Exclude members who meet any of the following criteria:

- 65 years of age and older as of December 31 of the measurement year.
- *CABG.* Dated documentation of CABG in the measurement year or the year before the measurement year.
- *PCI.* Dated documentation of PCI in the measurement year or the year before the measurement year.
- *IVD.* Documentation of an IVD diagnosis. Look as far back as possible in the member's history through December 31 of the measurement year. Appropriate diagnoses include:
  - IVD.
  - Ischemic heart disease.
  - Angina.
  - Coronary atherosclerosis.
  - Coronary artery occlusion.
  - Cardiovascular disease.
  - Occlusion or stenosis of precerebral arteries (including basilar, carotid and vertebral arteries).
  - Atherosclerosis of renal artery.
  - Atherosclerosis of native arteries of the extremities.
  - Chronic total occlusion of artery of the extremities.
  - Arterial embolism and thrombosis.
  - Atheroembolism.
- *Thoracoabdominal or thoracic aortic aneurysm.* Documentation of thoracoabdominal aneurysm or thoracic aortic aneurysm. Look as far back as possible in the member's history through December 31 of the measurement year.
- *CHF.* Documentation of CHF or cardiomyopathy diagnosis. Look as far back as possible in the member's history through December 31 of the measurement year.
- *Prior MI. Documentation of prior MI.* Look as far back as possible in the member's history through December 31 of the measurement year.
- *ESRD. Documentation of stage 5 chronic kidney disease, ESRD or dialysis.* Look as far back as possible in the member's history through December 31 of the measurement year.
- *Chronic kidney disease (stage 4).* Documentation of stage 4 chronic kidney disease. Look as far back as possible in the member's history through December 31 of the measurement year.
- *Dementia.* Documentation of dementia. Look as far back as possible in the member's history through December 31 of the measurement year.
- *Blindness.* Documentation of blindness in one or both eyes. Look as far back as possible in the member's history through December 31 of the measurement year.
- *Amputation (lower extremity).* Documentation of lower extremity amputation. Look as far back as possible in the member's history through December 31 of the measurement year.

Note: *For Hybrid reporting, search the medical record for required exclusions and apply them before determining if the member has a numerator hit. Organizations are not required to search for required exclusions if a member has an administrative hit for the indicator, but must exclude these members if they are discovered during medical record review.*

Numerators

HbA1c Testing An HbA1c test performed during the measurement year as identified by administrative data or medical record review.

Administrative Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record At a minimum, documentation in the medical record must include a note indicating the date when the HbA1c test was performed and the result or finding. Count notation of the following in the medical record:

- A1c.
- HbA1c
- HgbA1c.
- Hemoglobin A1c.
- Glycohemoglobin A1c.
- Glycohemoglobin.
- Glycated hemoglobin.
- Glycosylated hemoglobin.

HbA1c Poor Control >9% The *most recent* HbA1c level (performed during the measurement year) is >9.0% or is missing, or was not done during the measurement year, as documented through laboratory data or medical record review.

Note: *A lower rate indicates better performance for this indicator (i.e., low rates of poor control indicate better care).*

Administrative Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record At a minimum, documentation in the medical record must include a note indicating the date when the HbA1c test was performed and the result. The member is numerator compliant if the result for the most recent HbA1c level during the measurement year is >9.0% or is missing, or if an HbA1c test was not done during the measurement year. The member is not numerator compliant if the most recent HbA1c level during the measurement year is ≤9.0%.

Ranges and thresholds do not meet criteria for this indicator. A distinct numeric result is required for numerator compliance.

HbA1c Control <8% The *most recent* HbA1c level (performed during the measurement year) is <8.0% as identified by laboratory data or medical record review.

Administrative Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record At a minimum, documentation in the medical record must include a note indicating the date when the HbA1c test was performed and the result. The member is numerator compliant if the most recent HbA1c level during the measurement year is <8.0%. The member is not numerator compliant if the result for the most recent HbA1c level during the measurement year is ≥8.0% or is missing, or if an HbA1c test was not performed during the measurement year.

Ranges and thresholds do not meet criteria for this indicator. A distinct numeric result is required for numerator compliance.

HbA1c Control <7% for a Selected Population

The *most recent* HbA1c level (performed during the measurement year) is <7.0% as identified by laboratory data or medical record review.

Note: *This indicator uses the eligible population with additional eligible population criteria (i.e., removing members with comorbid conditions).*

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record

At a minimum, documentation in the medical record must include a note indicating the date when the HbA1c test was performed and the result. The member is numerator compliant if the most recent HbA1c level during the measurement year is <7.0%. The member is not numerator compliant if the result for the most recent HbA1c level during the measurement year is ≥7.0% or is missing, or if an HbA1c test was not performed during the measurement year.

Ranges and thresholds do not meet criteria for this indicator. A distinct numeric result is required for numerator compliance.

Eye Exam

Screening or monitoring for diabetic retinal disease as identified by administrative data or medical record review. This includes diabetics who had one of the following:

- A retinal or dilated eye exam by an eye care professional (optometrist or ophthalmologist) in the measurement year.
- A *negative* retinal or dilated exam (negative for retinopathy) by an eye care professional (optometrist or ophthalmologist) in the year prior to the measurement year.
- Bilateral eye enucleation any time during the member's history through December 31 of the measurement year.

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record

At a minimum, documentation in the medical record must include one of the following:

- A note or letter prepared by an ophthalmologist, optometrist, PCP or other health care professional indicating that an ophthalmoscopic exam was completed by an eye care professional (optometrist or ophthalmologist), the date when the procedure was performed and the results.
- A chart or photograph indicating the date when the fundus photography was performed and evidence that an eye care professional (optometrist or ophthalmologist) reviewed the results. Alternatively, results may be read by a qualified reading center that operates under the direction of a medical director who is a retinal specialist.
- Evidence that the member had bilateral eye enucleation or acquired absence of both eyes. Look as far back as possible in the member's history through December 31 of the measurement year.
- Documentation of a negative retinal or dilated exam by an eye care professional (optometrist or ophthalmologist) in the year prior to the measurement year, where results indicate retinopathy was not present (e.g., documentation of normal findings).

- Documentation does not have to state specifically "no diabetic retinopathy" to be considered negative for retinopathy; however, it must be clear that the patient had a dilated or retinal eye exam by an eye care professional (optometrist or ophthalmologist) and that retinopathy was not present. Notation limited to a statement that indicates "diabetes without complications" does not meet criteria.

Medical Attention for Nephropathy

A nephropathy screening or monitoring test during the measurement year ***or*** evidence of nephropathy during the measurement year, as documented through either administrative data or medical record review.

Note: *A process flow diagram is included at the end of this specification to help implement this measure.*

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record

Any of the following during the measurement year meet criteria for a nephropathy screening or monitoring test or evidence of nephropathy.

- A urine test for albumin or protein. At a minimum, documentation must include a note indicating the date when a urine test was performed, and the result or finding. Any of the following meet the criteria:
  - 24-hour urine for albumin or protein.
  - Timed urine for albumin or protein.
  - Spot urine (e.g., urine dipstick or test strip) for albumin or protein.
  - Urine for albumin/creatinine ratio.
  - 24-hour urine for total protein.
  - Random urine for protein/creatinine ratio.
- Documentation of a visit to a nephrologist.
- Documentation of a renal transplant.
- Documentation of medical attention for any of the following (no restriction on provider type):
  - Diabetic nephropathy.
  - ESRD.
  - Chronic renal failure (CRF).
  - Chronic kidney disease (CKD).
  - Renal insufficiency.
  - Proteinuria.
  - Albuminuria.
  - Renal dysfunction.
  - Acute renal failure (ARF).
  - Dialysis, hemodialysis or peritoneal dialysis.
- Evidence of ACE inhibitor/ARB therapy. Documentation in the medical record must include evidence that the member received ACE inhibitor/ ARB therapy during the measurement year. Any of the following meet criteria:
  - Documentation that a prescription for an ACE inhibitor/ARB was written during the measurement year.

- Documentation that a prescription for an ACE inhibitor/ARB was filled during the measurement year.
- Documentation that the member took an ACE inhibitor/ARB during the measurement year.

BP Control <140/90 mm Hg

The *most recent* BP level (taken during the measurement year) is <140/90 mm Hg, as documented through administrative data or medical record review.

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record

The organization should use the medical record from which it abstracts data for the other CDC indicators. If the organization does not abstract for other indicators, it should use the medical record of the provider that manages the member's diabetes. If that medical record does not contain a BP, the organization may use the medical record of another PCP or specialist from whom the member receives care.

Identify the most recent BP reading noted during the measurement year. Do not include BP readings that meet the following criteria:

- Taken during an acute inpatient stay or an ED visit.
- Taken on the same day as a diagnostic test or diagnostic or therapeutic procedure that requires a change in diet or change in medication on or one day before the day of the test or procedure, with the exception of fasting blood tests.
- Reported by or taken by the member.

BP readings from remote monitoring devices that are digitally stored and transmitted to the provider may be included. There must be documentation in the medical record that clearly states the reading was taken by an electronic device, and results were digitally stored and transmitted to the provider, and interpreted by the provider.

Note: *Member-reported results to the provider from a remote monitoring device are not acceptable.*

Identify the lowest systolic and lowest diastolic BP reading from the most recent BP notation in the medical record. If multiple readings were recorded for a single date, use the lowest systolic and lowest diastolic BP on that date as the representative BP. The systolic and diastolic results do not need to be from the same reading.

The member is not numerator compliant if the BP does not meet the specified threshold or is missing, or if there is no BP reading during the measurement year or if the reading is incomplete (i.e., the systolic or diastolic level is missing).

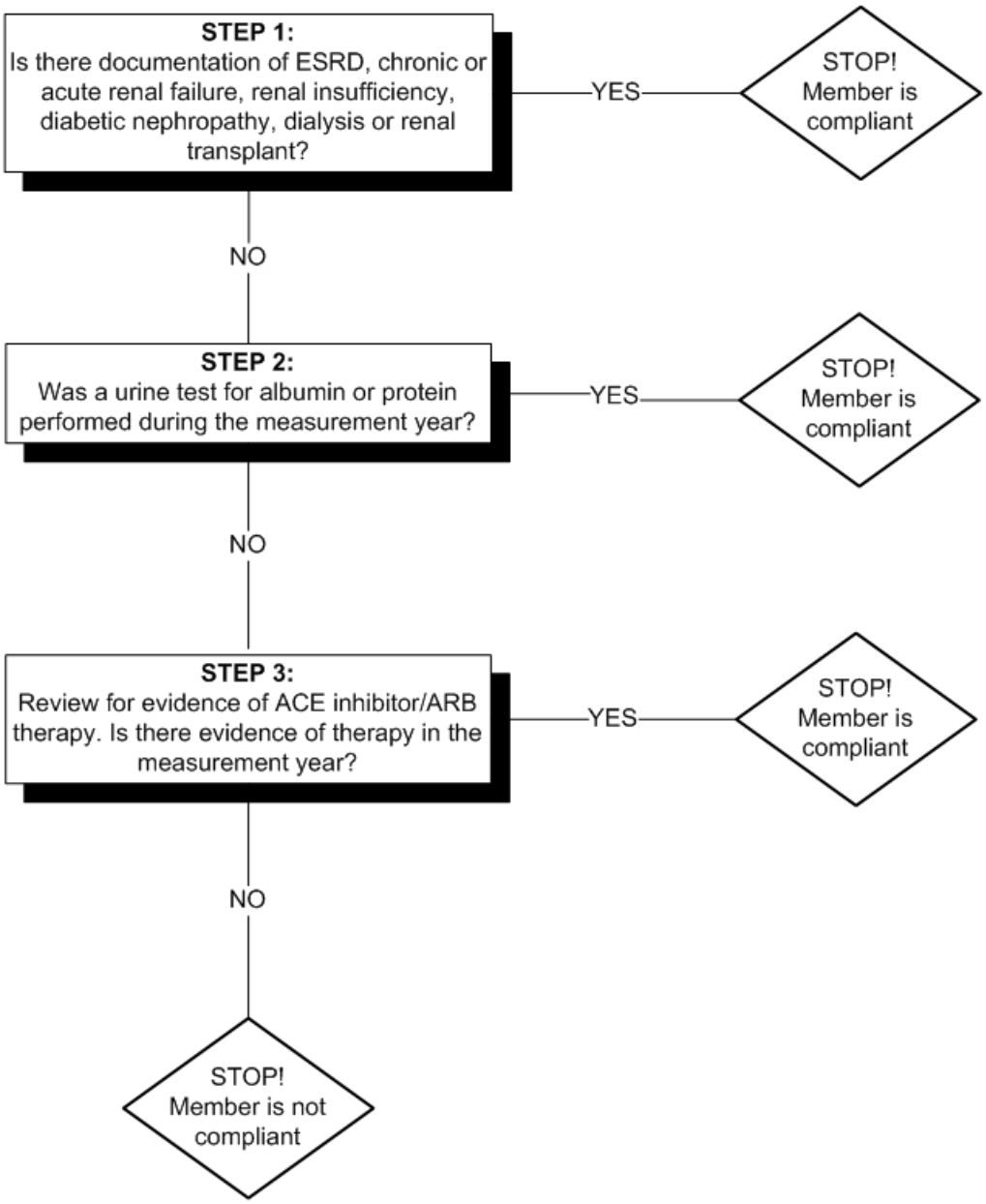
Exclusions *(optional)*

Refer to *Administrative Specification* for exclusion criteria. Identify members who did not have a diagnosis of diabetes, in any setting, during the measurement year or the year prior to the measurement year, ***and*** who had a diagnosis of gestational diabetes or steroid-induced diabetes, in any setting, during the measurement year or the year prior to the measurement year.

Note

- *Organizations may select a data collection method (Administrative vs. Hybrid) at the indicator level, but the method used for HbA1c testing and control rates must be consistent.*
- *Blindness is not an exclusion for a diabetic eye exam because it is difficult to distinguish between individuals who are legally blind but require a retinal exam and those who are completely blind and therefore do not require an exam.*
- *To facilitate HEDIS reporting the denominator for all rates (with the exception of the HbA1c Control (<7.0%) for a Selected Population must be the same. While an eye exam is not possible, services measured in the other indicators are important for members with bilateral eye enucleation. For these reasons bilateral eye enucleation is considered a numerator hit (rather than an optional exclusion).*
- *Hypertensive retinopathy is not handled differently from diabetic retinopathy when reporting the Eye Exam indicator; for example, an eye exam documented as positive for hypertensive retinopathy is counted as positive for diabetic retinopathy and an eye exam documented as negative for hypertensive retinopathy is counted as negative for diabetic retinopathy. The intent of the Eye Exam indicator is to ensure that members with evidence of any type of retinopathy have an eye exam annually, while members who remain free of retinopathy (i.e., the retinal exam was negative for retinopathy) are screened every other year.*
- *If a combination of administrative, supplemental or hybrid data are used, the most recent result must be used, regardless of data source, for the indicators that require use of the most recent result.*
- *If an organization chooses to apply the optional exclusions, members must be numerator negative for at least one indicator, with the exception of HbA1c Poor Control (>9%). Remove members from the eligible population who are numerator negative for any indicator (other than for HbA1c Poor Control [>9%]) and substitute members from the oversample. Do not exclude members who are numerator compliant for all indicators except HbA1c Poor Control (>9%), because a lower rate indicates better performance for this indicator.*
- *When excluding BP readings from the BP Control <140/90 mm Hg indicator, the intent is to identify diagnostic or therapeutic procedures that require a medication regimen, a change in diet or a change in medication. For example (this list is just for reference, and is not exhaustive):*
  - *A colonoscopy requires a change in diet (NPO on the day of procedure) and a medication change (a medication is taken to prep the colon).*
  - *Dialysis, infusions and chemotherapy (including oral chemotherapy) are all therapeutic procedures that require a medication regimen.*
  - *A nebulizer treatment with albuterol is considered a therapeutic procedure that requires a medication regimen (the albuterol).*
  - *A patient forgetting to take regular medications on the day of the procedure is not considered a required change in medication, and therefore the BP reading is eligible.*
- *BP readings taken on the same day that the patient receives a common low-intensity or preventive procedure are eligible for use. For example, the following procedures are considered common low-intensity or preventive procedures (this list is just for reference, and is not exhaustive):*
  - *Vaccinations.*
  - *Injections (e.g., allergy, vitamin B-12, insulin, steroid, toradol, Depo-Provera, testosterone, lidocaine).*
  - *TB test.*
  - *IUD insertion.*
  - *Eye exam with dilating agents.*
  - *Wart or mole removal.*

Monitoring for Nephropathy



Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table CDC-1/2/3: Data Elements for Comprehensive Diabetes Care

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	*Each of the 7 rates*	*Each of the 7 rates*
Eligible population with required exclusions applied	*Each of the 7 rates*	*Each of the 7 rates*
Number of numerator events by administrative data in eligible population (before optional exclusions)		*Each of the 7 rates*
Current year's administrative rate (before optional exclusions)		*Each of the 7 rates*
Minimum required sample size (MRSS)		*Each of the 7 rates*
Oversampling rate		*Each of the 7 rates*
Number of oversample records		*Each of the 7 rates*
Number of numerator events by administrative data in MRSS		*Each of the 7 rates*
Administrative rate on MRSS		*Each of the 7 rates*
Number of medical records excluded because of valid data errors		*Each of the 7 rates*
Number of optional administrative data records excluded		*Each of the 7 rates*
Number of optional medical records excluded		*Each of the 7 rates*
Number of employee/dependent medical records excluded		*Each of the 7 rates*
Number of HbA1c <7 required medical records excluded		*HbA1c <7 Rate*
Number of HbA1c <7 required administrative data records excluded		*HbA1c <7 Rate*
Records added from the oversample list		*Each of the 7 rates*
Denominator		*Each of the 7 rates*
Numerator events by administrative data	*Each of the 7 rates*	*Each of the 7 rates*
Numerator events by medical records		*Each of the 7 rates*
Numerator events by supplemental data	*Each of the 7 rates*	*Each of the 7 rates*
Reported rate	*Each of the 7 rates*	*Each of the 7 rates*

Table CDC-3-B: Data Elements for Comprehensive Diabetes Care: Eye Exam (Medicare SES Stratifications only. Report the Total Medicare population in Table CDC-1/2/3)

	Administrative	Hybrid
Eligible population	*Each of the 6 stratifications*	*Each of the 6 stratifications*
Denominator		*Each of the 6 stratifications*
Numerator events by administrative data	*Each of the 6 stratifications*	*Each of the 6 stratifications*
Numerator events by medical records		*Each of the 6 stratifications*
Numerator events by supplemental data	*Each of the 6 stratifications*	*Each of the 6 stratifications*
Reported rate	*Each of the 6 stratifications*	*Each of the 6 stratifications*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Comprehensive Diabetes Care

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age as of June 30"). Changing denominator age range is allowed within specified age range (ages 18–75 years). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Only events or diagnoses that contain (or map to) codes in the medication lists and value sets may be used to identify visits. Medication lists, value sets and logic may not be changed
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied; value sets and logic may not be changed.
Required Exclusions	No	The age exclusion for the HbA1c <7.0% indicator must be applied.
Exclusions: I-SNP, LTI, Frailty or Advanced Illness	Yes	These exclusions are not required. Refer to *Exclusions* in the *Guidelines for the Rules for Allowable Adjustments*.

Numerator Criteria	Adjustments Allowed (Yes/No)	Notes
• Hemoglobin A1c (HbA1c) testing • HbA1c poor control (>9.0%) • HbA1c control (<8.0%) • HbA1c control (<7.0%) for a selected population • Eye exam (retinal) performed • Medical attention for nephropathy • BP control (<140/90 mm HG)	No	Medication lists, value sets and logic may not be changed.

Concurrent Use of Opioids and Benzodiazepines

This measure examines the percentage of individuals 18 years and older with concurrent use of prescription opioids and benzodiazepines.

The denominator includes individuals 18 years and older by the first day of the measurement year with 2 or more prescription claims for opioids filled on 2 or more separate days, for which the sum of the days supply is 15 or more days during the measurement period. Patients in hospice care and those with a cancer diagnosis are excluded.

The numerator includes individuals from the denominator with 2 or more prescription claims for benzodiazepines filled on 2 or more separate days, and concurrent use of opioids and benzodiazepines for 30 or more cumulative days.

Opioids	See Table COB-A: Opioids
Benzodiazepines	See Table COB-B: Benzodiazepines
Concurrent Use	Overlapping supply for an opioid and a benzodiazepine for 30 or more cumulative days.
Measurement Year	The time period when the measure is assessed, generally the calendar year.

The purpose of quality measurement is to improve quality of care, inform consumers and influence payment. At this time, the goal is to develop measure concepts that are indicative of potential improvements in or to our healthcare system so that evidence-based patient care can be provided and positive patient outcomes can be achieved, while considering costs, and ultimately, patient safety.

Since 1999, the amount of prescription opioids sold in the U.S. nearly quadrupled, as did deaths from prescription opioids.[1] Prescription opioid-related deaths are now considered to be one of the leading preventable public health problems.[2] In 2010, the US government released its first National Drug Control Strategy, stating that overdoses from opioids is a “growing national crisis”.[3] In 2010, opioids were associated with the most pharmaceutical-related overdose deaths (75.2%), followed by benzodiazepines (29.4%).[4] In addition, benzodiazepines use was associated with 30.1% of opioid overdose deaths and opioid use was associated with 77.2% of benzodiazepine overdose deaths. Concurrent use of opioids and benzodiazepines, both central nervous system (CNS) depressants, increases the risk for severe respiratory depression, which can be fatal. These adverse events can occur in patients that do not exhibit signs of drug abuse.

Several studies suggest that concurrent use of opioids and benzodiazepines might put patients at greater risk for potentially fatal overdose. Three studies of fatal opioid overdose deaths found evidence of concurrent benzodiazepine use in 31%–61% of decedents.[5–7] In one study, the rates of nonmedical use-related emergency department visits and overdose deaths involving both opioid analgesics and benzodiazepines approximately tripled from 2004 to 2011, and benzodiazepines were involved in 31% of opioid overdose deaths in 2011.[7] Benzodiazepines were determined to be involved in 61% of opioid-related deaths in 2010 among North Carolina residents receiving prescription opioids.[6] Furthermore, benzodiazepines are increasingly involved in opioid overdose deaths. The number of opioid overdose deaths involving benzodiazepines increased 14% on average each year from 2006 through 2011, while the number of opioid analgesic overdose deaths not involving benzodiazepines did not change significantly.[8] Lastly, a case-cohort study found that concurrent use of benzodiazepines among US veterans using opioids raised the risk of drug overdose deaths four-fold (hazard ratio = 3.86, 95% confidence interval = 3.49-4.26) compared with patients not using benzodiazepines.[9] See Appendix A for an evidence table of evaluated studies.

Despite the risks described above, concurrent prescriptions for opioids and benzodiazepines is common and increasing.[10,11] In one study, approximately half of the patients received both the opioid and benzodiazepine prescriptions from the same prescriber on the same day.[10] In an analysis from 2015 in the non-cancer or non-hospice enrolled Medicare Part D opioid user population, the prevalence of opioid and benzodiazepine concurrent use (any day with overlapping supply) was 24%.[11]

According to the *Centers for Disease Control and Prevention (CDC) Guideline for Prescribing Opioids for Chronic Pain – United States, 2016*, clinicians should avoid prescribing opioid pain medications and benzodiazepines whenever possible.[12] This is a Category A recommendation (applies to all persons; most patients should receive the recommended course of action) and is based on Type 3 evidence (observational studies or randomized clinical trials with notable limitations). In August 2016, the US Food and Drug Administration added concurrent use of opioids and benzodiazepines as a boxed warning to labeling of prescription opioid pain and prescription opioid cough medicines, and benzodiazepines.[13] The Centers for Medicare and Medicaid Services (CMS) is also concerned with both the high prevalence of concurrent opioids and benzodiazepines therapy, as well as instances of very long durations of use. In the 2017 Final Call Letter,[14] CMS discussed these concerns and encouraged Part D sponsors to evaluate their claims data and use available drug utilization management tools to help address the concurrent use of these drug classes. Starting in October 2016, CMS added a concurrent opioid-benzodiazepine use flag to the OMS reports in an effort to assist Part D sponsors in addressing this issue.[15]

This measure was designed for monitoring and improving quality of care across populations of patients. Patients with cancers diagnoses and those receiving hospice care are excluded from the measure because of the unique therapeutic goals, ethical considerations, opportunities for medical supervision, and balance of risks and benefits with opioid therapy in such care.[12] Concurrent use of opioids and benzodiazepines has an unfavorable balance of benefit and harm for most individuals.
Although there are circumstances when it might be appropriate to prescribe opioids to a patient receiving benzodiazepines (e.g., severe acute pain in a patient taking long-term, stable low-dose benzodiazepine therapy), clinicians should avoid prescribing opioids and benzodiazepines concurrently whenever possible. The CDC guideline cautions against abrupt withdrawal from benzodiazepines, which can be associated with hallucinations, seizures, and in rare cases, death; the guideline also provides specific strategies to improve safety while tapering opioids or benzodiazepines.[12]

References Available Upon Request

Ages	18 years and older as of the first day of the measurement year.
Benefit	Pharmacy.
Treatment Period	The individual's treatment period begins on the date of the first prescription claim of any target medication (Tables COB-A: Opioids and COB-B: Benzodiazepines) and extends through whichever occurs first: the last day of the measurement year, death, or disenrollment.
Continuous Enrollment …using enrollment data	Individuals should be continuously enrolled during the treatment period.
Allowable Gap for Medicaid	No more than one gap in continuous enrollment of up to 45 days during the treatment period. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the enrollee may not have more than a 1-month gap in coverage (i.e., an enrollee whose coverage lapses for 2 months [60 consecutive days] is not considered continuously enrolled).

Data Sources	Medical claims, Pharmacy claims, Prescription Drug Hierarchical Condition Categories (RxHCCs)
Denominator	The number of individuals from the eligible population with 2 or more prescription claims for any opioid (see Table COB-A: Opioids) filled on 2 or more separate days, for which the sum of the days supply is 15 or more days during the measurement period.

Numerator

The number of individuals from the denominator with:

- 2 or more prescription claims for any benzodiazepine (Table COB-B: Benzodiazepines) filled on 2 or more separate days, AND
- Concurrent use of opioids and benzodiazepines for 30 or more cumulative days.

Concurrent use is identified using the dates of service and days supply of an individual's opioid and benzodiazepine prescription drug claims. The days of concurrent use is the sum of the number of days during the treatment period with overlapping days supply for an opioid and a benzodiazepine.

Exclusion

Hospice: Any patient with a hospice indicator from the enrollment database during the measurement year is excluded from the denominator.

Cancer diagnosis: Any patient with a cancer diagnosis during the measurement year is excluded from the denominator.

Commercial, Medicaid, or Medicare data (if available):

- ICD-9 or ICD-10 codes, based on the American Medical Association-convened Physician Consortium for Performance Improvement Cancer value set (OID: 2.16.840.1.113883.3.526.3.1010).
  Available at: https://vsac.nlm.nih.gov/
  See ICD-9 and/or ICD-10 diagnosis codes in the excel file, *ICD Codes Measure Manual*, tab COB- *Table Cancer Exclusion*
- A cancer diagnosis is defined as having at least one claim with any of the listed cancer diagnoses, including primary diagnosis or any other diagnosis fields during the measurement year.

Medicare Data (if ICD codes not available)

- RxHCCs 8, 9, 10, 11 for Payment Year 2015; or
  RxHCCs 15, 16, 17, 18, 19 for Payment Year 2016
  Available at: https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors.html)

Stratification

Commercial, Medicaid, Medicare (report each product line separately).

Low-income subsidy (LIS) population (report rates for LIS population and non-LIS population separately.

Medication Tables

Table COB-A: Opioids [a]

buprenorphine [b]	hydromorphone	oxycodone
butorphanol	levorphanol	oxymorphone
codeine	meperidine	pentazocine
dihydrocodeine	methadone	tapentadol
fentanyl [c]	morphine	tramadol
hydrocodone	opium	

[a] Excludes injectable formulations.
[b] Excludes single-agent and combination buprenorphine products used to treat opioid use disorder (i.e., buprenorphine sublingual tablets, Probuphine® Implant kit subcutaneous implant, and all buprenorphine/naloxone combination products).
[c] Excludes Ionsys® (fentanyl transdermal patch), as it is only for inpatient use and is only available through a restricted program under a Risk Evaluation and Mitigation Strategy (REMS).

Table COB-B: Benzodiazepines [a]

alprazolam	diazepam	oxazepam
chlordiazepoxide	estazolam	quazepam
clobazam	flurazepam	temazepam
clonazepam	lorazepam	triazolam
clorazepate	midazolam	

[a] Excludes injectable formulations

2018 Condition-Specific Measures Updates and Specifications Report
Hospital-Level 30-Day Risk-Standardized Readmission Measures

Acute Myocardial Infarction – Version 11.0
Chronic Obstructive Pulmonary Disease – Version 7.0
Heart Failure – Version 11.0
Pneumonia – Version 11.0
Stroke – Version 7.0

Submitted By:

Yale New Haven Health Services Corporation – Center for Outcomes Research & Evaluation (YNHHSC/CORE)

Prepared For:

Centers for Medicare & Medicaid Services (CMS)

March 2018

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Acknowledgements

This work is a collaborative effort and the authors gratefully acknowledge the Veterans Health Administration (VHA); Mathematica Policy Research; General Dynamics Information Technology; Customer Value Partners; Sharon-Lise Normand from Harvard Medical School, Department of Health Care Policy and Harvard School of Public Health, Department of Biostatistics; Kanchana Bhat, Jinghong Gao, Lori Geary, and Yongfei Wang from CORE; Taybah for Healthcare Consulting, Inc.; and Lein Han and Pierre Yong at CMS for their contributions to this work.

1. HOW TO USE THIS REPORT

This report describes the Centers for Medicare & Medicaid Services' (CMS's) condition-specific readmission measures used in the Hospital Inpatient Quality Reporting program and publicly reported on Hospital Compare. The measures report hospital-level 30-day risk-standardized readmission rates (RSRRs) following acute myocardial infarction (AMI), chronic obstructive pulmonary disease (COPD), heart failure (HF), pneumonia, and stroke admissions. This report serves as a single source of information about these measures for a wide range of readers. Reports describing other outcome measures can be found on *QualityNet*.

This report provides an overview of the measure methodology, methodology updates for 2018 public reporting, and the national results for 2018 public reporting. The appendices provide detailed specifications for each measure, including tables of codes used for cohort derivation and risk adjustment, as well as a history of annual updates.

Specifically, the report includes:

- **Section 2 - An overview of the AMI, COPD, HF, pneumonia, and stroke readmission measures:**
  - Background
  - Cohort inclusions and exclusions
    - Included and excluded hospitalizations
    - How transferred patients are handled
  - Unplanned readmission outcome
  - Risk-adjustment variables
  - Data sources
  - Readmission rate calculation
  - Categorization of hospitals' performance score

- **Section 3 - 2018 measure updates**

- **Section 4 - 2018 measure results**

- **Section 5 - Glossary**

The appendices contain detailed measure information, consisting of:

- Appendix A: Statistical approach to calculating RSRRs;
- Appendix B: Data quality assurance (QA);
- Appendix C: Annual updates to the measures since measure development;
- Appendix D: Measure specifications, including hyperlinks to certain ICD-10 code lists that are posted in the supplemental Excel file on *QualityNet*; and,
- Appendix E: Detailed overview of the planned readmission algorithm, including hyperlinks to ICD-10 code lists that are posted in the supplemental Excel file on *QualityNet*.

The original measure methodology reports and prior updates and specifications reports are available in the 'Measure Methodology' and 'Archived Resources' sections under the claims-based readmission measures page on *QualityNet*.[1-11]

The AMI, HF, and pneumonia readmission measure methodologies are also described in the peer-reviewed medical literature.[7,12-14]

For resources on quality improvement activities aimed at reducing readmission in general, and for more information about the cost and business case for making such improvements, refer to the 'Reducing Readmissions' section under the claims-based readmission measures page on *QualityNet*.

2. BACKGROUND AND OVERVIEW OF MEASURE METHODOLOGY

2.1. Background on Readmission Measures

In July 2009, CMS began publicly reporting 30-day RSRRs for AMI, HF, and pneumonia for the nation's non-federal short-term acute care hospitals (including Indian Health Services hospitals) and critical access hospitals. In 2011, CMS and the VHA collaborated to update the readmission measures to include AMI, HF, and pneumonia admissions in Veterans Administration (VA) hospitals. VA data were not included in the 2016 and 2017 results, but were reinstituted for 2018 public reporting.

In 2014, CMS began publicly reporting two additional hospital 30-day readmission measures: COPD and ischemic stroke. These two measures also include admissions to non-federal short-term acute care hospitals (including Indian Health Services hospitals) and critical access hospitals. However, the COPD and stroke measures do not include admissions to VA hospitals.

Results for all five of these readmission measures are posted and updated annually on Hospital Compare.

CMS contracted with the YNHHSC/CORE to update the AMI, COPD, HF, pneumonia, and stroke readmission measures for 2018 public reporting through a process of measure reevaluation.

2.2. Overview of Measure Methodology

The 2018 risk-adjusted readmission measures use specifications from the initial measure methodology reports with refinements to the measures, as listed in Appendix C and described in the prior measures updates and specifications reports.[1-10,15-20] An overview of the methodology is presented in this section.

The measure methodology used in the Hospital Inpatient Quality Reporting program that is described in this report is the same methodology that will be used to calculate excess readmissions for the AMI, COPD, HF, and pneumonia measures included in the Hospital Readmissions Reduction Program (HRRP); however, the hospitals included in the two programs differ slightly. More information about the HRRP can be found on *QualityNet's* Hospital Readmissions Reduction Program webpage and in the fiscal year (FY) 2013 – 2018 Inpatient Prospective Payment System (IPPS) Final Rules on the CMS website.

2.2.1 Cohort

Index Admissions Included in the Measures

An index admission is the hospitalization to which the readmission outcome is attributed and includes admissions for patients:

- Having a principal discharge diagnosis of AMI, COPD, HF, pneumonia, or ischemic stroke for each respective measure;

    - The COPD measure cohort also includes admissions with a principal discharge diagnosis of acute respiratory failure and secondary diagnosis of COPD with exacerbation.
    - The pneumonia measure cohort also includes admissions with a principal discharge diagnosis of sepsis (not including severe sepsis) that have a secondary discharge diagnosis of pneumonia coded as present on admission (POA) and no secondary diagnosis of severe sepsis coded as POA.
- Enrolled in Medicare Fee-For-Service (FFS) Part A and Part B for the 12 months prior to the date of the admission and Part A during the index admission, or those who are VA beneficiaries (in the cases of the AMI, HF, and pneumonia measures);
- Aged 65 or over;
- Discharged alive from a non-federal short-term acute care hospital (or VA hospital, in the cases of the AMI, HF, and pneumonia measures); and,
- Not transferred to another acute care facility.

VA beneficiaries are eligible for inclusion in the AMI, HF, and pneumonia measure cohorts regardless of Medicare FFS enrollment or whether they were hospitalized in a VA or non-VA short-term acute care hospital.

The International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) codes used to define the cohort inclusions for each measure for discharges on or after October 1, 2015 are listed in Appendix D, in Table D.1.1, Table D.2.1, Table D.3.1, Table D.4.1, and Table D.5.1 for AMI, COPD, HF, pneumonia, and stroke, respectively. The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) code lists for discharges prior to October 1, 2015 can be found in the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Index Admissions Excluded from the Measures

The readmission measures exclude index admissions for patients:

- Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries); or,
- Discharged against medical advice.

Note that patients who do not have a full 30 days of post-discharge enrollment in Medicare FFS due to death are eligible for inclusion in the cohorts; this does not represent a change from the original measure methodology. Thus, if a patient had an unplanned readmission and later died, all within 30 days of discharge from the index admission, the case would be captured in the outcome, assuming they met inclusion/exclusion criteria.

An additional exclusion criterion for the AMI cohort is that patients admitted and discharged from a hospital on the same calendar day are excluded as index admissions because it is unlikely that these patients had clinically significant AMIs.

An additional exclusion criterion for the HF cohort is that patients with a procedure code for left ventricular assist device (LVAD) implantation or heart transplantation either during the index admission or in the 12 months prior to the index admission are excluded as index admissions because these patients represent a clinically distinct group. The International Classification of Diseases, 10th Revision, Procedure Coding System (ICD-10-PCS) codes used to identify LVAD and heart transplant procedures in claims for discharges on or after October 1, 2015 are posted on *QualityNet*. The ICD-9 code lists for discharges prior to October 1, 2015 can be found in the 2016 condition-specific readmission measures updates and specifications report also posted on *QualityNet*.

Admissions for a condition within 30 days of discharge from an index admission for that same condition are excluded as index admissions. Thus, no hospitalization will be considered as both a readmission and an index admission within the same measure. However, because the cohorts for the readmission measures are determined independently of each other, a readmission in one measure may qualify as an index admission in other CMS readmission measures.

As a part of data processing prior to the measure calculation, records are removed for non-short-term acute care facilities, such as psychiatric facilities, rehabilitation facilities, or long-term care hospitals. Additional data cleaning steps include removing claims with stays longer than one year, claims with overlapping dates, claims for patients not listed in the Medicare enrollment database, and records with invalid provider IDs.

The percentage of admissions excluded based on each criterion is shown in Section 4 in Figure 4.2.1, Figure 4.3.1, Figure 4.4.1, Figure 4.5.1, and Figure 4.6.1 for AMI, COPD, HF, pneumonia, and stroke, respectively.

Patients Transferred between Hospitals

The measures consider multiple hospitalizations that result from hospital-to-hospital transfers as a single acute episode of care. Transfer patients are identified by tracking claims for inpatient short-term acute care hospitalizations over time. To qualify as a transfer, the second inpatient admission must occur on the same day or the next calendar day following discharge from the first inpatient admission at a different short-term acute care hospital. Cases that meet this criterion are considered transfers regardless of whether the first institution indicates intent to transfer the patient in the discharge disposition code or whether the second inpatient admission is for the same condition.

To include an admission in the measure cohort, the patient must ultimately be discharged to a non-acute care setting (for example, to home or a skilled nursing facility). Thus, for patients transferred from one short-term acute care hospital to another, only the last admission in the series of transfers is eligible for inclusion in the cohort. The previous admissions are not included. For example, if a patient is admitted to Hospital A, transferred to Hospital B, and then discharged from Hospital B to a non-acute care setting, only the Hospital B admission would be included in the cohort, and

an unplanned readmission within 30 days of discharge from the Hospital B admission would be captured in Hospital B's readmission outcome.

2.2.2 Outcome

All-Cause Unplanned Readmissions

The measures are designed to capture unplanned readmissions that arise from acute clinical events requiring urgent rehospitalization within 30 days of discharge. Only an unplanned inpatient admission to a short-term acute care hospital can qualify as a readmission. Planned readmissions, which are generally not a signal of quality of care, are not considered readmissions in the measure outcome. For more detail about how planned readmissions are defined, refer to Section 2.2.3 and Appendix E.

All unplanned readmissions are considered an outcome, regardless of cause. There are a number of reasons for assessing unplanned readmissions for all causes in the CMS readmission measures. First, from a patient perspective, an unplanned readmission for any cause is an adverse event. In addition, making inferences about quality of care based solely on the documented cause of readmission is difficult. For example, a patient with HF who develops a hospital-acquired infection may ultimately be readmitted for sepsis. In this context, considering the readmission to be unrelated to the care that the patient received for HF during the index admission would be inappropriate.

Note that if a patient is readmitted to the **same** hospital on the **same** calendar day of discharge for the **same condition** as the index admission, the measure considers the patient to have had one single continuous admission (that is, one index admission). However, if the condition is **different** from the index admission, this is considered a readmission in the measure.

30-Day Time Frame

The measures assess unplanned readmissions within a 30-day period from the date of discharge from an index admission. The measures use a 30-day time frame because older adult patients are more vulnerable to adverse health outcomes during this time.[21] Readmission occurring within 30 days of discharge can be influenced by hospital care and the early transition to the non-acute care setting. The 30-day time frame is a clinically meaningful period for hospitals to collaborate with their communities in an effort to reduce readmissions.[22]

In determining whether an unplanned readmission occurred within 30 days of discharge from the index admission, the measures use the claim "FROM" date, which is the date the subsequent admission episode started (that is, the date the patient first received care at that hospital within three days of the admission). Thus, in the case where (a) a patient began an unplanned readmission with an emergency department visit, observation stay, or care received in another outpatient location within the same facility (for example, outpatient diagnostic imaging), (b) the patient was admitted as an inpatient to that hospital within three days of that outpatient encounter, and (c) the

care was combined into one claim, the date the outpatient care started would be used for the 30-day time frame.

Multiple Readmissions

If a patient has more than one unplanned admission within 30 days of discharge from the index admission, only the first is considered a readmission. The measures assess a dichotomous yes or no outcome of whether each admitted patient has any unplanned readmission within 30 days. If the first readmission after discharge is planned, any subsequent unplanned readmission is not considered in the outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.

2.2.3 Planned Readmission Algorithm (Version 4.0 2018 [ICD-10])

The planned readmission algorithm is a set of criteria for classifying readmissions as planned among the general Medicare population using Medicare administrative claims data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital.

The planned readmission algorithm has three fundamental principles:

1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/immunotherapy, rehabilitation);
2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and,
3. Admissions for acute illness or for complications of care are never planned.

The algorithm was developed in 2011 as part of the Hospital-wide Readmission measure. In 2013, CMS applied the algorithm to its other readmission measures. The planned readmission algorithm replaced the definition of planned readmissions in the original AMI measure because the algorithm uses a more comprehensive definition. In applying the algorithm to the condition-specific measures, teams of clinical and measure experts reviewed the algorithm to confirm it was appropriate for each measure's cohort.

The planned readmission algorithm uses a flowchart and four tables of specific procedure categories, discharge diagnosis categories, and singular ICD-10 codes to classify readmissions as planned (Appendix E). As illustrated in Figure PR.1, readmissions are considered planned if any of the following occurs during readmission:

1. A procedure is performed that is in one of the procedure categories that are always planned regardless of diagnosis (Table PR.1);
2. The principal diagnosis is in one of the diagnosis categories that are always planned (Table PR.2); or,
3. A procedure is performed that is one of the potentially planned procedures (Table PR.3) and the principal diagnosis is not in the list of acute discharge diagnoses (Table PR.4).

Note that the ICD-10-based Agency for Healthcare Research and Quality (AHRQ) Clinical Classification Software (CCS) categories listed in Tables PR.1 through PR.4 are used to identify planned readmissions in claims for discharges on or after October 1, 2015. Similarly, the singular ICD-10 codes described in Tables PR.3 and PR.4 (and listed in the supplemental Excel file on *QualityNet*) are used to identify planned readmissions in claims for discharges on or after October 1, 2015. The ICD-9-based AHRQ CCS diagnosis and procedure category lists and singular ICD-9 code lists for discharges prior to October 1, 2015 can be found in the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

2.2.4 Risk-Adjustment Variables

In order to account for differences in case mix among hospitals, the measures adjust for variables (for example, age, comorbid diseases, and indicators of patient frailty) that are clinically relevant and have relationships with the outcome. For each patient, risk-adjustment variables are obtained from inpatient, outpatient, and physician Medicare administrative claims data extending 12 months prior to the index admission, and all claims data for the index admission itself. The risk-adjustment variables for the AMI, HF, and pneumonia measures are also obtained from VA administrative data for VA beneficiaries.

The measures adjust for case mix differences among hospitals based on the clinical status of the patient at the time of the index admission. Accordingly, only comorbidities that convey information about the patient at the time of the index admission, or any time within the preceding 12 months, are included in risk adjustment. Complications that arise during the course of the hospitalization are not used in risk adjustment.

The measures do not adjust for socioeconomic status (SES) because the association between SES and health outcomes can be due, in part, to differences in the quality of health care that groups of patients with varying SES receive. The intent is for the measures to adjust for patient demographic and clinical characteristics while illuminating important quality differences. The AMI, COPD, HF, and pneumonia measures were recently re-endorsed by the National Quality Forum (NQF) without adjustment for patient-level SES factors. For more information about this decision, please refer to the NQF website.

Refer to Table D.1.2, Table D.2.2, Table D.3.2, Table D.4.2, and Table D.5.2 in Appendix D of this report for the list of comorbidity risk-adjustment variables and the list of potential complications that are excluded from risk adjustment if they occur only during the index admission, for AMI, COPD, HF, pneumonia, and stroke, respectively. The Condition Categories (CCs) outlined in these tables are used to identify risk variables in claims for discharges on or after October 1, 2015 as well as discharges prior to October 1, 2015. The ICD-10 code lists referenced in the tables that are used to identify certain risk variables (for example, history of percutaneous transluminal coronary angioplasty [PTCA]) in discharges on or after October 1, 2015 are posted on *QualityNet*. For a list of ICD-9 codes used to identify these variables in discharges prior to October 1, 2015,

please refer to the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Note that CC mappings to ICD-10-CM codes (for discharges on or after October 1, 2015) and ICD-9-CM codes (for discharges prior to October 1, 2015) are available on the *QualityNet* website.

2.2.5 Data Sources

The data sources for these analyses are Medicare administrative claims for all measures; VA administrative data for the AMI, HF, and pneumonia measures; and enrollment information for patients with hospitalizations between July 1, 2014 and June 30, 2017. The datasets also contain associated inpatient, outpatient, and physician Medicare administrative claims for the 12 months prior to the index admission and one month subsequent to the index admission for patients admitted in this time period. Refer to the original methodology reports for further descriptions of these data sources and an explanation of the three-year measurement period.[4,7-10]

2.2.6 Measure Calculation

The measures estimate hospital-level 30-day all-cause RSRRs for each condition using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for the variance in patient outcomes within and between hospitals.[23] At the patient level, it models the log-odds of hospital readmission within 30 days of discharge using age, selected clinical covariates, and a hospital-specific effect. At the hospital level, the approach models the hospital-specific effects as arising from a normal distribution. The hospital effect represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific effects are given a distribution to account for the clustering (non-independence) of patients within the same hospital.[23] If there were no differences among hospitals, then after adjusting for patient risk, the hospital effects should be identical across all hospitals.

The RSRR is calculated as the ratio of the number of "predicted" readmissions to the number of "expected" readmissions at a given hospital, multiplied by the national observed readmission rate. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted based on the hospital's performance with its observed case mix, and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows a particular hospital's performance, given its case mix, to be compared to an average hospital's performance with the same case mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, while a higher ratio indicates higher-than-expected readmission rates or worse quality.

The "predicted" number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors (Table D.1.2, Table D.2.2, Table

D.3.2, Table D.4.2, and Table D.5.2 for the AMI, COPD, HF, pneumonia, and stroke measures, respectively) and the hospital-specific effect on the risk of readmission. The estimated hospital-specific effect is added to the sum of the estimated regression coefficients multiplied by the patient characteristics. The results are log transformed and summed over all patients attributed to a hospital to calculate a predicted value. The "expected" number of readmissions (the denominator) is obtained in the same manner, except that a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are log transformed and summed over all patients attributed to a hospital to calculate an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the years of data in that period.

Multiplying the predicted over expected ratio by the national observed readmission rate transforms the ratio into a rate that can be compared to the national observed readmission rate. The hierarchical logistic regression models are described fully in Appendix A and in the original methodology reports.[4,7-10]

2.2.7 Categorizing Hospital Performance

To categorize hospital performance, CMS estimates each hospital's RSRR and the corresponding 95% interval estimate. CMS assigns hospitals to a performance category by comparing each hospital's RSRR interval estimate to the national observed readmission rate. Comparative performance for hospitals with 25 or more eligible cases is classified as follows:

- "No Different than the National Rate" if the 95% interval estimate surrounding the hospital's rate includes the national observed readmission rate.
- "Worse than the National Rate" if the entire 95% interval estimate surrounding the hospital's rate is higher than the national observed readmission rate.
- "Better than the National Rate" if the entire 95% interval estimate surrounding the hospital's rate is lower than the national observed readmission rate.

If a hospital has fewer than 25 eligible cases for a measure, CMS assigns the hospital to a separate category, "Number of Cases Too Small". This category is used when the number of cases is too small (fewer than 25) to reliably conclude how the hospital is performing. If a hospital has fewer than 25 eligible cases, the hospital's readmission rate and interval estimates will not be publicly reported for the measure.

Section 4 describes the distribution of hospitals by performance category in the U.S. for this reporting period.

3. UPDATES TO MEASURES FOR 2018 PUBLIC REPORTING

3.1. Rationale for Measure Updates

Annual measure reevaluation ensures that the risk-standardized readmission models are continually assessed and remain valid, given possible changes in clinical practice and coding standards over time. Modifications made to measure cohorts, risk models, and outcomes are informed by review of the most recent literature related to measure conditions or outcomes, feedback from various stakeholders, and empirical analyses, including assessment of coding trends that reveal shifts in clinical practice or billing patterns. As this report describes, for 2018 public reporting, we made the following modifications to the measures:

- Updated the ICD-10 code-based specifications used in the measures. Specifically:
  - Incorporated the code changes that occurred in the FY 2017 version of the ICD-10-CM/PCS (effective with October 1, 2016+ discharges) into the cohort definitions, planned readmission algorithm, and risk models;
  - Applied the 2017.1 and 2017.2 versions of the AHRQ CCS to the planned readmission algorithm for diagnoses and procedures, respectively;
  - Applied the FY 2017 version of the V22 CMS-Hierarchical Condition Categories (HCC) crosswalk maintained by RTI International to the risk models; and,
  - Conducted code surveillance to identify any specification changes warranted due to coding practices and patterns. Additionally, our clinical and measure experts reviewed the pre-existing ICD-10 code-based specifications to confirm the appropriateness of the specifications unaffected by the updates.

As a part of annual reevaluation, we also undertook the following activities:

- Evaluated and validated model performance for the three years combined (July 2014-June 2017);
- Evaluated the stability of the risk-adjustment models over the three-year measurement period by examining the model variable frequencies, model coefficients, and the performance of the risk-adjustment model in each year (July 2014-June 2015, July 2015-June 2016, and July 2016-June 2017); and,
- Updated the measures' SAS analytic packages (SAS packs) and documentation.

3.2. Detailed Discussion of Measure Updates

3.2.1 Updates to ICD-10 Code-Based Measure Specifications

<u>Cohort Definitions</u>

We studied the FY 2017 version of the ICD-10-CM/PCS, with particular attention to newly added codes and codes that were removed. We then solicited input from clinical and measure experts to determine which, if any, of the newly implemented ICD-10 codes in the 2017 code set should be added to the cohort definitions. These processes led to the following change:

- The addition of ICD-10-CM codes to the stroke cohort inclusion list.

Planned Readmission Algorithm

We studied the 2017.1 and 2017.2 versions of the AHRQ CCS for diagnoses and procedures, respectively, to determine how the newly implemented ICD-10 codes in the 2017 code set were categorized, and to examine any code shifts that may have occurred from the previous version of the AHRQ CCS to the most recent AHRQ CCS. Review of these versions of the AHRQ CCS was extensive, and included:

- Examination of approximately 2,000 ICD-10-CM codes in 73 AHRQ CCS diagnosis categories and over 1,200 ICD-10-PCS codes in 15 AHRQ CCS procedure categories to determine how the newly implemented ICD-10 codes should be incorporated into the planned readmission algorithm specifications; and,
- Examination of 38 ICD-10-CM codes that shifted between AHRQ CCS diagnosis categories and over 1,300 ICD-10-PCS codes that shifted between AHRQ CCS procedure categories to investigate where code shifts may affect the planned readmission algorithm.

We then solicited input from clinical and measure experts to confirm the clinical appropriateness of the AHRQ CCS categorization of the newly implemented ICD-10 codes and any changes warranted due to the code shifts that occurred. The experts also reviewed the newly implemented ICD-10 codes in the FY 2017 version of the ICD-10-CM/PCS to determine which, if any, should be added to the singular ICD-10 code lists that are also used in the algorithm (conditions that are not captured by AHRQ CCS categories). The intent was to maintain the clinical integrity of the algorithm.

These processes led to the following changes in the algorithm:

- Potentially planned procedures (Table PR.3): The addition of ICD-10-PCS codes that capture certain kidney/ureter release procedures, male perineum procedures, and hip/femur internal fixation device removal procedures.
- Acute diagnoses (Table PR.4):
  - The addition of ICD-10-CM codes that capture certain intestinal atherosclerosis, artery dissection, pancreatitis, enterocolitis, and nonmalignant breast conditions, as well as lung abscess without pneumonia and select male and female genital disorders; and,
  - The removal of five AHRQ CCS diagnosis categories as whole categories (AHRQ CCS 225, 228, 230, 232, and 237); the subset of ICD-10-CM initial encounter codes that fell under these categories was retained as acute diagnoses.

Note that AHRQ publishes periodic updates to the CCS to ICD-10 code mappings. For our annual reporting, we utilize the most recent mapping available at the time of measure calculation. For 2018 public reporting, 2017.1 and 2017.2 versions of the AHRQ CCS were used for diagnoses and procedures, respectively.

Risk Adjustment

The process of updating the risk models was similar to the planned readmission algorithm process described above. We studied the FY 2017 version of the V22 CMS-HCC crosswalk maintained by RTI International, to determine how the newly implemented ICD-10 codes in the 2017 code set were classified, and to examine any code shifts that may have occurred from the previous version of the HCC to the most current version. We then solicited input from clinical and measure experts to confirm the clinical appropriateness of the HCC classifications of the newly implemented ICD-10 codes and any changes warranted due to the code shifts that occurred. The experts also reviewed the newly implemented ICD-10 codes in the FY 2017 version of the ICD-10-CM/PCS to determine which, if any, should be added to the singular ICD-10 code lists that are also used in risk adjustment (conditions that are not captured by CC codes). These processes led to the following change:

- The addition of CABG surgery complication ICD-10-CM codes and new ICD-10-PCS codes to the code list used to define the 'History of coronary artery bypass graft (CABG) surgery' risk variable (used in the AMI, HF, and pneumonia readmission measures).

Additional Notes

The goal of these specification updates was to maintain the intent of the measures.

All changes made to the ICD-10 code-based specifications are detailed in the supplemental Excel file that accompanies this report on *QualityNet*. Changes are effective in claims for discharges on or after October 1, 2015.

Note that ICD-10 code listings in this report and the supplemental Excel file reflect the current (2017) labels or narrative descriptions for each code. Changes in the labels are not noted.

3.3. Changes to SAS Packs

We revised the measure calculation SAS packs to accommodate the ICD-10 code-based specification updates as well as the updates to the HCC and AHRQ CCS mappings. The new SAS packs and documentation are available upon request by emailing cmsreadmissionmeasures@yale.edu. **Do *NOT* submit patient-identifiable information (for example, date of birth, Social Security number, health insurance claim number) to this address.**

The SAS packs describe the data files and data elements that feed the model software. Please be aware that CMS does not provide training or technical support for the software. CMS has made the SAS packs available to be completely transparent regarding the measure calculation methodology. However, note that even with the SAS packs, it is not possible to replicate the RSRR calculation without the data files which contain longitudinal patient data from the entire national sample of acute care hospitals to estimate the individual hospital-specific effects, the average hospital-specific effect, and the risk-adjustment coefficients used in the equations.

4. RESULTS FOR 2018 PUBLIC REPORTING

4.1. Assessment of Updated Models

The readmission measures estimate hospital-specific 30-day all-cause RSRRs using hierarchical logistic regression models. Refer to Section 2 for a summary of the measure methodology and model risk-adjustment variables. Refer to prior methodology and technical reports for further details.[1-10,15-20]

We evaluated the performance of the models using the July 2014 to June 2017 data for the 2018 reporting period. We examined the differences in the frequencies of patient risk factors and the model variable coefficients.

For each of the five conditions, we assessed logistic regression model performance in terms of discriminant ability for each year of data and for the three-year combined period. We computed two summary statistics to assess model performance: the predictive ability and the area under the receiver operating characteristic (ROC) curve (c-statistic). We also computed between-hospital variance for each year of data and for the three-year combined period. If there were no systematic differences between hospitals, the between-hospital variance would be zero.

The results of these analyses for each of the five measures (AMI, COPD, HF, pneumonia, and stroke) are presented in Section 4.2, Section 4.3, Section 4.4, Section 4.5, and Section 4.6, respectively.

4.2. AMI Readmission 2018 Model Results

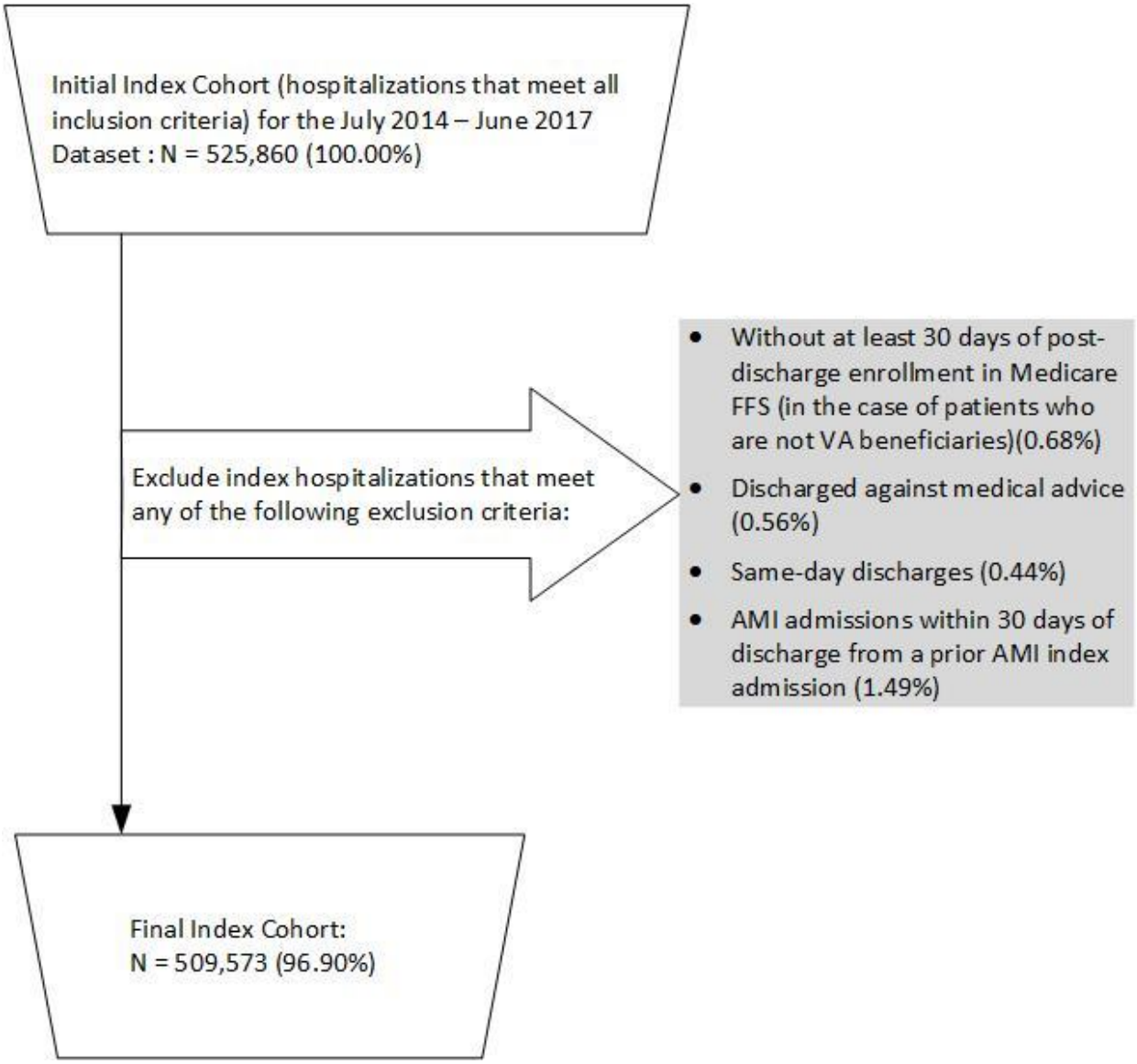
4.2.1 Index Cohort Exclusions

The exclusion criteria for this measure are presented in Section 2.2.1. The percentage of AMI admissions that met each exclusion criterion in the July 2014-June 2017 dataset is presented in Figure 4.2.1.

Admissions may have been counted in more than one exclusion category because they are not mutually exclusive. The index cohort includes short-term acute care hospitalizations for patients:

- Aged 65 or over;
- With a principal discharge diagnosis of AMI;
- Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission, or those who are VA beneficiaries;
- Who were not transferred to another acute care facility; and,
- Were alive at discharge.

Figure 4.2.1 – AMI Cohort Exclusions in the July 2014-June 2017 Dataset



4.2.2 Frequency of AMI Model Variables

We examined the change in the frequencies of clinical and demographic variables. Frequencies of model variables were quite stable over the measurement period. The largest changes in the frequencies (those greater than 2% absolute change) include:

- Increases in Non-anterior location of myocardial infarction (10.7% to 13.1%), Angina pectoris (8.9% to 18.2%), Asthma (7.0% to 9.8%), History of coronary artery bypass graft (CABG) surgery (12.3% to 14.5%), and Renal failure (39.6% - 41.7%)
- A decrease in Coronary atherosclerosis/other chronic ischemic heart disease (87.0% to 81.4%)

Refer to Table 4.2.1 for more detail. Note that the increases and decreases in some model variables may reflect not only changes in rates of comorbidities in the Medicare FFS population, but also changes due to ICD-10 code implementation effective with October 1, 2015+ discharges.

4.2.3 AMI Model Parameters and Performance

Table 4.2.2 shows hierarchical logistic regression model variable coefficients by individual year and for the combined three-year dataset. Table 4.2.3 shows the risk-adjusted odds ratios (ORs) and 95% confidence intervals (CIs) for the AMI readmission model by individual year and for the combined three-year dataset. Overall, the variable effect sizes were relatively constant across years. In addition, model performance was stable over the three-year time period; the c-statistic increased slightly from 0.65 to 0.66 (Table 4.2.4).

4.2.4 Distribution of Hospital Volumes and Readmission Rates for AMI

The national observed readmission rate in the combined three-year dataset was 16.0%. Between July 2014-June 2015 and July 2016-June 2017, the observed rate decreased from 16.4% to 15.8%.

Table 4.2.5 shows the distribution of hospital admission volumes, and Table 4.2.6 shows the distribution of hospital RSRRs. The mean RSRR decreased over the three-year period, from 16.4% (between July 2014 and June 2015) to 15.8% (between July 2016 and June 2017). The median hospital RSRR in the combined three-year dataset was 16.0% (interquartile range [IQR]: 15.7% - 16.3%). Table 4.2.7 shows the between-hospital variance by individual year, as well as for the combined three-year dataset. Between-hospital variance in the combined dataset was 0.024 (Standard Error [SE]: 0.002).

Figure 4.2.2 shows the overall distribution of the hospital RSRRs for the combined three-year dataset. The odds of all-cause readmission if a patient is treated at a hospital one SD above the national rate were 1.36 times higher than the odds of all-cause readmission if treated at a hospital one SD below the national rate. If there were no systematic differences between hospitals, the OR would be 1.0.[23]

4.2.5 Distribution of Hospitals by Performance Category in the Three-Year Dataset

Of 4,208 hospitals in the study cohort, 24 performed "Better than the National Rate," 2,174 performed "No Different than the National Rate," and 31 performed "Worse than the National Rate." 1,979 were classified as "Number of Cases Too Small" (fewer than 25) to reliably conclude how the hospital is performing.

Table 4.2.1 – Frequency of AMI Model Variables over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Total N	167,678	169,940	171,955	509,573
Mean age minus 65 (SD)	13.3 (8.4)	13.0 (8.3)	12.9 (8.3)	13.1 (8.3)
Male (%)	54.0	54.4	54.9	54.5
Anterior myocardial infarction	6.6	6.5	6.4	6.5
Non-anterior location of myocardial infarction	10.7	12.8	13.1	12.2
History of coronary artery bypass graft (CABG) surgery	12.3	14.2	14.5	13.7
History of percutaneous transluminal coronary angioplasty (PTCA)	19.8	20.5	20.3	20.2
Severe infection; other infectious diseases (CC 1, 3-7)	26.1	25.7	25.2	25.7
Metastatic cancer and acute leukemia (CC 8)	2.0	2.0	2.2	2.1
Cancer (CC 9-14)	18.8	18.7	18.7	18.7
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	47.8	48.0	47.6	47.8
Protein-calorie malnutrition (CC 21)	6.2	6.2	6.7	6.4
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	27.5	27.5	27.8	27.6
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	47.2	46.6	46.6	46.8
Dementia or other specified brain disorders (CC 51-53)	18.8	18.3	18.4	18.5
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	4.8	5.1	5.8	5.2
Congestive heart failure (CC 85)	30.5	30.4	30.3	30.4
Acute coronary syndrome (CC 86-87)	20.7	21.5	21.9	21.4
Angina pectoris (CC 88)	8.9	14.9	18.2	14.0
Coronary atherosclerosis/other chronic ischemic heart disease (CC 89)	87.0	83.1	81.4	83.8
Valvular and rheumatic heart disease (CC 91)	32.2	32.2	32.1	32.2
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	35.4	35.7	34.8	35.3
Stroke (CC 99-100)	6.9	6.7	6.2	6.6
Cerebrovascular disease (CC 101-102, 105)	21.2	20.3	19.3	20.3
Vascular or circulatory disease (CC 106-109)	35.5	35.8	35.5	35.6
Chronic obstructive pulmonary disease (COPD) (CC 111)	30.1	29.5	29.6	29.7
Asthma (CC 113)	7.0	8.6	9.8	8.5
Pneumonia (CC 114-116)	22.0	20.8	20.3	21.0
Dialysis status (CC 134)	3.5	3.6	3.8	3.7
Renal failure (CC 135-140)	39.6	40.4	41.7	40.6
Other urinary tract disorders (CC 145)	19.4	18.7	17.8	18.6
Decubitus ulcer or chronic skin ulcer (CC 157-161)	7.5	7.4	7.1	7.3

Table 4.2.2 – Hierarchical Logistic Regression Model Variable Coefficients for AMI over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Intercept	-2.483	-2.571	-2.646	-2.572
Age minus 65 (years above 65, continuous)	0.009	0.009	0.010	0.009
Male	-0.073	-0.071	-0.065	-0.074
Anterior myocardial infarction	0.261	0.219	0.250	0.249
Non-anterior location of myocardial infarction	-0.083	-0.062	-0.014	-0.048
History of coronary artery bypass graft (CABG) surgery	0.024	-0.013	0.010	0.004
History of percutaneous transluminal coronary angioplasty (PTCA)	-0.043	0.005	-0.024	-0.018
Severe infection; other infectious diseases (CC 1, 3-7)	0.028	0.025	-0.008	0.014
Metastatic cancer and acute leukemia (CC 8)	0.299	0.200	0.256	0.250
Cancer (CC 9-14)	0.016	0.020	0.025	0.021
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	0.170	0.178	0.181	0.174
Protein-calorie malnutrition (CC 21)	0.150	0.142	0.172	0.153
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	0.129	0.114	0.144	0.130
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	0.250	0.277	0.296	0.274
Dementia or other specified brain disorders (CC 51-53)	-0.021	0.027	0.014	0.004
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	0.087	0.163	0.122	0.123
Congestive heart failure (CC 85)	0.191	0.192	0.164	0.180
Acute coronary syndrome (CC 86-87)	0.006	-0.023	-0.022	-0.014
Angina pectoris (CC 88)	0.010	0.001	0.003	-0.002
Coronary atherosclerosis/other chronic ischemic heart disease (CC 89)	-0.003	0.050	0.092	0.057
Valvular and rheumatic heart disease (CC 91)	0.115	0.150	0.126	0.135
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	0.062	0.075	0.055	0.066
Stroke (CC 99-100)	0.028	-0.004	0.080	0.034
Cerebrovascular disease (CC 101-102, 105)	0.055	0.030	0.010	0.034
Vascular or circulatory disease (CC 106-109)	0.103	0.086	0.121	0.103
Chronic obstructive pulmonary disease (COPD) (CC 111)	0.274	0.269	0.284	0.274
Asthma (CC 113)	-0.009	-0.019	0.021	-0.003
Pneumonia (CC 114-116)	0.179	0.167	0.188	0.178
Dialysis status (CC 134)	0.207	0.228	0.208	0.214
Renal failure (CC 135-140)	0.271	0.249	0.273	0.263
Other urinary tract disorders (CC 145)	0.080	0.072	0.025	0.061
Decubitus ulcer or chronic skin ulcer (CC 157-161)	0.107	0.101	0.091	0.100

Table 4.2.3 – Adjusted OR and 95% CIs for the AMI Hierarchical Logistic Regression Model over Different Time Periods

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Age minus 65 (years above 65, continuous)	1.01 (1.01 - 1.01)	1.01 (1.01 - 1.01)	1.01 (1.01 - 1.01)	1.01 (1.01 - 1.01)

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Male	0.93 (0.90 - 0.96)	0.93 (0.91 - 0.96)	0.94 (0.91 - 0.96)	0.93 (0.91 - 0.94)
Anterior myocardial infarction	1.30 (1.23 - 1.37)	1.24 (1.18 - 1.32)	1.28 (1.21 - 1.36)	1.28 (1.24 - 1.33)
Non-anterior location of myocardial infarction	0.92 (0.88 - 0.97)	0.94 (0.90 - 0.98)	0.99 (0.94 - 1.03)	0.95 (0.93 - 0.98)
History of coronary artery bypass graft (CABG) surgery	1.02 (0.98 - 1.07)	0.99 (0.95 - 1.03)	1.01 (0.97 - 1.05)	1.00 (0.98 - 1.03)
History of percutaneous transluminal coronary angioplasty (PTCA)	0.96 (0.93 - 0.99)	1.01 (0.97 - 1.04)	0.98 (0.94 - 1.01)	0.98 (0.96 - 1.00)
Severe infection; other infectious diseases (CC 1, 3-7)	1.03 (1.00 - 1.06)	1.03 (0.99 - 1.06)	0.99 (0.96 - 1.02)	1.01 (1.00 - 1.03)
Metastatic cancer and acute leukemia (CC 8)	1.35 (1.24 - 1.47)	1.22 (1.12 - 1.33)	1.29 (1.19 - 1.40)	1.28 (1.22 - 1.35)
Cancer (CC 9-14)	1.02 (0.98 - 1.05)	1.02 (0.99 - 1.06)	1.03 (0.99 - 1.06)	1.02 (1.00 - 1.04)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	1.18 (1.15 - 1.22)	1.20 (1.16 - 1.23)	1.20 (1.16 - 1.23)	1.19 (1.17 - 1.21)
Protein-calorie malnutrition (CC 21)	1.16 (1.11 - 1.22)	1.15 (1.10 - 1.21)	1.19 (1.13 - 1.25)	1.16 (1.13 - 1.20)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	1.14 (1.10 - 1.18)	1.12 (1.08 - 1.16)	1.15 (1.12 - 1.19)	1.14 (1.12 - 1.16)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	1.28 (1.25 - 1.32)	1.32 (1.28 - 1.36)	1.34 (1.30 - 1.38)	1.32 (1.29 - 1.34)
Dementia or other specified brain disorders (CC 51-53)	0.98 (0.95 - 1.01)	1.03 (0.99 - 1.06)	1.01 (0.98 - 1.05)	1.00 (0.98 - 1.02)
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	1.09 (1.03 - 1.16)	1.18 (1.11 - 1.24)	1.13 (1.07 - 1.19)	1.13 (1.09 - 1.17)
Congestive heart failure (CC 85)	1.21 (1.17 - 1.25)	1.21 (1.17 - 1.25)	1.18 (1.14 - 1.22)	1.20 (1.17 - 1.22)
Acute coronary syndrome (CC 86-87)	1.01 (0.97 - 1.04)	0.98 (0.94 - 1.01)	0.98 (0.95 - 1.01)	0.99 (0.97 - 1.01)
Angina pectoris (CC 88)	1.01 (0.96 - 1.06)	1.00 (0.96 - 1.04)	1.00 (0.97 - 1.04)	1.00 (0.98 - 1.02)
Coronary atherosclerosis/other chronic ischemic heart disease (CC 89)	1.00 (0.96 - 1.04)	1.05 (1.01 - 1.09)	1.10 (1.06 - 1.14)	1.06 (1.03 - 1.08)
Valvular and rheumatic heart disease (CC 91)	1.12 (1.09 - 1.16)	1.16 (1.13 - 1.20)	1.13 (1.10 - 1.17)	1.14 (1.13 - 1.16)
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	1.06 (1.03 - 1.10)	1.08 (1.05 - 1.11)	1.06 (1.02 - 1.09)	1.07 (1.05 - 1.09)
Stroke (CC 99-100)	1.03 (0.98 - 1.08)	1.00 (0.94 - 1.05)	1.08 (1.03 - 1.14)	1.03 (1.00 - 1.07)
Cerebrovascular disease (CC 101-102, 105)	1.06 (1.02 - 1.09)	1.03 (1.00 - 1.07)	1.01 (0.98 - 1.05)	1.03 (1.01 - 1.06)
Vascular or circulatory disease (CC 106-109)	1.11 (1.08 - 1.14)	1.09 (1.06 - 1.12)	1.13 (1.09 - 1.16)	1.11 (1.09 - 1.13)
Chronic obstructive pulmonary disease (COPD) (CC 111)	1.32 (1.28 - 1.35)	1.31 (1.27 - 1.35)	1.33 (1.29 - 1.37)	1.32 (1.29 - 1.34)

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Asthma (CC 113)	0.99 (0.94 - 1.04)	0.98 (0.94 - 1.03)	1.02 (0.98 - 1.07)	1.00 (0.97 - 1.02)
Pneumonia (CC 114-116)	1.20 (1.16 - 1.24)	1.18 (1.14 - 1.22)	1.21 (1.17 - 1.25)	1.19 (1.17 - 1.22)
Dialysis status (CC 134)	1.23 (1.16 - 1.31)	1.26 (1.18 - 1.34)	1.23 (1.16 - 1.31)	1.24 (1.19 - 1.28)
Renal failure (CC 135-140)	1.31 (1.27 - 1.35)	1.28 (1.24 - 1.32)	1.31 (1.27 - 1.35)	1.30 (1.28 - 1.32)
Other urinary tract disorders (CC 145)	1.08 (1.05 - 1.12)	1.07 (1.04 - 1.11)	1.03 (0.99 - 1.06)	1.06 (1.04 - 1.08)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	1.11 (1.06 - 1.17)	1.11 (1.06 - 1.16)	1.10 (1.04 - 1.15)	1.11 (1.08 - 1.14)

Table 4.2.4 – AMI Generalized Linear Modeling (Logistic Regression) Performance over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Predictive ability, % (lowest decile – highest decile)	5.6 - 30.7	5.3 - 29.5	5.3 - 30.1	5.4 - 30.1
c-statistic	0.65	0.65	0.66	0.65

Table 4.2.5 – Distribution of Hospital AMI Admission Volumes over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	3,784	3,724	3,630	4,208
Mean number of admissions (SD)	44.3 (63.2)	45.6 (65.4)	47.4 (66.3)	121.1 (187.1)
Range (min. – max.)	1 - 568	1 - 620	1 - 547	1 - 1,735
25^{th} percentile	3	3	3	6
50^{th} percentile	16	16	18	31
75^{th} percentile	63	65	68	169

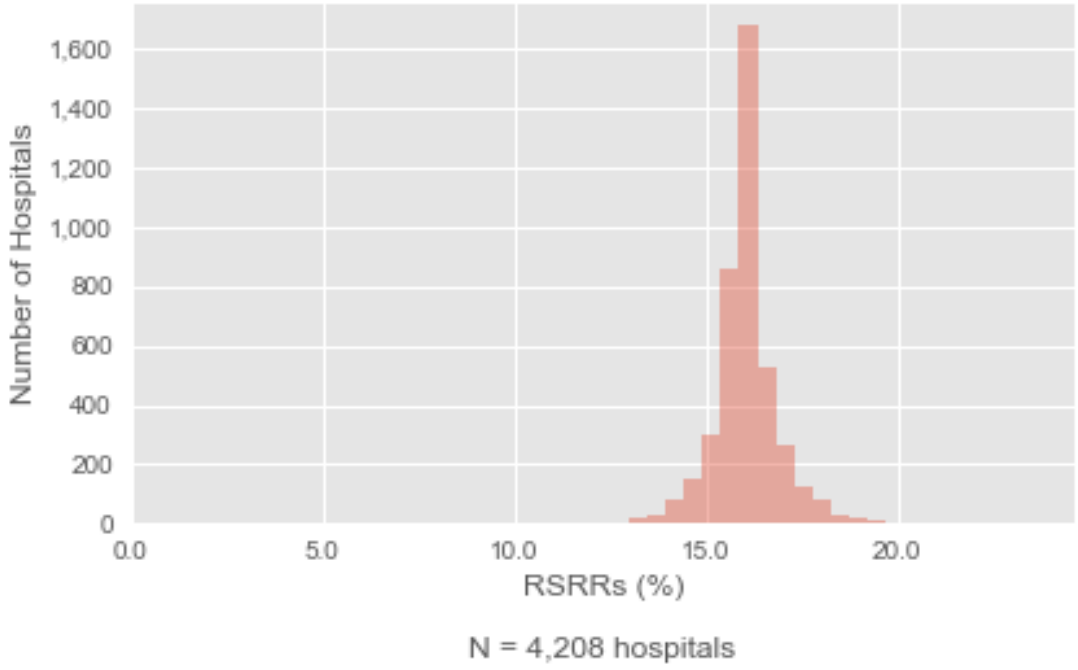
Table 4.2.6 – Distribution of Hospital AMI RSRRs over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	3,784	3,724	3,630	4,208
Mean (SD)	16.4 (0.4)	15.9 (0.6)	15.8 (0.6)	16.1 (0.9)
Range (min. – max.)	13.8 - 18.9	12.7 - 20.6	12.9 - 21.3	12.0 - 24.0
25^{th} percentile	16.2	15.7	15.6	15.7
50^{th} percentile	16.3	15.9	15.8	16.0
75^{th} percentile	16.5	16.1	16.1	16.3

Table 4.2.7 – Between-Hospital Variance for AMI

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Between-hospital variance (SE)	0.015 (0.003)	0.023 (0.004)	0.023 (0.004)	0.024 (0.002)

Figure 4.2.2 – Distribution of Hospital 30-Day AMI RSRRs between July 2014 and June 2017



4.3. COPD Readmission 2018 Model Results

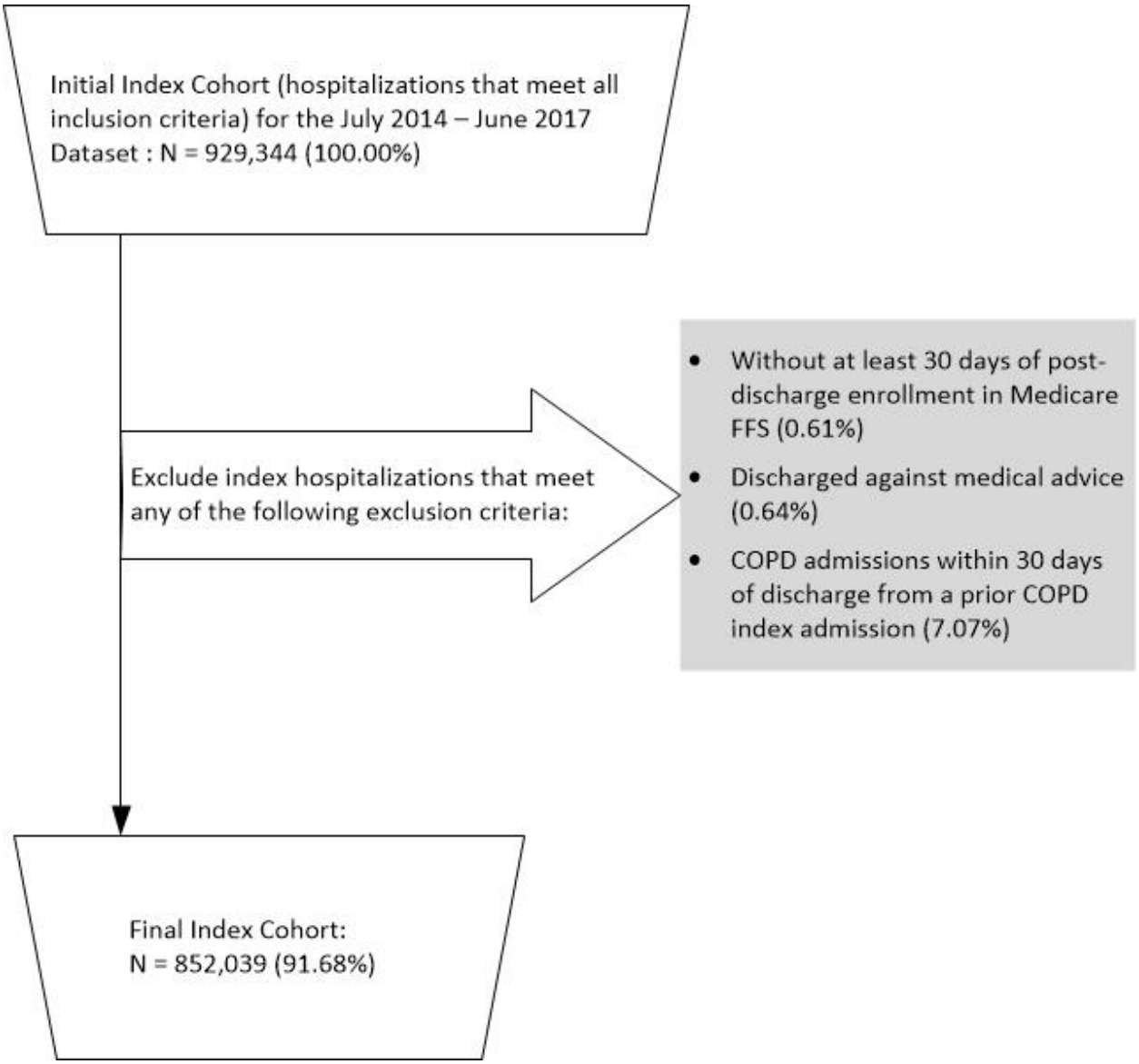
4.3.1 Index Cohort Exclusions

The exclusion criteria for this measure are presented in Section 2.2.1. The percentage of COPD admissions that met each exclusion criterion in the July 2014-June 2017 dataset is presented in Figure 4.3.1.

Admissions may have been counted in more than one exclusion category because they are not mutually exclusive. The index cohort includes short-term acute care hospitalizations for patients:

- Aged 65 or over;
- With a principal discharge diagnosis of COPD or principal discharge diagnosis of acute respiratory failure with a secondary diagnosis of COPD with exacerbation;
- Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission;
- Who were not transferred to another acute care facility; and,
- Were alive at discharge.

Figure 4.3.1 – COPD Cohort Exclusions in the July 2014-June 2017 Dataset



4.3.2 Frequency of COPD Model Variables

We examined the change in the frequencies of clinical and demographic variables. Frequencies of model variables were quite stable over the measurement period. The largest changes in the frequencies (those greater than 2% absolute change) include increases in Anxiety disorders (6.4% to 9.7%), Cardio-respiratory failure and shock (40.3% to 44.8%), Protein-calorie malnutrition (10.6% to 12.9%), Pneumonia (49.3% to 56.1%), and Renal failure (33.9% to 36.8%).

Refer to Table 4.3.1 for more detail. Note that the increases and decreases in some model variables may reflect not only changes in rates of comorbidities in the Medicare FFS population, but also changes due to ICD-10 code implementation effective with October 1, 2015+ discharges.

4.3.3 COPD Model Parameters and Performance

Table 4.3.2 shows hierarchical logistic regression model variable coefficients by individual year and for the combined three-year dataset. Table 4.3.3 shows the risk-adjusted ORs and 95% CIs for the COPD readmission model by individual year and for the combined three-year dataset. Overall, the variable effect sizes were relatively constant across years. In addition, model performance was stable over the three-year time period; the c-statistic increased slightly from 0.63 to 0.64 (Table 4.3.4).

4.3.4 Distribution of Hospital Volumes and Readmission Rates for COPD

The national observed readmission rate in the combined three-year dataset was 19.6%. Between July 2014-June 2015 and July 2016-June 2017, the observed rate decreased from 19.7% to 19.4%.

Table 4.3.5 shows the distribution of hospital admission volumes, and Table 4.3.6 shows the distribution of hospital RSRRs. The mean RSRR decreased from 19.8% (between July 2014 and June 2015) to 19.4% (between July 2016 and June 2017) over the three-year period. The median hospital RSRR in the combined three-year dataset was 19.5% (IQR: 19.1% - 20.1%). Table 4.3.7 shows the between-hospital variance by individual year, as well as for the combined three-year dataset. Between-hospital variance in the combined dataset was 0.017 (SE: 0.001).

Figure 4.3.2 shows the overall distribution of the hospital RSRRs for the combined three-year dataset. The odds of all-cause readmission if a patient is treated at a hospital one SD above the national rate were 1.30 times higher than the odds of all-cause readmission if treated at a hospital one SD below the national rate. If there were no systematic differences between hospitals, the OR would be 1.0.[23]

4.3.5 Distribution of Hospitals by Performance Category in the Three-Year Dataset

Of 4,576 hospitals in the study cohort, 18 performed "Better than the National Rate," 3,627 performed "No Different than the National Rate," and 56 performed "Worse than the National Rate." 875 were classified as "Number of Cases Too Small" (fewer than 25) to reliably conclude how the hospital is performing.

Table 4.3.1 – Frequency of COPD Model Variables over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Total N	287,553	256,114	308,372	852,039
Mean age minus 65 (SD)	11.7 (7.6)	11.5 (7.5)	11.9 (7.7)	11.7 (7.6)
History of mechanical ventilation	11.2	12.1	10.9	11.4
Sleep apnea	20.8	21.9	22.4	21.7
Severe infection; other infectious diseases (CC 1, 3-7)	33.8	34.0	33.9	33.9
Metastatic cancer and acute leukemia (CC 8)	2.6	2.8	3.3	2.9
Lung and other severe cancers (CC 9)	7.0	7.4	8.1	7.5
Lymphatic, head and neck, brain, and other major cancers; breast, colorectal and other cancers and tumors; other respiratory and heart neoplasms (CC 10-13)	13.6	13.5	13.7	13.6
Other digestive and urinary neoplasms (CC 14)	6.6	6.4	6.4	6.5
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	43.1	42.6	41.4	42.3
Protein-calorie malnutrition (CC 21)	10.6	11.5	12.9	11.7
Morbid obesity; other endocrine/metabolic/nutritional disorders (CC 22, 25-26)	82.7	83.0	83.7	83.2
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	39.5	40.9	40.7	40.4
Chronic pancreatitis (CC 34)	0.5	0.5	0.5	0.5
Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	12.9	13.1	13.1	13.1
Other gastrointestinal disorders (CC 38)	66.2	67.0	67.7	67.0
Severe hematological disorders (CC 46)	1.0	1.0	1.1	1.0
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	51.9	51.9	52.2	52.0
Dementia or other specified brain disorders (CC 51-53)	18.2	18.3	19.7	18.8
Drug/alcohol psychosis or dependence (CC 54-55)	5.3	6.1	6.2	5.9
Major psychiatric disorders (CC 57-59)	13.0	12.6	11.8	12.5
Depression (CC 61)	29.2	29.3	28.5	29.0
Anxiety disorders (CC 62)	6.4	8.2	9.7	8.1
Other psychiatric disorders (CC 63)	33.8	35.6	35.5	35.0
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	4.4	4.9	5.7	5.0
Polyneuropathy; other neuropathies (CC 75, 81)	22.8	23.8	24.2	23.6
Respirator dependence/respiratory failure (CC 82-83)	1.3	1.3	1.4	1.3
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	40.3	44.5	44.8	43.2
Congestive heart failure (CC 85)	44.0	44.9	43.9	44.3
Acute coronary syndrome (CC 86-87)	8.7	9.3	9.7	9.3

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Coronary atherosclerosis or angina (CC 88-89)	52.2	51.6	51.5	51.8
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	43.4	43.5	42.0	42.9
Other and unspecified heart disease (CC 98)	20.9	21.0	21.0	21.0
Stroke (CC 99-100)	6.1	5.9	5.6	5.9
Vascular or circulatory disease (CC 106-109)	43.0	43.6	44.1	43.6
Fibrosis of lung or other chronic lung disorders (CC 112)	14.8	14.6	13.9	14.4
Pneumonia (CC 114-116)	49.3	50.0	56.1	52.0
Renal failure (CC 135-140)	33.9	35.3	36.8	35.4
Decubitus ulcer or chronic skin ulcer (CC 157-161)	7.9	8.1	8.4	8.1
Cellulitis, local skin infection (CC 164)	12.9	12.8	12.9	12.9
Vertebral fractures without spinal cord injury (CC 169)	5.2	5.2	4.9	5.1

Table 4.3.2 – Hierarchical Logistic Regression Model Variable Coefficients for COPD over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Intercept	-2.218	-2.263	-2.254	-2.248
Age minus 65 (years above 65, continuous)	0.000	-0.003	-0.002	-0.002
History of mechanical ventilation	0.155	0.182	0.157	0.163
Sleep apnea	-0.011	-0.041	-0.001	-0.015
Severe infection; other infectious diseases (CC 1, 3-7)	0.048	0.084	0.061	0.062
Metastatic cancer and acute leukemia (CC 8)	0.190	0.254	0.235	0.223
Lung and other severe cancers (CC 9)	0.199	0.142	0.166	0.168
Lymphatic, head and neck, brain, and other major cancers; breast, colorectal and other cancers and tumors; other respiratory and heart neoplasms (CC 10-13)	0.018	0.011	0.006	0.013
Other digestive and urinary neoplasms (CC 14)	-0.032	-0.040	-0.068	-0.047
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	0.067	0.075	0.075	0.072
Protein-calorie malnutrition (CC 21)	0.089	0.106	0.136	0.114
Morbid obesity; other endocrine/metabolic/nutritional disorders (CC 22, 25-26)	-0.052	-0.038	-0.053	-0.048
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	0.143	0.149	0.154	0.149
Chronic pancreatitis (CC 34)	0.175	0.124	0.039	0.110
Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	0.072	0.060	0.073	0.068
Other gastrointestinal disorders (CC 38)	0.050	0.061	0.048	0.053
Severe hematological disorders (CC 46)	0.193	0.168	0.119	0.157
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	0.168	0.172	0.177	0.173
Dementia or other specified brain disorders (CC 51-53)	0.007	-0.020	-0.021	-0.013
Drug/alcohol psychosis or dependence (CC 54-55)	0.171	0.168	0.167	0.169
Major psychiatric disorders (CC 57-59)	0.031	0.018	0.043	0.032
Depression (CC 61)	0.003	-0.018	-0.001	-0.003
Anxiety disorders (CC 62)	0.059	0.102	0.073	0.074
Other psychiatric disorders (CC 63)	0.092	0.107	0.101	0.098

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	0.063	0.083	0.071	0.070
Polyneuropathy; other neuropathies (CC 75, 81)	0.057	0.023	0.016	0.032
Respirator dependence/respiratory failure (CC 82-83)	0.040	0.057	-0.021	0.020
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	0.213	0.212	0.238	0.223
Congestive heart failure (CC 85)	0.186	0.192	0.202	0.193
Acute coronary syndrome (CC 86-87)	0.069	0.047	0.073	0.061
Coronary atherosclerosis or angina (CC 88-89)	0.052	0.100	0.085	0.078
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	0.154	0.153	0.143	0.151
Other and unspecified heart disease (CC 98)	0.068	0.067	0.067	0.069
Stroke (CC 99-100)	0.011	0.005	0.001	0.006
Vascular or circulatory disease (CC 106-109)	0.073	0.063	0.065	0.067
Fibrosis of lung or other chronic lung disorders (CC 112)	0.078	0.085	0.077	0.082
Pneumonia (CC 114-116)	0.083	0.090	0.044	0.069
Renal failure (CC 135-140)	0.146	0.152	0.138	0.144
Decubitus ulcer or chronic skin ulcer (CC 157-161)	0.062	0.068	0.097	0.076
Cellulitis, local skin infection (CC 164)	0.068	0.086	0.040	0.063
Vertebral fractures without spinal cord injury (CC 169)	0.146	0.134	0.126	0.137

Table 4.3.3 – Adjusted OR and 95% CIs for the COPD Hierarchical Logistic Regression Model over Different Time Periods

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Age minus 65 (years above 65, continuous)	1.00 (1.00 - 1.00)	1.00 (1.00 - 1.00)	1.00 (1.00 - 1.00)	1.00 (1.00 - 1.00)
History of mechanical ventilation	1.17 (1.13 - 1.20)	1.20 (1.16 - 1.24)	1.17 (1.14 - 1.20)	1.18 (1.16 - 1.20)
Sleep apnea	0.99 (0.97 - 1.01)	0.96 (0.94 - 0.98)	1.00 (0.98 - 1.02)	0.99 (0.97 - 1.00)
Severe infection; other infectious diseases (CC 1, 3-7)	1.05 (1.03 - 1.07)	1.09 (1.06 - 1.11)	1.06 (1.04 - 1.08)	1.06 (1.05 - 1.08)
Metastatic cancer and acute leukemia (CC 8)	1.21 (1.14 - 1.28)	1.29 (1.21 - 1.37)	1.26 (1.20 - 1.33)	1.25 (1.21 - 1.29)
Lung and other severe cancers (CC 9)	1.22 (1.18 - 1.27)	1.15 (1.11 - 1.20)	1.18 (1.14 - 1.22)	1.18 (1.16 - 1.21)
Lymphatic, head and neck, brain, and other major cancers; breast, colorectal and other cancers and tumors; other respiratory and heart neoplasms (CC 10-13)	1.02 (0.99 - 1.05)	1.01 (0.98 - 1.04)	1.01 (0.98 - 1.03)	1.01 (1.00 - 1.03)
Other digestive and urinary neoplasms (CC 14)	0.97 (0.93 - 1.01)	0.96 (0.92 - 1.00)	0.93 (0.90 - 0.97)	0.95 (0.93 - 0.98)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	1.07 (1.05 - 1.09)	1.08 (1.06 - 1.10)	1.08 (1.06 - 1.10)	1.07 (1.06 - 1.09)

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Protein-calorie malnutrition (CC 21)	1.09 (1.06 - 1.13)	1.11 (1.08 - 1.15)	1.15 (1.12 - 1.18)	1.12 (1.10 - 1.14)
Morbid obesity; other endocrine/metabolic/nutritional disorders (CC 22, 25-26)	0.95 (0.92 - 0.98)	0.96 (0.93 - 0.99)	0.95 (0.92 - 0.98)	0.95 (0.94 - 0.97)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	1.15 (1.13 - 1.18)	1.16 (1.13 - 1.19)	1.17 (1.14 - 1.19)	1.16 (1.15 - 1.18)
Chronic pancreatitis (CC 34)	1.19 (1.05 - 1.35)	1.13 (1.00 - 1.28)	1.04 (0.92 - 1.17)	1.12 (1.04 - 1.20)
Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	1.07 (1.05 - 1.10)	1.06 (1.03 - 1.09)	1.08 (1.05 - 1.11)	1.07 (1.05 - 1.09)
Other gastrointestinal disorders (CC 38)	1.05 (1.03 - 1.07)	1.06 (1.04 - 1.09)	1.05 (1.03 - 1.07)	1.05 (1.04 - 1.07)
Severe hematological disorders (CC 46)	1.21 (1.12 - 1.32)	1.18 (1.08 - 1.29)	1.13 (1.04 - 1.22)	1.17 (1.12 - 1.23)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	1.18 (1.16 - 1.21)	1.19 (1.16 - 1.21)	1.19 (1.17 - 1.22)	1.19 (1.17 - 1.20)
Dementia or other specified brain disorders (CC 51-53)	1.01 (0.98 - 1.03)	0.98 (0.95 - 1.01)	0.98 (0.96 - 1.00)	0.99 (0.97 - 1.00)
Drug/alcohol psychosis or dependence (CC 54-55)	1.19 (1.14 - 1.23)	1.18 (1.14 - 1.23)	1.18 (1.14 - 1.22)	1.18 (1.16 - 1.21)
Major psychiatric disorders (CC 57-59)	1.03 (1.00 - 1.06)	1.02 (0.99 - 1.05)	1.04 (1.01 - 1.07)	1.03 (1.01 - 1.05)
Depression (CC 61)	1.00 (0.98 - 1.03)	0.98 (0.96 - 1.01)	1.00 (0.98 - 1.02)	1.00 (0.98 - 1.01)
Anxiety disorders (CC 62)	1.06 (1.02 - 1.10)	1.11 (1.07 - 1.15)	1.08 (1.04 - 1.11)	1.08 (1.06 - 1.10)
Other psychiatric disorders (CC 63)	1.10 (1.07 - 1.12)	1.11 (1.09 - 1.14)	1.11 (1.08 - 1.13)	1.10 (1.09 - 1.12)
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	1.07 (1.02 - 1.11)	1.09 (1.04 - 1.14)	1.07 (1.03 - 1.12)	1.07 (1.05 - 1.10)
Polyneuropathy; other neuropathies (CC 75, 81)	1.06 (1.03 - 1.08)	1.02 (1.00 - 1.05)	1.02 (0.99 - 1.04)	1.03 (1.02 - 1.05)
Respirator dependence/respiratory failure (CC 82-83)	1.04 (0.97 - 1.12)	1.06 (0.98 - 1.14)	0.98 (0.91 - 1.05)	1.02 (0.98 - 1.06)
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	1.24 (1.21 - 1.27)	1.24 (1.21 - 1.27)	1.27 (1.24 - 1.30)	1.25 (1.23 - 1.27)
Congestive heart failure (CC 85)	1.20 (1.18 - 1.23)	1.21 (1.18 - 1.24)	1.22 (1.20 - 1.25)	1.21 (1.20 - 1.23)
Acute coronary syndrome (CC 86-87)	1.07 (1.04 - 1.11)	1.05 (1.01 - 1.08)	1.08 (1.04 - 1.11)	1.06 (1.04 - 1.08)
Coronary atherosclerosis or angina (CC 88-89)	1.05 (1.03 - 1.08)	1.10 (1.08 - 1.13)	1.09 (1.07 - 1.11)	1.08 (1.07 - 1.09)
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	1.17 (1.14 - 1.19)	1.17 (1.14 - 1.19)	1.15 (1.13 - 1.18)	1.16 (1.15 - 1.18)
Other and unspecified heart disease (CC 98)	1.07 (1.05 - 1.10)	1.07 (1.04 - 1.10)	1.07 (1.05 - 1.09)	1.07 (1.06 - 1.09)

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Stroke (CC 99-100)	1.01 (0.97 - 1.05)	1.01 (0.96 - 1.05)	1.00 (0.96 - 1.04)	1.01 (0.98 - 1.03)
Vascular or circulatory disease (CC 106-109)	1.08 (1.05 - 1.10)	1.07 (1.04 - 1.09)	1.07 (1.05 - 1.09)	1.07 (1.06 - 1.08)
Fibrosis of lung or other chronic lung disorders (CC 112)	1.08 (1.05 - 1.11)	1.09 (1.06 - 1.12)	1.08 (1.05 - 1.11)	1.09 (1.07 - 1.10)
Pneumonia (CC 114-116)	1.09 (1.06 - 1.11)	1.09 (1.07 - 1.12)	1.05 (1.02 - 1.07)	1.07 (1.06 - 1.08)
Renal failure (CC 135-140)	1.16 (1.13 - 1.18)	1.16 (1.14 - 1.19)	1.15 (1.12 - 1.17)	1.15 (1.14 - 1.17)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	1.06 (1.03 - 1.10)	1.07 (1.03 - 1.11)	1.10 (1.07 - 1.14)	1.08 (1.06 - 1.10)
Cellulitis, local skin infection (CC 164)	1.07 (1.04 - 1.10)	1.09 (1.06 - 1.12)	1.04 (1.01 - 1.07)	1.07 (1.05 - 1.08)
Vertebral fractures without spinal cord injury (CC 169)	1.16 (1.11 - 1.20)	1.14 (1.10 - 1.19)	1.13 (1.09 - 1.18)	1.15 (1.12 - 1.17)

Table 4.3.4 – COPD Generalized Linear Modeling (Logistic Regression) Performance over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Predictive ability, % (lowest decile – highest decile)	9.7 - 35.4	9.3 - 36.4	9.1 - 35.0	9.5 - 35.6
c-statistic	0.63	0.64	0.64	0.64

Table 4.3.5 – Distribution of Hospital COPD Admission Volumes over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	4,462	4,413	4,401	4,576
Mean number of admissions (SD)	64.4 (73.2)	58.0 (66.1)	70.1 (80.6)	186.2 (216.5)
Range (min. – max.)	1 - 872	1 - 693	1 - 767	1 - 2,254
25th percentile	13	12	13	35
50th percentile	38	35	41	107
75th percentile	93	82	100	267

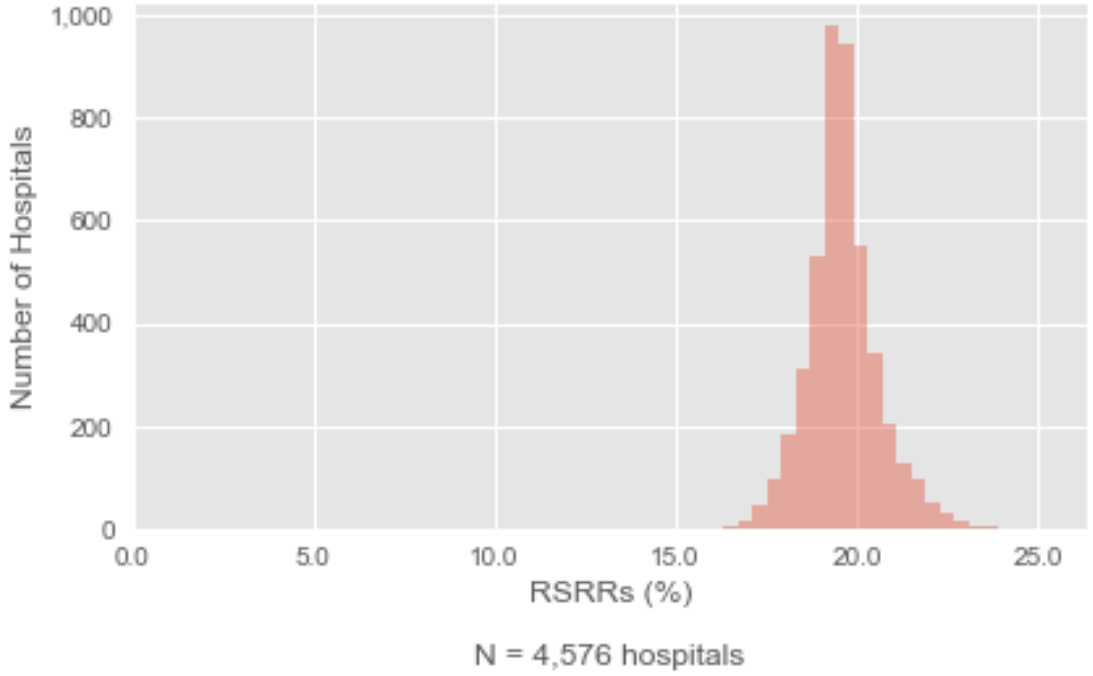
Table 4.3.6 – Distribution of Hospital COPD RSRRs over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	4,462	4,413	4,401	4,576
Mean (SD)	19.8 (0.8)	19.7 (0.8)	19.4 (0.7)	19.6 (1.0)
Range (min. – max.)	17.0 - 23.8	16.3 - 24.9	17.0 - 24.0	15.9 - 25.9
25th percentile	19.3	19.3	19.1	19.1
50th percentile	19.7	19.6	19.3	19.5
75th percentile	20.1	20.1	19.7	20.1

Table 4.3.7 – Between-Hospital Variance for COPD

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Between-hospital variance (SE)	0.018 (0.002)	0.019 (0.002)	0.016 (0.002)	0.017 (0.001)

Figure 4.3.2 – Distribution of Hospital 30-Day COPD RSRRs between July 2014 and June 2017



4.4. HF Readmission 2018 Model Results

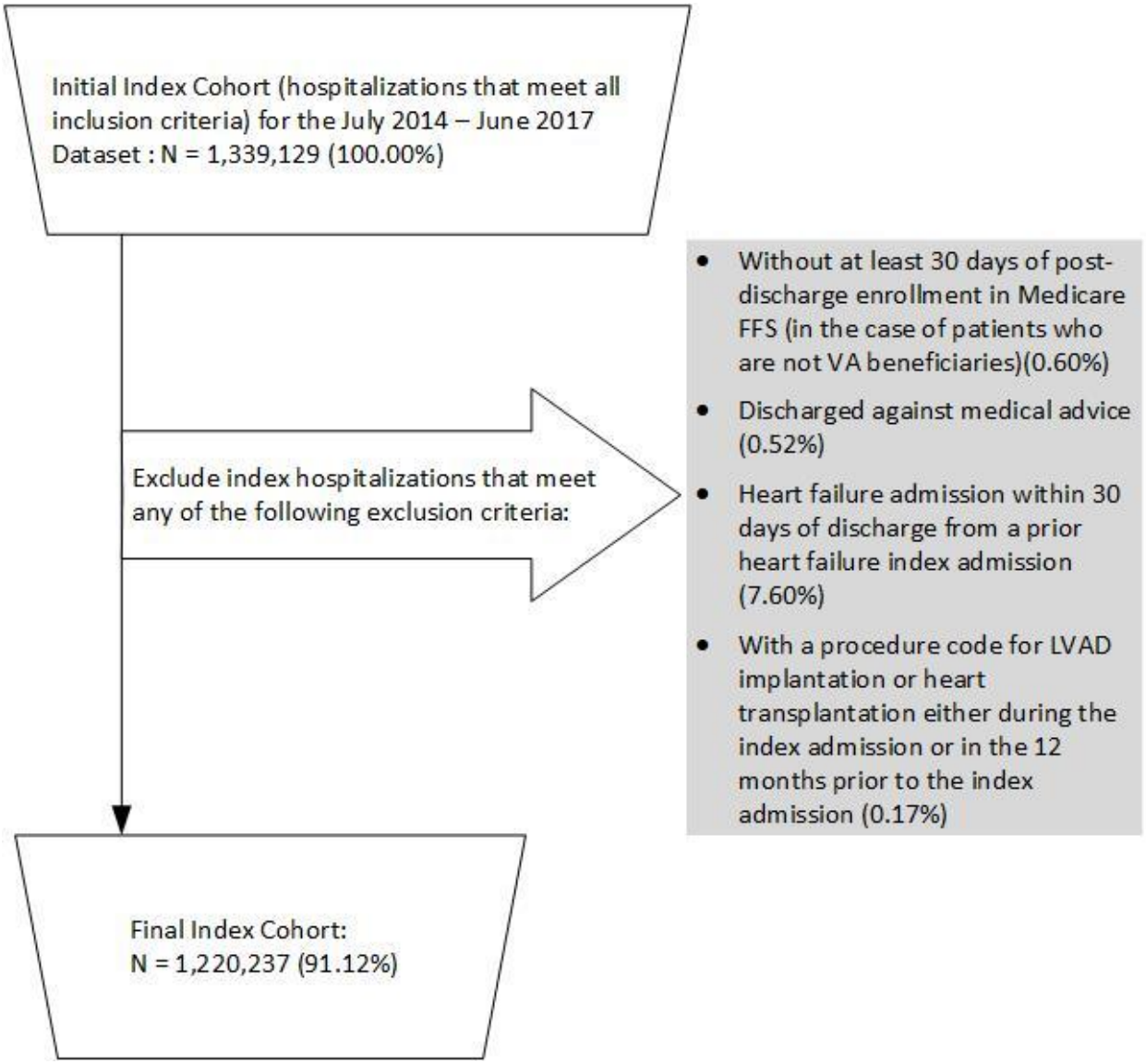
4.4.1 Index Cohort Exclusions

The exclusion criteria for this measure are presented in Section 2.2.1. The percentage of HF admissions that met each exclusion criterion in the July 2014-June 2017 dataset is presented in Figure 4.4.1.

Admissions may have been counted in more than one exclusion category because they are not mutually exclusive. The index cohort includes short-term acute care hospitalizations for patients:

- Aged 65 or over;
- With a principal discharge diagnosis of HF;
- Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission, or those who are VA beneficiaries;
- Who were not transferred to another acute care facility; and,
- Were alive at discharge.

Figure 4.4.1 – HF Cohort Exclusions in the July 2014-June 2017 Dataset



4.4.2 Frequency of HF Model Variables

We examined the change in the frequencies of clinical and demographic variables. Frequencies of model variables were quite stable over the measurement period. The largest changes in the frequencies (those greater than 2% absolute change) include:

- Increases in Asthma (10.1% to 15.0%), Cardio-respiratory failure and shock (30.7% to 34.8%), Nephritis (4.4% to 10.5%), Other psychiatric disorders (21.8% to 24.3%), and Renal failure (63.5% to 67.0%)
- Decreases in Major psychiatric disorders (10.9% to 8.5%), Other urinary tract disorders (29.0% to 26.7%), and Pneumonia (44.9% to 42.7%)

Refer to Table 4.4.1 for more detail. Note that the increases and decreases in some model variables may reflect not only changes in rates of comorbidities in the Medicare FFS population, but also changes due to ICD-10 code implementation effective with October 1, 2015+ discharges.

4.4.3 HF Model Parameters and Performance

Table 4.4.2 shows hierarchical logistic regression model variable coefficients by individual year and for the combined three-year dataset. Table 4.4.3 shows the risk-adjusted ORs and 95% CIs for the HF readmission model by individual year and for the combined three-year dataset. Overall, the variable effect sizes were relatively constant across years. In addition, model performance was stable over the three-year time period; the c-statistic remained constant at 0.61 (Table 4.4.4).

4.4.4 Distribution of Hospital Volumes and Readmission Rates for HF

The national observed readmission rate in the combined three-year dataset was 21.8%. Between July 2014-June 2015 and July 2016-June 2017, the observed rate decreased slightly from 21.9% to 21.8%.

Table 4.4.5 shows the distribution of hospital admission volumes, and Table 4.4.6 shows the distribution of hospital RSRRs. Over the three years, the mean RSRR decreased slightly from 21.9% (between July 2014 and June 2015) to 21.6% (between July 2015 and June 2016) but then increased to 21.8% (between July 2016 and June 2017). The median hospital RSRR in the combined three-year dataset was 21.6% (IQR: 20.9% - 22.5%). Table 4.4.7 shows the between-hospital variance by individual year, as well as for the combined three-year dataset. Between-hospital variance in the combined dataset was 0.025 (SE: 0.001).

Figure 4.4.2 shows the overall distribution of the hospital RSRRs for the combined three-year dataset. The odds of all-cause readmission if a patient is treated at a hospital one SD above the national rate were 1.37 times higher than the odds of all-cause readmission if treated at a hospital one SD below the national rate. If there were no systematic differences between hospitals, the OR would be 1.0.[23]

4.4.5 Distribution of Hospitals by Performance Category in the Three-Year Dataset

Of 4,708 hospitals in the study cohort, 127 performed "Better than the National Rate," 3,520 performed "No Different from the National Rate," and 170 performed "Worse than the National Rate." 891 were classified as "Number of Cases Too Small" (fewer than 25) to reliably conclude how the hospital is performing.

Table 4.4.1 – Frequency of HF Model Variables over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Total N	403,560	398,015	418,662	1,220,237
Mean age minus 65 (SD)	15.8 (8.5)	15.6 (8.5)	15.5 (8.5)	15.6 (8.5)
Male (%)	47.8	48.0	48.0	47.9
History of coronary artery bypass graft (CABG) surgery	19.2	19.4	19.1	19.2
Metastatic cancer and acute leukemia (CC 8)	2.1	2.2	2.4	2.3
Cancer (CC 9-14)	21.0	21.2	21.1	21.1
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	55.1	55.2	54.6	55.0
Protein-calorie malnutrition (CC 21)	9.9	10.3	11.2	10.5
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	49.1	49.6	50.4	49.7
Liver or biliary disease (CC 27-32)	11.4	11.8	12.3	11.8
Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	16.1	16.1	16.2	16.1
Other gastrointestinal disorders (CC 38)	64.6	65.5	66.6	65.6
Severe hematological disorders (CC 46)	2.2	2.2	2.2	2.2
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	63.5	63.4	63.9	63.6
Dementia or other specified brain disorders (CC 51-53)	23.8	23.7	23.9	23.8
Drug/alcohol abuse/dependence/psychosis (CC 54-56)	15.2	15.8	15.8	15.6
Major psychiatric disorders (CC 57-59)	10.9	9.9	8.5	9.8
Depression (CC 61)	22.2	22.3	22.4	22.3
Other psychiatric disorders (CC 63)	21.8	23.0	24.3	23.1
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	6.3	6.8	7.8	7.0
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	30.7	33.0	34.8	32.8
Congestive heart failure (CC 85)	74.8	74.8	74.5	74.7
Acute coronary syndrome (CC 86-87)	16.1	16.8	17.8	16.9
Coronary atherosclerosis or angina (CC 88-89)	72.4	71.8	71.3	71.8
Valvular and rheumatic heart disease (CC 91)	54.0	53.9	54.0	54.0
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	68.6	68.9	68.5	68.7
Other and unspecified heart disease (CC 98)	33.0	33.4	33.9	33.5
Stroke (CC 99-100)	9.0	8.7	8.1	8.6
Vascular or circulatory disease (CC 106-109)	52.7	53.2	53.6	53.2
Chronic obstructive pulmonary disease (COPD) (CC 111)	48.8	48.9	49.2	49.0
Fibrosis of lung or other chronic lung disorders (CC 112)	9.3	9.0	8.5	8.9
Asthma (CC 113)	10.1	12.9	15.0	12.7
Pneumonia (CC 114-116)	44.9	44.0	42.7	43.8
Dialysis status (CC 134)	4.3	4.3	5.0	4.6

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Renal failure (CC 135-140)	63.5	64.9	67.0	65.2
Nephritis (CC 141)	4.4	6.9	10.5	7.3
Other urinary tract disorders (CC 145)	29.0	27.9	26.7	27.9
Decubitus ulcer or chronic skin ulcer (CC 157-161)	14.5	14.5	14.5	14.5

Table 4.4.2 – Hierarchical Logistic Regression Model Variable Coefficients for HF over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Intercept	-2.141	-2.168	-2.152	-2.160
Age minus 65 (years above 65, continuous)	-0.004	-0.004	-0.004	-0.004
Male	0.000	0.018	0.017	0.006
History of coronary artery bypass graft (CABG) surgery	-0.033	0.006	-0.006	-0.008
Metastatic cancer and acute leukemia (CC 8)	0.178	0.160	0.119	0.150
Cancer (CC 9-14)	0.020	0.019	0.030	0.024
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	0.088	0.076	0.069	0.075
Protein-calorie malnutrition (CC 21)	0.097	0.077	0.088	0.087
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	0.117	0.132	0.110	0.120
Liver or biliary disease (CC 27-32)	0.075	0.059	0.092	0.074
Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	0.059	0.045	0.054	0.052
Other gastrointestinal disorders (CC 38)	0.059	0.064	0.047	0.057
Severe hematological disorders (CC 46)	0.159	0.190	0.199	0.183
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	0.127	0.142	0.146	0.139
Dementia or other specified brain disorders (CC 51-53)	0.007	-0.004	-0.008	-0.004
Drug/alcohol abuse/dependence/psychosis (CC 54-56)	0.113	0.084	0.105	0.100
Major psychiatric disorders (CC 57-59)	0.063	0.053	0.035	0.051
Depression (CC 61)	-0.021	0.013	0.012	0.003
Other psychiatric disorders (CC 63)	0.065	0.072	0.066	0.067
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	0.038	0.087	0.080	0.066
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	0.080	0.095	0.117	0.100
Congestive heart failure (CC 85)	0.124	0.119	0.109	0.117
Acute coronary syndrome (CC 86-87)	0.099	0.089	0.092	0.091
Coronary atherosclerosis or angina (CC 88-89)	0.085	0.069	0.055	0.068
Valvular and rheumatic heart disease (CC 91)	0.059	0.050	0.071	0.066
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	0.051	0.045	0.058	0.055
Other and unspecified heart disease (CC 98)	0.023	0.016	0.038	0.030
Stroke (CC 99-100)	0.038	-0.010	-0.014	0.007
Vascular or circulatory disease (CC 106-109)	0.054	0.048	0.044	0.050
Chronic obstructive pulmonary disease (COPD) (CC 111)	0.153	0.147	0.136	0.143
Fibrosis of lung or other chronic lung disorders (CC 112)	0.071	0.057	0.042	0.059

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Asthma (CC 113)	0.019	0.018	0.054	0.030
Pneumonia (CC 114-116)	0.077	0.076	0.074	0.076
Dialysis status (CC 134)	0.101	0.124	0.129	0.117
Renal failure (CC 135-140)	0.221	0.215	0.218	0.217
Nephritis (CC 141)	0.112	0.043	0.039	0.054
Other urinary tract disorders (CC 145)	0.032	0.056	0.049	0.049
Decubitus ulcer or chronic skin ulcer (CC 157-161)	0.085	0.108	0.074	0.090

Table 4.4.3 - Adjusted OR and 95% CIs for the HF Hierarchical Logistic Regression Model over Different Time Periods

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Age minus 65 (years above 65, continuous)	1.00 (1.00 - 1.00)	1.00 (1.00 - 1.00)	1.00 (0.99 - 1.00)	1.00 (1.00 - 1.00)
Male	1.00 (0.98 - 1.02)	1.02 (1.00 - 1.04)	1.02 (1.00 - 1.03)	1.01 (1.00 - 1.02)
History of coronary artery bypass graft (CABG) surgery	0.97 (0.95 - 0.99)	1.01 (0.99 - 1.03)	0.99 (0.97 - 1.01)	0.99 (0.98 - 1.00)
Metastatic cancer and acute leukemia (CC 8)	1.19 (1.13 - 1.26)	1.17 (1.12 - 1.23)	1.13 (1.07 - 1.18)	1.16 (1.13 - 1.20)
Cancer (CC 9-14)	1.02 (1.00 - 1.04)	1.02 (1.00 - 1.04)	1.03 (1.01 - 1.05)	1.02 (1.01 - 1.04)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	1.09 (1.07 - 1.11)	1.08 (1.06 - 1.10)	1.07 (1.05 - 1.09)	1.08 (1.07 - 1.09)
Protein-calorie malnutrition (CC 21)	1.10 (1.08 - 1.13)	1.08 (1.05 - 1.11)	1.09 (1.07 - 1.12)	1.09 (1.08 - 1.11)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	1.12 (1.10 - 1.14)	1.14 (1.12 - 1.16)	1.12 (1.10 - 1.14)	1.13 (1.12 - 1.14)
Liver or biliary disease (CC 27-32)	1.08 (1.05 - 1.10)	1.06 (1.04 - 1.09)	1.10 (1.07 - 1.12)	1.08 (1.06 - 1.09)
Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	1.06 (1.04 - 1.08)	1.05 (1.02 - 1.07)	1.06 (1.03 - 1.08)	1.05 (1.04 - 1.07)
Other gastrointestinal disorders (CC 38)	1.06 (1.04 - 1.08)	1.07 (1.05 - 1.09)	1.05 (1.03 - 1.07)	1.06 (1.05 - 1.07)
Severe hematological disorders (CC 46)	1.17 (1.12 - 1.23)	1.21 (1.15 - 1.27)	1.22 (1.16 - 1.28)	1.20 (1.17 - 1.23)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	1.14 (1.12 - 1.16)	1.15 (1.13 - 1.17)	1.16 (1.14 - 1.18)	1.15 (1.14 - 1.16)
Dementia or other specified brain disorders (CC 51-53)	1.01 (0.99 - 1.03)	1.00 (0.98 - 1.02)	0.99 (0.97 - 1.01)	1.00 (0.99 - 1.01)
Drug/alcohol abuse/dependence/psychosis (CC 54-56)	1.12 (1.10 - 1.14)	1.09 (1.06 - 1.11)	1.11 (1.09 - 1.13)	1.11 (1.09 - 1.12)
Major psychiatric disorders (CC 57-59)	1.06 (1.04 - 1.09)	1.05 (1.03 - 1.08)	1.04 (1.01 - 1.06)	1.05 (1.04 - 1.07)
Depression (CC 61)	0.98 (0.96 - 1.00)	1.01 (0.99 - 1.03)	1.01 (0.99 - 1.03)	1.00 (0.99 - 1.01)

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Other psychiatric disorders (CC 63)	1.07 (1.05 - 1.09)	1.07 (1.05 - 1.10)	1.07 (1.05 - 1.09)	1.07 (1.06 - 1.08)
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	1.04 (1.01 - 1.07)	1.09 (1.06 - 1.12)	1.08 (1.05 - 1.11)	1.07 (1.05 - 1.09)
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	1.08 (1.06 - 1.10)	1.10 (1.08 - 1.12)	1.12 (1.10 - 1.14)	1.10 (1.09 - 1.12)
Congestive heart failure (CC 85)	1.13 (1.11 - 1.16)	1.13 (1.10 - 1.15)	1.12 (1.09 - 1.14)	1.12 (1.11 - 1.14)
Acute coronary syndrome (CC 86-87)	1.10 (1.08 - 1.13)	1.09 (1.07 - 1.12)	1.10 (1.08 - 1.12)	1.10 (1.08 - 1.11)
Coronary atherosclerosis or angina (CC 88-89)	1.09 (1.07 - 1.11)	1.07 (1.05 - 1.09)	1.06 (1.04 - 1.08)	1.07 (1.06 - 1.08)
Valvular and rheumatic heart disease (CC 91)	1.06 (1.04 - 1.08)	1.05 (1.03 - 1.07)	1.07 (1.06 - 1.09)	1.07 (1.06 - 1.08)
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	1.05 (1.03 - 1.07)	1.05 (1.03 - 1.07)	1.06 (1.04 - 1.08)	1.06 (1.04 - 1.07)
Other and unspecified heart disease (CC 98)	1.02 (1.01 - 1.04)	1.02 (1.00 - 1.03)	1.04 (1.02 - 1.06)	1.03 (1.02 - 1.04)
Stroke (CC 99-100)	1.04 (1.01 - 1.07)	0.99 (0.96 - 1.02)	0.99 (0.96 - 1.01)	1.01 (0.99 - 1.02)
Vascular or circulatory disease (CC 106-109)	1.06 (1.04 - 1.07)	1.05 (1.03 - 1.07)	1.05 (1.03 - 1.06)	1.05 (1.04 - 1.06)
Chronic obstructive pulmonary disease (COPD) (CC 111)	1.17 (1.15 - 1.19)	1.16 (1.14 - 1.18)	1.15 (1.13 - 1.16)	1.15 (1.14 - 1.16)
Fibrosis of lung or other chronic lung disorders (CC 112)	1.07 (1.05 - 1.10)	1.06 (1.03 - 1.09)	1.04 (1.02 - 1.07)	1.06 (1.05 - 1.08)
Asthma (CC 113)	1.02 (0.99 - 1.05)	1.02 (0.99 - 1.04)	1.06 (1.03 - 1.08)	1.03 (1.02 - 1.04)
Pneumonia (CC 114-116)	1.08 (1.06 - 1.10)	1.08 (1.06 - 1.10)	1.08 (1.06 - 1.09)	1.08 (1.07 - 1.09)
Dialysis status (CC 134)	1.11 (1.07 - 1.15)	1.13 (1.09 - 1.17)	1.14 (1.10 - 1.18)	1.12 (1.10 - 1.15)
Renal failure (CC 135-140)	1.25 (1.22 - 1.27)	1.24 (1.22 - 1.26)	1.24 (1.22 - 1.27)	1.24 (1.23 - 1.26)
Nephritis (CC 141)	1.12 (1.08 - 1.16)	1.04 (1.01 - 1.08)	1.04 (1.01 - 1.07)	1.06 (1.04 - 1.07)
Other urinary tract disorders (CC 145)	1.03 (1.02 - 1.05)	1.06 (1.04 - 1.08)	1.05 (1.03 - 1.07)	1.05 (1.04 - 1.06)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	1.09 (1.07 - 1.11)	1.11 (1.09 - 1.14)	1.08 (1.05 - 1.10)	1.09 (1.08 - 1.11)

Table 4.4.4 – HF Generalized Linear Modeling (Logistic Regression) Performance over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Predictive ability, % (lowest decile – highest decile)	12.8 - 35.1	12.3 - 35.0	12.8 - 35.2	12.7 - 35.0
c-statistic	0.61	0.61	0.61	0.61

Table 4.4.5 – Distribution of Hospital HF Admission Volumes over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	4,602	4,562	4,536	4,708
Mean number of admissions (SD)	87.7 (109.4)	87.2 (109.4)	92.3 (116.6)	259.2 (331.6)
Range (min. – max.)	1 - 1,317	1 - 1,166	1 - 1,269	1 - 3,752
25th percentile	13	13	13	35
50th percentile	44	42	44	120
75th percentile	126	126	133	373

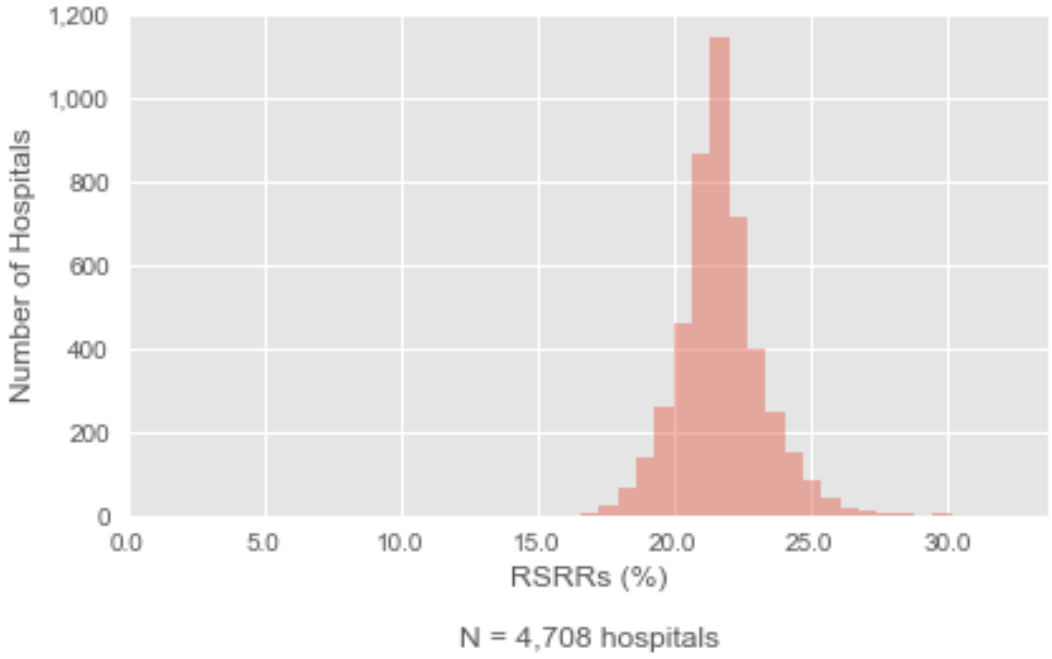
Table 4.4.6 – Distribution of Hospital HF RSRRs over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	4,602	4,562	4,536	4,708
Mean (SD)	21.9 (1.1)	21.6 (1.2)	21.8 (1.2)	21.8 (1.6)
Range (min. – max.)	15.9 - 29.9	17.2 - 28.9	16.8 - 32.1	15.9 - 32.9
25th percentile	21.3	21.0	21.2	20.9
50th percentile	21.8	21.5	21.7	21.6
75th percentile	22.4	22.1	22.3	22.5

Table 4.4.7 – Between-Hospital Variance for HF

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Between-hospital variance (SE)	0.022 (0.002)	0.025 (0.002)	0.025 (0.002)	0.025 (0.001)

Figure 4.4.2 – Distribution of Hospital 30-Day HF RSRRs between July 2014 and June 2017



4.5. Pneumonia Readmission 2018 Model Results

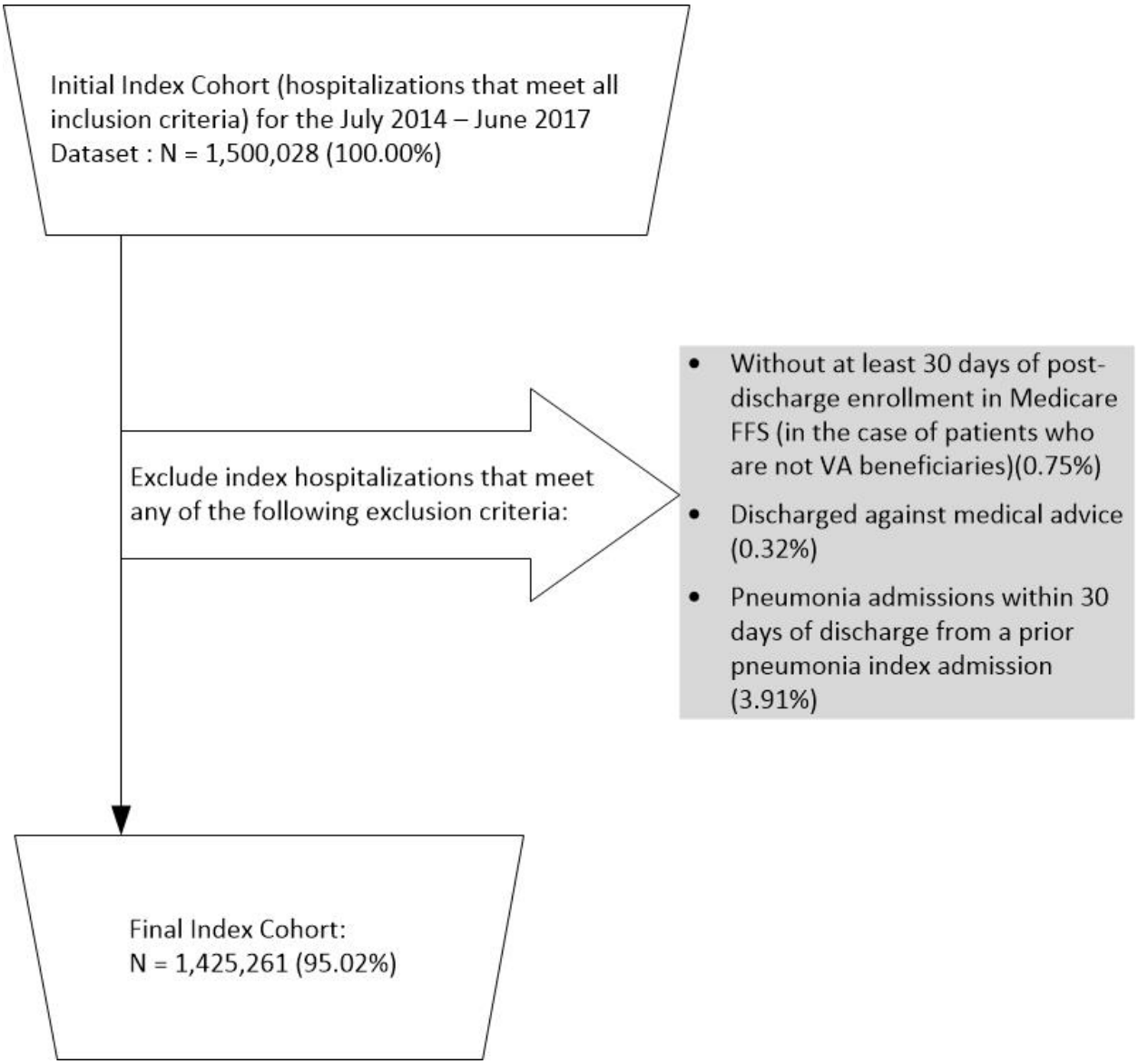
4.5.1 Index Cohort Exclusions

The exclusion criteria for this measure are presented in Section 2.2.1. The percentage of pneumonia admissions that met each exclusion criterion in the July 2014-June 2017 dataset is presented in Figure 4.5.1.

Admissions may have been counted in more than one exclusion category because they are not mutually exclusive. The index cohort includes short-term acute care hospitalizations for patients:

- Aged 65 or over;
- With either a principal discharge diagnosis of pneumonia or a principal discharge diagnosis of sepsis (not including severe sepsis) with a secondary diagnosis of pneumonia coded as POA and no secondary diagnosis of severe sepsis coded as POA;
- Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission, or those who are VA beneficiaries;
- Who were not transferred to another acute care facility; and,
- Were alive at discharge.

Figure 4.5.1 – Pneumonia Cohort Exclusions in the July 2014-June 2017 Dataset



4.5.2 Frequency of Pneumonia Model Variables

We examined the change in the frequencies of clinical and demographic variables. Frequencies of model variables were quite stable over the measurement period. The largest changes in the frequencies (those greater than 2% absolute change) include:

- Increases in Asthma (11.1% to 15.1%), Other psychiatric disorders (24.5% to 26.6%), Renal failure (40.1% to 42.7%), and Septicemia, sepsis, systemic inflammatory response syndrome/shock (14.4% to 16.8%)
- Decreases in Chronic obstructive pulmonary disease (COPD) (51.9% to 45.8%), Major psychiatric disorders (16.0% to 12.8%), and Pneumonia (41.2% to 38.9%)

Refer to Table 4.5.1 for more detail. Note that the increases and decreases in some model variables may reflect not only changes in rates of comorbidities in the Medicare FFS population, but also changes due to ICD-10 code implementation effective with October 1, 2015+ discharges.

4.5.3 Pneumonia Model Parameters and Performance

Table 4.5.2 shows hierarchical logistic regression model variable coefficients by individual year and for the combined three-year dataset. Table 4.5.3 shows the risk-adjusted ORs and 95% CIs for the pneumonia readmission model by individual year and for the combined three-year dataset. Overall, the variable effect sizes were relatively constant across years. In addition, model performance was stable over the three-year time period; the c-statistic increased slightly from 0.63 to 0.64 (Table 4.5.4).

4.5.4 Distribution of Hospital Volumes and Readmission Rates for Pneumonia

The national observed readmission rate in the combined three-year dataset was 16.7%. Between July 2014-June 2015 and July 2016-June 2017, the observed rate decreased from 16.7% to 16.6%.

Table 4.5.5 shows the distribution of hospital admission volumes, and Table 4.5.6 shows the distribution of hospital RSRRs. Over the three years, the RSRRs increased slightly from 16.7% (between July 2014 and June 2015) to 16.9% (between July 2015 and June 2016) but then decreased to 16.6% (between July 2016 and June 2017). The median hospital RSRR in the combined three-year dataset was 16.6% (IQR: 15.9% - 17.5%). Table 4.5.7 shows the between-hospital variance by individual year, as well as for the combined three-year dataset. Between-hospital variance in the combined dataset was 0.025 (SE: 0.001).

Figure 4.5.2 shows the overall distribution of the hospital RSRRs for the combined three-year dataset. The odds of all-cause readmission if a patient is treated at a hospital one SD above the national rate were 1.37 times higher than the odds of all-cause readmission if treated at a hospital one SD below the national rate. If there were no systematic differences between hospitals, the OR would be 1.0.[23]

4.5.5. Distribution of Hospitals by Performance Category in the Three-Year Dataset

Of 4,764 hospitals in the study cohort, 61 performed "Better than the National Rate," 4,054 performed "No Different from the National Rate," and 188 performed "Worse than the National Rate." 461 were classified as "Number of Cases Too Small" (fewer than 25) to reliably conclude how the hospital is performing.

Table 4.5.1 – Frequency of Pneumonia Model Variables over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Total N	508,290	474,631	442,340	1,425,261
Mean age minus 65 (SD)	15.6 (8.6)	15.2 (8.6)	15.5 (8.7)	15.4 (8.6)
Male (%)	48.0	48.4	48.7	48.3
History of coronary artery bypass graft (CABG) surgery	8.7	8.7	8.5	8.6
Severe infection; other infectious diseases (CC 1, 3-7)	40.8	40.9	40.8	40.8
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	14.4	16.1	16.8	15.7
Metastatic cancer and acute leukemia (CC 8)	4.8	5.4	5.6	5.3
Lung and other severe cancers (CC 9)	7.7	8.2	7.9	7.9
Lymphoma; other cancers (CC 10-12)	17.0	17.2	17.1	17.1
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	42.2	42.5	41.9	42.2
Protein-calorie malnutrition (CC 21)	16.5	17.2	18.2	17.3
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	42.5	43.0	43.0	42.8
Other gastrointestinal disorders (CC 38)	68.0	68.8	69.1	68.6
Severe hematological disorders (CC 46)	2.1	2.1	2.1	2.1
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	58.7	58.2	57.5	58.1
Dementia or other specified brain disorders (CC 51-53)	35.8	35.0	36.5	35.7
Drug/alcohol abuse/dependence/psychosis (CC 54-56)	17.0	18.0	16.3	17.1
Major psychiatric disorders (CC 57-59)	16.0	14.6	12.8	14.5
Other psychiatric disorders (CC 63)	24.5	26.1	26.6	25.7
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	8.8	9.5	10.7	9.6
Respirator dependence/tracheostomy status (CC 82)	1.2	1.3	1.4	1.3
Respiratory arrest; cardio-respiratory failure and shock (CC 83-84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 83-84 plus ICD-9-CM diagnosis codes 799.01 and 799.02, for discharges prior to October 1, 2015)	25.8	27.8	27.0	26.8
Congestive heart failure (CC 85)	38.0	38.0	36.7	37.6
Acute coronary syndrome (CC 86-87)	7.5	8.1	8.5	8.0
Coronary atherosclerosis or angina (CC 88-89)	47.8	47.4	46.4	47.2
Valvular and rheumatic heart disease (CC 91)	25.7	26.0	25.9	25.9
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	45.6	45.6	44.2	45.2
Stroke (CC 99-100)	10.4	10.1	9.6	10.1
Vascular or circulatory disease (CC 106-109)	43.7	44.4	44.0	44.0
Chronic obstructive pulmonary disease (COPD) (CC 111)	51.9	52.2	45.8	50.1
Fibrosis of lung or other chronic lung disorders (CC 112)	12.8	12.4	10.9	12.1
Asthma (CC 113)	11.1	14.2	15.1	13.4
Pneumonia (CC 114-116)	41.2	41.2	38.9	40.5

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Pleural effusion/pneumothorax (CC 117)	17.4	18.1	17.3	17.6
Other respiratory disorders (CC 118)	49.0	50.5	49.6	49.7
Dialysis status (CC 134)	3.4	3.5	3.7	3.5
Renal failure (CC 135-140)	40.1	41.5	42.7	41.4
Urinary tract infection (CC 144)	30.3	30.3	30.3	30.3
Other urinary tract disorders (CC 145)	22.3	22.0	21.2	21.9
Decubitus ulcer or chronic skin ulcer (CC 157-161)	13.3	13.2	13.3	13.3
Vertebral fractures without spinal cord injury (CC 169)	5.4	5.3	4.9	5.2
Other injuries (CC 174)	41.4	42.4	42.8	42.2

Table 4.5.2 – Hierarchical Logistic Regression Model Variable Coefficients for Pneumonia over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Intercept	-2.449	-2.406	-2.435	-2.438
Age minus 65 (years above 65, continuous)	-0.004	-0.006	-0.006	-0.005
Male	0.076	0.083	0.081	0.077
History of coronary artery bypass graft (CABG) surgery	-0.034	-0.062	-0.026	-0.039
Severe infection; other infectious diseases (CC 1, 3-7)	0.030	0.026	0.017	0.023
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	0.040	0.041	0.056	0.042
Metastatic cancer and acute leukemia (CC 8)	0.213	0.159	0.213	0.192
Lung and other severe cancers (CC 9)	0.136	0.154	0.135	0.140
Lymphoma; other cancers (CC 10-12)	0.032	0.020	0.011	0.021
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	0.080	0.074	0.075	0.075
Protein-calorie malnutrition (CC 21)	0.110	0.114	0.136	0.119
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	0.112	0.151	0.139	0.134
Other gastrointestinal disorders (CC 38)	0.074	0.063	0.069	0.070
Severe hematological disorders (CC 46)	0.221	0.207	0.262	0.228
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	0.183	0.185	0.181	0.182
Dementia or other specified brain disorders (CC 51-53)	-0.012	-0.025	-0.009	-0.018
Drug/alcohol abuse/dependence/psychosis (CC 54-56)	0.098	0.096	0.075	0.091
Major psychiatric disorders (CC 57-59)	0.033	0.031	0.015	0.026
Other psychiatric disorders (CC 63)	0.058	0.049	0.062	0.057
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	0.097	0.085	0.094	0.090
Respirator dependence/tracheostomy status (CC 82)	0.117	0.126	0.081	0.102
Respiratory arrest; cardio-respiratory failure and shock (CC 83-84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 83-84 plus ICD-9-CM diagnosis codes 799.01 and 799.02, for discharges prior to October 1, 2015)	0.142	0.146	0.145	0.147
Congestive heart failure (CC 85)	0.144	0.125	0.144	0.137
Acute coronary syndrome (CC 86-87)	0.088	0.077	0.072	0.076
Coronary atherosclerosis or angina (CC 88-89)	0.046	0.047	0.047	0.045
Valvular and rheumatic heart disease (CC 91)	0.071	0.062	0.070	0.069

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	0.082	0.070	0.064	0.074
Stroke (CC 99-100)	0.027	0.040	0.039	0.034
Vascular or circulatory disease (CC 106-109)	0.038	0.040	0.043	0.040
Chronic obstructive pulmonary disease (COPD) (CC 111)	0.155	0.137	0.143	0.144
Fibrosis of lung or other chronic lung disorders (CC 112)	0.100	0.085	0.091	0.094
Asthma (CC 113)	-0.015	0.009	-0.002	-0.004
Pneumonia (CC 114-116)	0.067	0.056	0.064	0.062
Pleural effusion/pneumothorax (CC 117)	0.096	0.094	0.079	0.089
Other respiratory disorders (CC 118)	0.014	0.019	0.004	0.015
Dialysis status (CC 134)	0.200	0.159	0.137	0.163
Renal failure (CC 135-140)	0.143	0.144	0.164	0.150
Urinary tract infection (CC 144)	0.051	0.047	0.053	0.050
Other urinary tract disorders (CC 145)	0.036	0.044	0.044	0.042
Decubitus ulcer or chronic skin ulcer (CC 157-161)	0.079	0.092	0.096	0.086
Vertebral fractures without spinal cord injury (CC 169)	0.086	0.081	0.069	0.081
Other injuries (CC 174)	0.030	0.043	0.033	0.038

Table 4.5.3 – Adjusted OR and 95% CIs for the Pneumonia Hierarchical Logistic Regression Model over Different Time Periods

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Age minus 65 (years above 65, continuous)	1.00 (0.99 - 1.00)	0.99 (0.99 - 0.99)	0.99 (0.99 - 1.00)	0.99 (0.99 - 1.00)
Male	1.08 (1.06 - 1.10)	1.09 (1.07 - 1.10)	1.08 (1.07 - 1.10)	1.08 (1.07 - 1.09)
History of coronary artery bypass graft (CABG) surgery	0.97 (0.94 - 0.99)	0.94 (0.91 - 0.97)	0.97 (0.95 - 1.00)	0.96 (0.95 - 0.98)
Severe infection; other infectious diseases (CC 1, 3-7)	1.03 (1.01 - 1.05)	1.03 (1.01 - 1.04)	1.02 (1.00 - 1.04)	1.02 (1.01 - 1.03)
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	1.04 (1.02 - 1.06)	1.04 (1.02 - 1.06)	1.06 (1.03 - 1.08)	1.04 (1.03 - 1.06)
Metastatic cancer and acute leukemia (CC 8)	1.24 (1.19 - 1.28)	1.17 (1.13 - 1.22)	1.24 (1.19 - 1.28)	1.21 (1.19 - 1.24)
Lung and other severe cancers (CC 9)	1.15 (1.11 - 1.18)	1.17 (1.13 - 1.20)	1.14 (1.11 - 1.18)	1.15 (1.13 - 1.17)
Lymphoma; other cancers (CC 10-12)	1.03 (1.01 - 1.05)	1.02 (1.00 - 1.04)	1.01 (0.99 - 1.03)	1.02 (1.01 - 1.03)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	1.08 (1.07 - 1.10)	1.08 (1.06 - 1.09)	1.08 (1.06 - 1.10)	1.08 (1.07 - 1.09)
Protein-calorie malnutrition (CC 21)	1.12 (1.09 - 1.14)	1.12 (1.10 - 1.14)	1.15 (1.12 - 1.17)	1.13 (1.11 - 1.14)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	1.12 (1.10 - 1.14)	1.16 (1.14 - 1.19)	1.15 (1.13 - 1.17)	1.14 (1.13 - 1.16)
Other gastrointestinal disorders (CC 38)	1.08 (1.06 - 1.10)	1.06 (1.05 - 1.08)	1.07 (1.05 - 1.09)	1.07 (1.06 - 1.08)

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Severe hematological disorders (CC 46)	1.25 (1.19 - 1.31)	1.23 (1.17 - 1.29)	1.30 (1.24 - 1.36)	1.26 (1.22 - 1.29)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	1.20 (1.18 - 1.22)	1.20 (1.18 - 1.23)	1.20 (1.18 - 1.22)	1.20 (1.19 - 1.21)
Dementia or other specified brain disorders (CC 51-53)	0.99 (0.97 - 1.01)	0.98 (0.96 - 0.99)	0.99 (0.97 - 1.01)	0.98 (0.97 - 0.99)
Drug/alcohol abuse/dependence/psychosis (CC 54-56)	1.10 (1.08 - 1.13)	1.10 (1.08 - 1.12)	1.08 (1.05 - 1.10)	1.10 (1.08 - 1.11)
Major psychiatric disorders (CC 57-59)	1.03 (1.01 - 1.06)	1.03 (1.01 - 1.05)	1.02 (0.99 - 1.04)	1.03 (1.01 - 1.04)
Other psychiatric disorders (CC 63)	1.06 (1.04 - 1.08)	1.05 (1.03 - 1.07)	1.06 (1.04 - 1.08)	1.06 (1.05 - 1.07)
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	1.10 (1.07 - 1.13)	1.09 (1.06 - 1.12)	1.10 (1.07 - 1.13)	1.09 (1.08 - 1.11)
Respirator dependence/tracheostomy status (CC 82)	1.12 (1.06 - 1.19)	1.13 (1.07 - 1.20)	1.08 (1.02 - 1.15)	1.11 (1.07 - 1.15)
Respiratory arrest; cardio-respiratory failure and shock (CC 83-84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 83-84 plus ICD-9-CM diagnosis codes 799.01 and 799.02, for discharges prior to October 1, 2015)	1.15 (1.13 - 1.18)	1.16 (1.13 - 1.18)	1.16 (1.13 - 1.18)	1.16 (1.14 - 1.17)
Congestive heart failure (CC 85)	1.15 (1.13 - 1.18)	1.13 (1.11 - 1.16)	1.15 (1.13 - 1.18)	1.15 (1.13 - 1.16)
Acute coronary syndrome (CC 86-87)	1.09 (1.06 - 1.12)	1.08 (1.05 - 1.11)	1.07 (1.05 - 1.10)	1.08 (1.06 - 1.10)
Coronary atherosclerosis or angina (CC 88-89)	1.05 (1.03 - 1.07)	1.05 (1.03 - 1.07)	1.05 (1.03 - 1.07)	1.05 (1.04 - 1.06)
Valvular and rheumatic heart disease (CC 91)	1.07 (1.05 - 1.09)	1.06 (1.05 - 1.08)	1.07 (1.05 - 1.09)	1.07 (1.06 - 1.08)
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	1.09 (1.07 - 1.10)	1.07 (1.05 - 1.09)	1.07 (1.05 - 1.09)	1.08 (1.07 - 1.09)
Stroke (CC 99-100)	1.03 (1.00 - 1.05)	1.04 (1.01 - 1.07)	1.04 (1.01 - 1.07)	1.04 (1.02 - 1.05)
Vascular or circulatory disease (CC 106-109)	1.04 (1.02 - 1.06)	1.04 (1.02 - 1.06)	1.04 (1.03 - 1.06)	1.04 (1.03 - 1.05)
Chronic obstructive pulmonary disease (COPD) (CC 111)	1.17 (1.15 - 1.19)	1.15 (1.13 - 1.17)	1.15 (1.13 - 1.17)	1.16 (1.14 - 1.17)
Fibrosis of lung or other chronic lung disorders (CC 112)	1.11 (1.08 - 1.13)	1.09 (1.06 - 1.11)	1.10 (1.07 - 1.12)	1.10 (1.08 - 1.11)
Asthma (CC 113)	0.99 (0.96 - 1.01)	1.01 (0.99 - 1.03)	1.00 (0.98 - 1.02)	1.00 (0.98 - 1.01)
Pneumonia (CC 114-116)	1.07 (1.05 - 1.09)	1.06 (1.04 - 1.08)	1.07 (1.05 - 1.09)	1.06 (1.05 - 1.08)
Pleural effusion/pneumothorax (CC 117)	1.10 (1.08 - 1.12)	1.10 (1.08 - 1.12)	1.08 (1.06 - 1.11)	1.09 (1.08 - 1.11)
Other respiratory disorders (CC 118)	1.01 (1.00 - 1.03)	1.02 (1.00 - 1.04)	1.00 (0.99 - 1.02)	1.01 (1.00 - 1.02)
Dialysis status (CC 134)	1.22 (1.18 - 1.27)	1.17 (1.13 - 1.22)	1.15 (1.10 - 1.19)	1.18 (1.15 - 1.20)

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Renal failure (CC 135-140)	1.15 (1.13 - 1.17)	1.15 (1.13 - 1.18)	1.18 (1.16 - 1.20)	1.16 (1.15 - 1.17)
Urinary tract infection (CC 144)	1.05 (1.03 - 1.07)	1.05 (1.03 - 1.07)	1.05 (1.03 - 1.07)	1.05 (1.04 - 1.06)
Other urinary tract disorders (CC 145)	1.04 (1.02 - 1.06)	1.05 (1.03 - 1.07)	1.04 (1.02 - 1.07)	1.04 (1.03 - 1.05)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	1.08 (1.06 - 1.11)	1.10 (1.07 - 1.12)	1.10 (1.08 - 1.13)	1.09 (1.08 - 1.10)
Vertebral fractures without spinal cord injury (CC 169)	1.09 (1.06 - 1.12)	1.08 (1.05 - 1.12)	1.07 (1.03 - 1.11)	1.08 (1.06, 1.11)
Other injuries (CC 174)	1.03 (1.01 - 1.05)	1.04 (1.03 - 1.06)	1.03 (1.02 - 1.05)	1.04 (1.03 - 1.05)

Table 4.5.4 – Pneumonia Generalized Linear Modeling (Logistic Regression) Performance over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Predictive ability, % (lowest decile – highest decile)	8.4 - 30.5	8.5 - 30.8	8.1 - 30.6	8.4 - 30.6
c-statistic	0.63	0.63	0.64	0.63

Table 4.5.5 – Distribution of Hospital Pneumonia Admission Volumes over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	4,683	4,654	4,613	4,764
Mean number of admissions (SD)	108.5 (118.1)	102.0 (113.0)	95.9 (106.2)	299.2 (333.4)
Range (min. – max.)	1 - 1,208	1 - 1,279	1 - 1,206	1 - 3,691
25th percentile	25	23	22	66
50th percentile	67	62	58	180
75th percentile	153	146	138	429

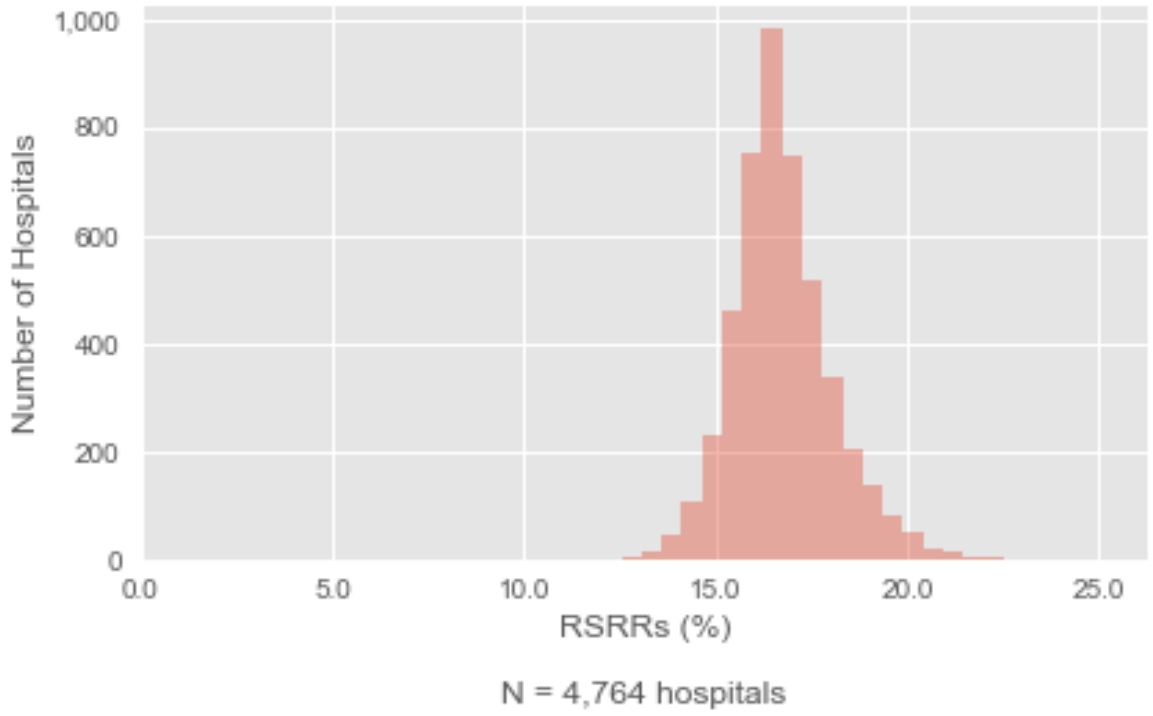
Table 4.5.6 – Distribution of Hospital Pneumonia RSRRs over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	4,683	4,654	4,613	4,764
Mean (SD)	16.7 (0.9)	16.9 (1.0)	16.6 (0.9)	16.8 (1.3)
Range (min. – max.)	13.6 - 22.2	13.3 - 26.9	13.0 - 23.3	12.5 - 25.6
25th percentile	16.2	16.3	16.1	15.9
50th percentile	16.6	16.8	16.5	16.6
75th percentile	17.2	17.4	17.0	17.5

Table 4.5.7 – Between-Hospital Variance for Pneumonia

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Between-hospital variance (SE)	0.023 (0.002)	0.025 (0.002)	0.023 (0.002)	0.025 (0.001)

Figure 4.5.2 – Distribution of Hospital 30-Day Pneumonia RSRRs between July 2014 and June 2017



4.6. Stroke Readmission 2018 Model Results

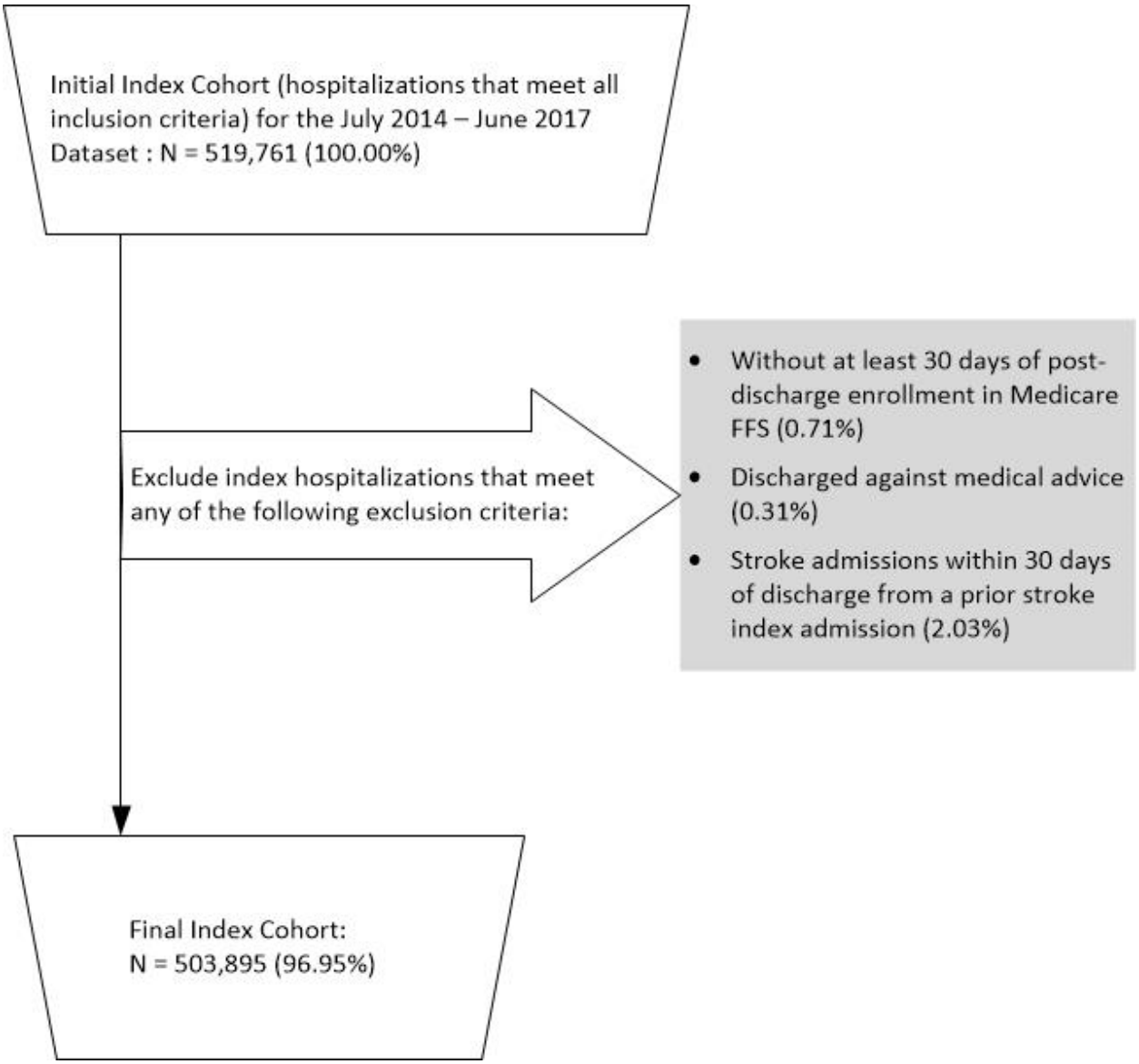
4.6.1 Index Cohort Exclusions

The exclusion criteria for this measure are presented in Section 2.2.1. The percentage of stroke admissions that met each exclusion criterion in the July 2014-June 2017 dataset is presented in Figure 4.6.1.

Admissions may have been counted in more than one exclusion category because they are not mutually exclusive. The index cohort includes short-term acute care hospitalizations for patients:

- Aged 65 or over;
- With a principal discharge diagnosis of ischemic stroke;
- Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission;
- Who were not transferred to another acute care facility; and,
- Were alive at discharge.

Figure 4.6.1 – Stroke Cohort Exclusions in the July 2014-June 2017 Dataset



4.6.2 Frequency of Stroke Model Variables

We examined the change in the frequencies of clinical and demographic variables. Frequencies of model variables were quite stable over the measurement period. The largest changes in the frequencies (those greater than 2% absolute change) include:

- An increase in Renal failure (29.4% to 31.8%)
- A decrease in Ischemic or unspecified stroke (22.5% to 20.3%)

Refer to Table 4.6.1 for more detail. Note that the increases and decreases in some model variables may reflect not only changes in rates of comorbidities in the Medicare FFS population, but also changes due to ICD-10 code implementation effective with October 1, 2015+ discharges.

4.6.3 Stroke Model Parameters and Performance

Table 4.6.2 shows hierarchical logistic regression model variable coefficients by individual year and for the combined three-year dataset. Table 4.6.3 shows the risk-adjusted ORs and 95% CIs for the stroke readmission model by individual year and for the combined three-year dataset. Overall, the variable effect sizes were relatively constant across years. In addition, model performance was stable over the three-year time period; the c-statistic increased slightly from 0.61 to 0.62 (Table 4.6.4).

4.6.4 Distribution of Hospital Volumes and Readmission Rates for Stroke

The national observed readmission rate in the combined three-year dataset was 11.9%. Between July 2014-June 2015 and July 2016-June 2017, the observed rate decreased from 12.3% to 11.6%.

Table 4.6.5 shows the distribution of hospital admission volumes, and Table 4.6.6 shows the distribution of hospital RSRRs. The mean RSRR decreased over the three-year period, from 12.3% (between July 2014 and June 2015) to 11.6% (between July 2016 and June 2017). The median hospital RSRR in the combined three-year dataset was 11.8% (IQR: 11.6% - 12.2%). Table 4.6.7 shows the between-hospital variance by individual year, as well as for the combined three-year dataset. Between-hospital variance in the combined dataset was 0.026 (SE: 0.002).

Figure 4.6.2 shows the overall distribution of the hospital RSRRs for the combined three-year dataset. The odds of all-cause readmission if a patient is treated at a hospital one SD above the national rate were 1.38 times higher than the odds of all-cause readmission if treated at a hospital one SD below the national rate. If there were no systematic differences between hospitals, the OR would be 1.0.[23]

4.6.5 Distribution of Hospitals by Performance Category in the Three-Year Dataset

Of 4,344 hospitals in the study cohort, 7 performed “Better than the National Rate,” 2,508 performed “No Different from the National Rate,” and 33 performed “Worse than

the National Rate." 1,796 were classified as "Number of Cases Too Small" (fewer than 25) to reliably conclude how the hospital is performing.

Table 4.6.1 – Frequency of Stroke Model Variables over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Total N	168,204	166,994	168,697	503,895
Mean age minus 65 (SD)	15.1 (8.4)	15.0 (8.4)	14.8 (8.4)	15.0 (8.4)
Male (%)	42.4	42.8	43.2	42.8
Metastatic cancer and acute leukemia (CC 8)	2.2	2.4	2.6	2.4
Cancer (CC 9-14)	18.5	18.6	18.6	18.6
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	43.3	43.5	43.1	43.3
Protein-calorie malnutrition (CC 21)	6.5	6.5	7.0	6.7
Morbid obesity; other endocrine/metabolic/nutritional disorders (CC 22, 25-26)	85.6	86.0	86.3	86.0
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	26.2	26.3	26.1	26.2
Severe hematological disorders (CC 46)	0.9	0.8	0.8	0.8
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	37.1	36.4	36.2	36.6
Dementia or other specified brain disorders (CC 51-53)	31.4	31.7	31.6	31.6
Quadriplegia, paraplegia, functional disability (CC 70-73, 189-190)	2.5	2.7	2.8	2.7
Hemiplegia, paralysis, functional disability (CC 74, 103-105)	37.8	38.5	38.7	38.4
Seizure disorders and convulsions (CC 79)	7.6	7.6	7.5	7.6
Congestive heart failure (CC 85)	23.3	23.3	22.8	23.2
Hypertensive heart disease (CC 94)	4.4	4.1	4.5	4.3
Cerebral hemorrhage (CC 99)	2.2	2.3	2.3	2.3
Ischemic or unspecified stroke (CC 100)	22.5	21.7	20.3	21.5
Precerebral arterial occlusion and transient cerebral ischemia (CC 101)	22.4	21.6	20.8	21.6
Vascular or circulatory disease (CC 106-109)	32.1	32.5	32.5	32.4
Chronic obstructive pulmonary disease (COPD) (CC 111)	21.8	21.5	21.2	21.5
Other respiratory disorders (CC 118)	26.8	27.2	27.4	27.1
Dialysis status (CC 134)	1.6	1.6	1.7	1.6
Renal failure (CC 135-140)	29.4	30.7	31.8	30.6
Other urinary tract disorders (CC 145)	16.4	16.0	15.4	15.9
Decubitus ulcer or chronic skin ulcer (CC 157-161)	6.7	6.6	6.3	6.6
Major symptoms, abnormalities (CC 178)	64.2	64.1	64.2	64.1

Table 4.6.2 – Hierarchical Logistic Regression Model Variable Coefficients for Stroke over Different Time Periods

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Intercept	-2.518	-2.576	-2.634	-2.584
Age minus 65 (years above 65, continuous)	-0.001	-0.001	0.000	0.000
Male	0.033	0.040	0.077	0.050
Metastatic cancer and acute leukemia (CC 8)	0.285	0.357	0.390	0.344
Cancer (CC 9-14)	0.043	0.059	0.067	0.055
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	0.182	0.158	0.170	0.167

Variable	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Protein-calorie malnutrition (CC 21)	0.257	0.263	0.270	0.262
Morbid obesity; other endocrine/metabolic/nutritional disorders (CC 22, 25-26)	-0.037	-0.050	-0.015	-0.032
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	0.115	0.110	0.105	0.111
Severe hematological disorders (CC 46)	0.200	0.204	0.319	0.238
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	0.209	0.215	0.227	0.216
Dementia or other specified brain disorders (CC 51-53)	0.052	0.062	0.047	0.052
Quadriplegia, paraplegia, functional disability (CC 70-73, 189-190)	0.090	0.045	0.069	0.065
Hemiplegia, paralysis, functional disability (CC 74, 103-105)	0.124	0.083	0.103	0.104
Seizure disorders and convulsions (CC 79)	0.117	0.128	0.118	0.117
Congestive heart failure (CC 85)	0.161	0.161	0.136	0.151
Hypertensive heart disease (CC 94)	0.085	0.044	0.068	0.056
Cerebral hemorrhage (CC 99)	0.149	0.015	0.088	0.081
Ischemic or unspecified stroke (CC 100)	-0.013	0.011	-0.014	-0.004
Precerebral arterial occlusion and transient cerebral ischemia (CC 101)	-0.002	0.018	0.007	0.009
Vascular or circulatory disease (CC 106-109)	0.085	0.080	0.067	0.075
Chronic obstructive pulmonary disease (COPD) (CC 111)	0.165	0.167	0.202	0.179
Other respiratory disorders (CC 118)	0.040	0.022	0.023	0.031
Dialysis status (CC 134)	0.278	0.304	0.374	0.316
Renal failure (CC 135-140)	0.181	0.204	0.203	0.196
Other urinary tract disorders (CC 145)	0.085	0.095	0.088	0.090
Decubitus ulcer or chronic skin ulcer (CC 157-161)	0.058	0.063	0.095	0.072
Major symptoms, abnormalities (CC 178)	0.065	0.094	0.058	0.073

Table 4.6.3 – Adjusted OR and 95% CIs for the Stroke Hierarchical Logistic Regression Model over Different Time Periods

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Mean age minus 65 (SD)	1.00 (1.00 - 1.00)	1.00 (1.00 - 1.00)	1.00 (1.00 - 1.00)	1.00 (1.00 - 1.00)
Male (%)	1.03 (1.00 - 1.07)	1.04 (1.01 - 1.07)	1.08 (1.05 - 1.11)	1.05 (1.03 - 1.07)
Metastatic cancer and acute leukemia (CC 8)	1.33 (1.21 - 1.46)	1.43 (1.31 - 1.56)	1.48 (1.36 - 1.61)	1.41 (1.34 - 1.48)
Cancer (CC 9-14)	1.04 (1.00 - 1.09)	1.06 (1.02 - 1.10)	1.07 (1.03 - 1.11)	1.06 (1.03 - 1.08)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	1.20 (1.16 - 1.24)	1.17 (1.14 - 1.21)	1.18 (1.15 - 1.22)	1.18 (1.16 - 1.20)
Protein-calorie malnutrition (CC 21)	1.29 (1.23 - 1.36)	1.30 (1.23 - 1.37)	1.31 (1.24 - 1.38)	1.30 (1.26 - 1.34)
Morbid obesity; other endocrine/metabolic/nutritional disorders (CC 22, 25-26)	0.96 (0.92 - 1.01)	0.95 (0.91 - 1.00)	0.98 (0.94 - 1.03)	0.97 (0.94 - 0.99)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	1.12 (1.08 - 1.16)	1.12 (1.07 - 1.16)	1.11 (1.07 - 1.15)	1.12 (1.09 - 1.14)

Variable	07/2014-06/2015 OR (95% CI)	07/2015-06/2016 OR (95% CI)	07/2016-06/2017 OR (95% CI)	07/2014-06/2017 OR (95% CI)
Severe hematological disorders (CC 46)	1.22 (1.07 - 1.40)	1.23 (1.07 - 1.41)	1.38 (1.20 - 1.57)	1.27 (1.17 - 1.37)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	1.23 (1.19 - 1.27)	1.24 (1.20 - 1.28)	1.26 (1.21 - 1.30)	1.24 (1.22 - 1.27)
Dementia or other specified brain disorders (CC 51-53)	1.05 (1.02 - 1.09)	1.06 (1.03 - 1.10)	1.05 (1.01 - 1.08)	1.05 (1.03 - 1.07)
Quadriplegia, paraplegia, functional disability (CC 70-73, 189-190)	1.09 (1.01 - 1.19)	1.05 (0.96 - 1.14)	1.07 (0.99 - 1.16)	1.07 (1.02 - 1.12)
Hemiplegia, paralysis, functional disability (CC 74, 103-105)	1.13 (1.10 - 1.17)	1.09 (1.05 - 1.12)	1.11 (1.07 - 1.14)	1.11 (1.09 - 1.13)
Seizure disorders and convulsions (CC 79)	1.12 (1.07 - 1.18)	1.14 (1.08 - 1.20)	1.13 (1.07 - 1.19)	1.12 (1.09 - 1.16)
Congestive heart failure (CC 85)	1.17 (1.13 - 1.22)	1.17 (1.13 - 1.22)	1.15 (1.10 - 1.19)	1.16 (1.14 - 1.19)
Hypertensive heart disease (CC 94)	1.09 (1.02 - 1.17)	1.05 (0.97 - 1.12)	1.07 (1.00 - 1.15)	1.06 (1.02 - 1.10)
Cerebral hemorrhage (CC 99)	1.16 (1.06 - 1.27)	1.02 (0.93 - 1.11)	1.09 (1.00 - 1.20)	1.08 (1.03 - 1.14)
Ischemic or unspecified stroke (CC 100)	0.99 (0.95 - 1.03)	1.01 (0.97 - 1.05)	0.99 (0.95 - 1.03)	1.00 (0.97 - 1.02)
Precerebral arterial occlusion and transient cerebral ischemia (CC 101)	1.00 (0.96 - 1.04)	1.02 (0.98 - 1.06)	1.01 (0.97 - 1.05)	1.01 (0.99 - 1.03)
Vascular or circulatory disease (CC 106-109)	1.09 (1.05 - 1.13)	1.08 (1.05 - 1.12)	1.07 (1.03 - 1.11)	1.08 (1.06 - 1.10)
Chronic obstructive pulmonary disease (COPD) (CC 111)	1.18 (1.14 - 1.22)	1.18 (1.14 - 1.23)	1.22 (1.18 - 1.27)	1.20 (1.17 - 1.22)
Other respiratory disorders (CC 118)	1.04 (1.01 - 1.08)	1.02 (0.99 - 1.06)	1.02 (0.99 - 1.06)	1.03 (1.01 - 1.05)
Dialysis status (CC 134)	1.32 (1.20 - 1.45)	1.36 (1.23 - 1.49)	1.45 (1.33 - 1.59)	1.37 (1.30 - 1.45)
Renal failure (CC 135-140)	1.20 (1.16 - 1.24)	1.23 (1.18 - 1.27)	1.22 (1.18 - 1.27)	1.22 (1.19 - 1.24)
Other urinary tract disorders (CC 145)	1.09 (1.05 - 1.13)	1.10 (1.06 - 1.14)	1.09 (1.05 - 1.14)	1.09 (1.07 - 1.12)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	1.06 (1.00 - 1.12)	1.06 (1.01 - 1.13)	1.10 (1.04 - 1.16)	1.07 (1.04 - 1.11)
Major symptoms, abnormalities (CC 178)	1.07 (1.03 - 1.11)	1.10 (1.06 - 1.14)	1.06 (1.02 - 1.10)	1.08 (1.05 - 1.10)

Table 4.6.4 – Stroke Generalized Linear Modeling (Logistic Regression) Performance over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Predictive ability, % (lowest decile – highest decile)	7.0 - 21.8	6.3 - 20.9	6.5 - 21.3	6.5 - 21.4
c-statistic	0.61	0.61	0.62	0.61

Table 4.6.5 – Distribution of Hospital Stroke Admission Volumes over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	4,050	3,972	3,935	4,344
Mean number of admissions (SD)	41.5 (56.2)	42.0 (57.7)	42.9 (59.5)	116.0 (168.6)
Range (min. – max.)	1 - 561	1 - 628	1 - 553	1 - 1,742
25th percentile	5	4	4	9
50th percentile	18	17	18	40
75th percentile	58	59	60	162

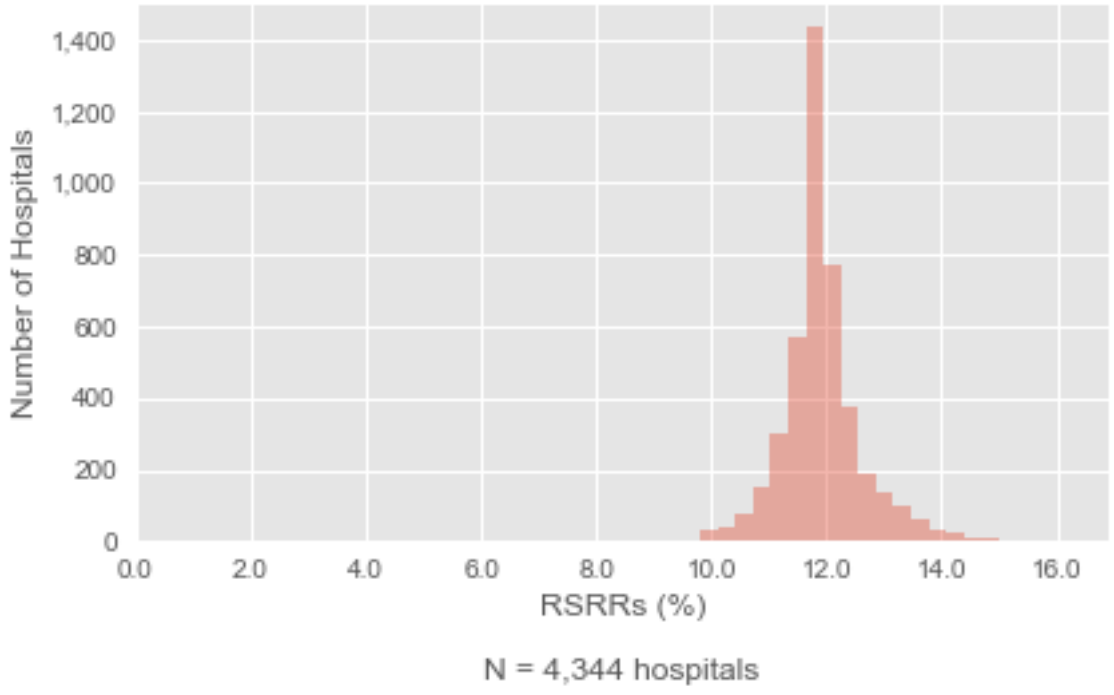
Table 4.6.6 – Distribution of Hospital Stroke RSRRs over Different Time Periods

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Number of hospitals	4,050	3,972	3,935	4,344
Mean (SD)	12.3 (0.4)	11.8 (0.4)	11.6 (0.4)	11.9 (0.7)
Range (min. – max.)	10.4 - 14.9	9.9 - 15.9	10.0 - 13.9	8.9 - 16.5
25th percentile	12.1	11.6	11.5	11.6
50th percentile	12.3	11.7	11.6	11.8
75th percentile	12.5	11.9	11.8	12.2

Table 4.6.7 – Between-Hospital Variance for Stroke

Characteristic	07/2014-06/2015	07/2015-06/2016	07/2016-06/2017	07/2014-06/2017
Between-hospital variance (SE)	0.021 (0.004)	0.021 (0.004)	0.020 (0.004)	0.026 (0.002)

Figure 4.6.2 – Distribution of Hospital 30-Day Stroke RSRRs between July 2014 and June 2017



5. GLOSSARY

Acute care hospital: A hospital that provides inpatient medical care for surgery and acute medical conditions or injuries. Short-term acute care hospitals provide care for short-term illnesses and conditions.

Bootstrapping: The bootstrap is a computer-based method for estimating the standard error of an estimate when the estimate is based on a sample with an unknown probability distribution. Bootstrap methods depend on the bootstrap sample, which is a random sample of size *n* drawn with replacement from the population of *n* objects. The bootstrap algorithm works by drawing many independent bootstrap samples, evaluating the corresponding bootstrap replications, and estimating the standard error of the statistic by the empirical standard deviation of the replications.

C-statistic: An indicator of the model's discriminant ability or ability to correctly classify those who have and have not been readmitted within 30 days of discharge. Potential values range from 0.5, meaning no better than chance, to 1.0, an indication of perfect prediction. Perfect prediction implies that patients' outcomes can be predicted completely by their risk factors, and physicians and hospitals play no role in their patients' outcomes.

Case mix: The particular illness severity, age, and, for some measures, gender characteristics of patients with index admissions at a given hospital.

Clinical Classification Software (CCS): Software maintained by the AHRQ that groups thousands of individual procedure and diagnosis codes into clinically coherent, mutually exclusive procedure and diagnosis categories. AHRQ CCS categories are used to determine if a readmission is planned. AHRQ CCS procedure categories are used to define planned and potentially planned procedures. AHRQ CCS diagnosis categories are used to define acute diagnoses and complications of care that are considered unplanned, as well as a few specific types of care that are always considered planned (for example, maintenance chemotherapy). Mappings which show the assignment of ICD-9 and ICD-10 codes to the AHRQ CCS diagnosis and procedure categories are available on the AHRQ website.

Cohort: The index admissions used to calculate the measure after inclusion and exclusion criteria have been applied.

Comorbidities: Medical conditions the patient had in addition to his/her primary reason for admission to the hospital.

Complications: Medical conditions that may have occurred as a consequence of care rendered during hospitalization.

Condition Categories (CCs): Groupings of ICD-9-CM/ICD-10-CM diagnosis codes in clinically relevant categories, from the HCCs system.[24,25] CMS uses the grouping but not the hierarchical logic of the system to create risk factor variables. Mappings which show the assignment of ICD-9 and ICD-10 codes to the CCs are available on the *QualityNet* website.

Confidence interval (CI): A CI is a range of values that describes the uncertainty surrounding an estimate. It is indicated by its endpoints; for example, a 95% CI for the OR associated with protein-calorie malnutrition noted as "1.09 – 1.15" would indicate that there is 95% confidence that the OR lies between 1.09 and 1.15.

Expected readmissions: The number of readmissions expected based on average hospital performance with a given hospital's case mix.

Hierarchical model: A widely accepted statistical method that enables evaluation of relative hospital performance by accounting for patient risk factors. This statistical model accounts for the hierarchical structure of the data (patients clustered within hospitals are assumed to be correlated) and accommodates modeling of the association between outcomes and patient characteristics. Based on the hierarchical model, we can evaluate (1) how much variation in hospital readmission rates overall is accounted for by patients' individual risk factors (such as age and other medical conditions), and (2) how much variation is accounted for by hospital contribution to readmission risk.

Hospital-specific effect: A measure of the hospital quality of care that is calculated through hierarchical logistic regression, taking into consideration how many patients were eligible for the cohort, these patients' risk factors, and how many were readmitted. The hospital-specific effect is the calculated random effect intercept for each hospital. The hospital-specific effect will be negative for a better-than-average hospital, positive for a worse-than-average hospital, and close to zero for an average hospital. The hospital-specific effect is used in the numerator to calculate "predicted" readmissions.

Index admission: Any admission included in the measure calculation as the initial admission for an episode of AMI, COPD, HF, pneumonia, or stroke care and evaluated for the outcome.

Interval estimate: Similar to a CI. The interval estimate is a range of probable values for the estimate that characterizes the amount of associated uncertainty. For example, a 95% interval estimate for a readmission rate indicates there is 95% confidence that the true value of the rate lies between the lower and the upper limit of the interval.

Medicare Fee-For-Service (FFS): Original Medicare plan in which providers receive a fee or payment for each individual service provided directly from Medicare. Only beneficiaries in Medicare FFS, not in managed care (Medicare Advantage), are included in the measures.

National observed readmission rate: All included hospitalizations with the outcome divided by all included hospitalizations.

Odds ratio (OR): The ORs express the relative odds of the outcome for each of the predictor variables. For example, the OR for Protein-calorie malnutrition (CC 21) represents the odds of the outcome for patients with that risk variable present relative to those without the risk variable present. The model coefficient for each risk variable is the log (odds) for that variable.

Outcome: The result of a broad set of healthcare activities that affect patients' well-being. For readmission measures, the outcome is readmission within 30 days of discharge.

Planned readmissions: A readmission within 30 days of discharge from a short-term acute care hospital that is a scheduled part of the patient's plan of care. Planned readmissions are not captured in the outcomes of these measures.

Predicted readmissions: The number of readmissions within 30 days predicted based on the hospital's performance with its observed case mix, also referred to as "adjusted actual" readmissions.

Predictive ability: An indicator of the model's discriminant ability or ability to distinguish high-risk subjects from low-risk subjects. A wide range between the lowest decile and highest decile suggests better discrimination.

Risk-adjustment variables: Patient demographics and comorbidities used to standardize rates for differences in case mix across hospitals.

Unplanned readmissions: Acute clinical events a patient experienced that require urgent rehospitalization. Unplanned readmissions are the outcomes of these measures.

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7. APPENDICES

Appendix A. Statistical Approach for AMI, COPD, HF, Pneumonia, and Stroke Measures

The condition-specific measures use hierarchical generalized linear models (HGLMs) to estimate risk-standardized readmission rates for hospitals. This modeling approach accounts for the within-hospital correlation of the observed outcome, and accommodates the assumption that underlying differences in quality across hospitals lead to systematic differences in outcomes.

In each measure, an HGLM model is estimated. Then for each hospital, a standardized readmission ratio (SRR) is calculated. The RSRR is calculated by multiplying the SRR for each hospital by the national observed readmission rate.

Hierarchical Generalized Linear Model

For each measure, we fit an HGLM, which accounts for clustering of observations within hospitals. We assume the outcome has a known exponential family distribution and relates linearly to the covariates via a known link function, *h*. Specifically, we assume a binomial distribution and a logit link function. Further, we account for the clustering within hospitals by estimating a hospital-specific effect, α_i, which we assume follows a normal distribution with a mean μ and variance τ^2, the between-hospital variance component. The following equation defines the HGLM:

$$h\left(\Pr\left(Y_{ij}=1\middle|\boldsymbol{Z}_{ij},\omega_i\right)\right)=log\left(\frac{\Pr(Y_{ij}=1|\boldsymbol{Z}_{ij},\omega_i)}{1-\Pr(Y_{ij}=1|\boldsymbol{Z}_{ij},\omega_i)}\right)=\alpha_i+\boldsymbol{\beta Z}_{ij} \qquad (1)$$

$$\text{where } \alpha_i=\mu+\omega_i;\ \omega_i{\sim}N(0,\tau^2)$$

$$\text{i=1,…, I; j=1,…,}n_i$$

where Y_{ij} denotes the outcome (equal to 1 if the patient is readmitted within 30 days, 0 otherwise) for the *j-th* patient at the *i-th* hospital; $\boldsymbol{Z}_{ij}=\left(Z_{ij1},Z_{ij2},\ldots,Z_{ijp}\right)^T$ is a set of *p* patient-specific covariates derived from the data; and *I* denotes the total number of hospitals and n_i denotes the number of index admissions at hospital *i*. The hospital-specific intercept of the *i-th* hospital, α_i, defined above, comprises μ, the adjusted average intercept over all hospitals in the sample, and ω_i, the hospital-specific intercept deviation from μ.[26]

We estimate the HGLMs using the SAS software system (GLIMMIX procedure).

Risk-Standardized Measure Score Calculation

Using the HGLM defined by Equation (1), to obtain the parameter estimates $\hat{\mu}$, $\{\hat{\alpha}_1,\hat{\alpha}_2,\ldots,\hat{\alpha}_I\}$, $\widehat{\boldsymbol{\beta}}$, and $\hat{\tau}^2$, we calculate an SRR, $\hat{s}_i$, for each hospital by computing the number of the predicted readmissions to the number of expected readmissions. Specifically, we calculate:

$$\text{Predicted Value: } \hat{p}_{ij}=h^{-1}\left(\hat{\alpha}_i+\widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij}\right)=\frac{\exp(\hat{\alpha}_i+\widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij})}{\exp(\hat{\alpha}_i+\widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij})+1} \qquad (2)$$

Expected Value: $\hat{e}_{ij} = h^{-1}\left(\hat{\mu} + \widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij}\right) = \frac{\exp(\hat{\mu}+\widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij})}{\exp(\hat{\mu}+\widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij})+1}$ (3)

Standardized Readmission Ratio: $\hat{s}_i = \frac{\sum_{j=1}^{n_i} \hat{p}_{ij}}{\sum_{j=1}^{n_i} \hat{e}_{ij}}$ (4)

We calculate an RSRR, $\widehat{RSRR}_i$, for each hospital by using the estimate from Equation (4) and multiplying by the national observed readmission rate, denoted by $\bar{y}$. Specifically, we calculate:

Risk-Standardized Readmission Rate: $\widehat{RSRR}_i = \hat{s}_i \times \bar{y}$ (5)

Creating Interval Estimates

The measure score is a complex function of parameter estimates; therefore, we use re-sampling and simulation techniques to derive an interval estimate to determine if a hospital is performing better than, worse than, or no different than expected. A hospital is considered better than expected if the upper bound of their confidence interval falls below the national observed readmission rate, $\bar{y}$, and considered worse if the lower bound of their entire confidence interval falls above $\bar{y}$. A hospital is considered no different than expected if the confidence interval overlaps $\bar{y}$.

More specifically, we use bootstrapping procedures to compute confidence intervals. Because the theoretical-based standard errors are not easily derived, and to avoid making unnecessary assumptions, we use the bootstrap to empirically construct the sampling distribution for each hospital risk-standardized ratio. The bootstrapping algorithm is described below.

Bootstrapping Algorithm

Let *I* denote the total number of hospitals in the sample. We repeat steps 1 – 4 below for b = 1,2,…B times:

1. Sample *I* hospitals with replacement.
2. Fit the hierarchical logistic regression model defined by Equation (1) using all patients within each sampled hospital. The starting values are the parameter estimates obtained by fitting the model to all hospitals. If some hospitals are selected more than once in a bootstrapped sample, we treat them as distinct so that we have *I* random effects to estimate the variance components. After Step 2, we have:
    a. The estimated regression coefficients of the risk factors, $\widehat{\boldsymbol{\beta}}^{(b)}$.
    b. The parameters governing the random effects, hospital adjusted outcomes, distribution $\hat{\mu}^{(b)}$ and $\hat{\tau}^{2(b)}$.
    c. The set of hospital-specific intercepts and corresponding variances,$\left\{\hat{\alpha}_i^{(b)}, \hat{var}\left(\alpha_i^{(b)}\right); i = 1,2,\ldots,I\right\}$
3. We generate a hospital random effect by sampling from the distribution of the hospital-specific distribution obtained in Step 2c. We approximate the distribution for each random effect by a

normal distribution. Thus, we draw $\alpha_i^{(b*)} \sim N(\hat{\alpha}_i^{(b)}, \hat{var}\left(\alpha_i^{(b)}\right))$ for the unique set of hospitals sampled in Step 1.

4. Within each unique hospital *i* sampled in Step 1, and for each case *j* in that hospital, we calculate $\hat{p}_{ij}^{(b)}$, $\hat{e}_{ij}^{(b)}$, and $\hat{s}_i^{(b)}$ where $\widehat{\boldsymbol{\beta}}^{(b)}$ and $\hat{\mu}^{(b)}$ are obtained from Step 2 and $\alpha_i^{(b*)}$ is obtained from Step 3.

Ninety-five percent interval estimates (or alternative interval estimates) for the hospital-standardized outcome can be computed by identifying the 2.5th and 97.5th percentiles of a large selected number of estimates for all hospitals (or the percentiles corresponding to the alternative desired intervals).[27]

Appendix B. Data QA

This production year required updates to all SAS packs to account for updates in ICD-10 codes and associated mappings of clinical groupers. To assure the quality of measure output, we utilized a multi-phase approach to QA of the readmission measures.

This section represents QA for the subset of the work CORE conducted to maintain and report these readmission measures. It does not describe the QA to process data and create the input files, nor does it include the QA for the final processing of production data for public reporting, because another contractor conducts that work.

Phase I

The first step in this year's QA process was to review changes in the cohort and outcomes definitions as determined by the measure-specific code set files that were updated to account for changes in ICD-10 coding. This included updates to the AHRQ CCS software and the HCC clinical category maps.

In general, we used both manual scan and descriptive analyses to conduct data validity checks, including cross-checking readmission information, distributions of ICD-9/ICD-10 codes, and frequencies of key variables.

Phase II

We updated the existing SAS packs to accommodate the new codes and updates to the measures. To assure accuracy in SAS pack coding, two analysts independently write SAS code for any major changes made in calculating the readmission measures: data preparation, sample selection, hierarchical modeling, and calculation of RSRRs. This process highlights any programming errors in syntax or logic. Once the parallel programming process is complete, the analysts cross-check their codes by analyzing datasets in parallel, checking for consistency of output, and reconciling any discrepancies.

Phase III

A third analyst reviews the finalized SAS code and recommends changes to the coding and readability of the SAS packs, where appropriate. The primary analyst receives the suggested changes for possible re-coding or program documentation when needed.

During this phase, we also compare prior years' risk-adjustment coefficients and variable frequencies to enable us to check for potential inconsistencies in the data and the impact of any changes to the SAS packs. Anything that seems outside of normal coding fluctuation is further reviewed in more detail.

Appendix C. Annual Updates

Prior annual updates for the measures can be found in the annual updates and specifications reports available on *QualityNet*. For convenience, we have listed all prior updates under the reporting year and corresponding report. In 2013, CMS began assigning version numbers to its measures. The measure specifications in the original methodology reports are considered Version 1.0 for each measure. The measures receive a new version number for each subsequent year of public reporting.

2018

2018 Measures Updates and Specifications Report (Version 11.0 - AMI, HF, and Pneumonia) (Version 7.0 - COPD and Stroke)

1. Updated the ICD-10 code-based specifications used in the measures. Specifically:
   - Incorporated the code changes that occurred in the FY 2017 version of the ICD-10-CM/PCS into the cohort definitions, planned readmission algorithm, and risk models;
   - Applied the 2017.1 and 2017.2 versions of the AHRQ CCS to the planned readmission algorithm for diagnoses and procedures, respectively;
   - Applied the FY 2017 version of the V22 CMS-HCC crosswalk maintained by RTI International to the risk models; and,
   - Conducted code surveillance to identify any specification changes warranted due to coding practices and patterns. Additionally, our clinical and measure experts reviewed the pre-existing ICD-10 code-based specifications to confirm the appropriateness of the specifications unaffected by the updates.
     - Rationale: Updated versions of the ICD-10-CM/PCS, AHRQ CCS, and CMS-HCC crosswalk were released. Revisions to the measure specifications were warranted to accommodate these updates.
2. Updated the methodology used in analytic input file production to identify transfers to rehabilitation units, to further ensure these transfers are not captured as readmissions for any hospital. In addition to the previous methods described in the 2010 and 2017 updates below and the 2010 Measures Maintenance Report, use of revenue center codes has been implemented, to help identify these cases in both ICD-9 and ICD-10 code-based claims. Specifically:
   - 0024: Inpatient Rehabilitation Facility services paid under PPS submitted as Type of Bill 11X
   - 0118: Private medical or general-rehabilitation
   - 0128: Semi-private 2 bed (medical or general)-rehabilitation
   - 0148: Private (deluxe)-rehabilitation
     - Rationale: The inability to use principal discharge diagnosis codes to identify rehabilitation stays (due to ICD-10 coding guidance) has led to an under-counting of these transfers primarily for Maryland hospitals and critical access hospitals, hospitals that are not part of the IPPS. Utilization of revenue center codes augments our ability to identify and exclude admissions to rehabilitation beds in these hospitals that are not identified through discharge disposition codes alone. Of note, rehabilitation units are most often identified by CMS certification number (CCN).
3. Removed the obstetric AHRQ CCS procedure and diagnosis categories from the planned readmission algorithm. Specifically, AHRQ CCS procedure categories 134 and 135 and AHRQ CCS diagnosis categories 194 and 196 were deleted from the always planned procedure and diagnosis lists, Tables PR.1 and PR.2, respectively. They remain in the SAS packs, but are commented out.

- Rationale: The obstetric codes were incorporated into initial planned readmission algorithm specifications during development. They were provided for all-payer settings, but are not applicable to the CMS readmission measures that include only those patients aged 65 or over.

2017

2017 Measures Updates and Specifications Report (Version 10.0 - AMI, HF, and Pneumonia) (Version 6.0 - COPD and Stroke)

1. Revised the measure specifications to accommodate the implementation of ICD-10 coding:
   - Identified the ICD-10 codes used to define each of the measure cohorts for discharges on or after October 1, 2015.
   - Updated the planned readmission algorithm, by using the most recent (2016) version of the ICD-10-based AHRQ CCS and ICD-10 codes for certain "potentially planned procedures" and "acute diagnoses" to the algorithm specifications, for discharges on or after October 1, 2015.
   - Re-specified the risk models, updating the CC-based risk variables to the ICD-10-compatible HCC system version 22 and applying ICD-10 codes for certain risk variables (for example, history of PTCA) to the models.
     - Rationale: The ICD-9 code sets used to report medical diagnoses and inpatient procedures were replaced by ICD-10 code sets on October 1, 2015. The U.S. Department of Health and Human Services (HHS) mandated that ICD-10 codes be used for medical coding, effective with October 1, 2015 discharges. The measurement period for 2017 public reporting required data from claims that include ICD-10 codes in addition to data from claims that include ICD-9 codes. Thus, re-specification was warranted to accommodate ICD-10 coding.
2. Updated the methodologies used to identify transfers to psychiatric and rehabilitation units, to ensure these transfers are not captured as readmissions for any hospital (as described in the 2010 update below and the 2010 Measures Maintenance Report):
   - Psychiatric admissions – Criterion (2) and (3) from the 2010 update apply. However, criterion (1) was modified slightly to:
     (1) the admission being evaluated as a potential readmission has a psychiatric principal discharge diagnosis code (ICD-9-CM codes beginning with '29', '30' or '31', for discharges prior to October 1, 2015, or ICD-10-CM codes beginning with 'F', for discharges on or after October 1, 2015).
   - Rehabilitation admissions – For discharges on or after October 1, 2015, the previous approach is replaced with:
     (1) the index admission has a discharge disposition code to a rehabilitation hospital or rehabilitation unit from the index admission; and,
     (2) the admission being evaluated as a potential readmission occurred on the same day as or the day following the index discharge.
     - Rationale: With the implementation of ICD-10 coding effective with discharges on or after October 1, 2015, the ICD-9-code-based criterion developed in 2010 needed to be re-specified. For psychiatric admissions, defining "psychiatric diagnosis" with ICD-10-CM codes for discharges on or after October 1, 2015 was a simple solution, as mental health diagnosis codes all reside under the Category 'F' (Mental, Behavioral and Neurodevelopmental disorders). However, for rehabilitation admissions, rehabilitation diagnosis codes are not coded consistently. Thus, re-defining the

V57.0 ICD-9-CM code criterion with ICD-10-CM codes was not a viable option, and a different strategy was warranted.

2016

2016 Measures Updates and Specifications Report (Version 9.0 - AMI, HF, and Pneumonia) (Version 5.0 - COPD and Stroke)

1. Updated the pneumonia measure specifications:[28]
   - ICD-9 cohort codes include aspiration pneumonia admissions as well as sepsis admissions (not including severe sepsis) that have a secondary diagnosis of pneumonia (including aspiration pneumonia) coded as POA and no secondary diagnosis of severe sepsis coded as POA.
     - Rationale: This expansion of the cohort allows the measure to capture a broader population of patients admitted for pneumonia and a more consistent clinical cohort across hospitals. This update was made in response to changes in coding practice leading to more pneumonia patients being coded with a principal discharge diagnosis of sepsis or aspiration pneumonia. The need to make these changes was further underscored by wide variation across hospitals in the use of sepsis codes and, to a lesser extent, aspiration pneumonia codes. Systematic changes and differences in hospital coding practices potentially bias efforts to compare hospital performance.
   - Updated the risk variable list in concordance with the expanded cohort (CC 77 and CC 78 added).
     - Rationale: Presence of Respirator dependence/tracheostomy status (CC 77) and presence of Respiratory arrest (CC 78) in the 12 months prior to the index admission had strong associations with readmission in the expanded pneumonia cohort and had high levels of face validity in terms of the clinical expectation that these conditions would be associated with worse outcomes if occurred during the 12-month time frame.
2. Re-specified the measures by updating to CMS planned readmission algorithm version 4.0.
   - Rationale: Version 4.0 incorporates improvements made following a validation study of the algorithm using data from a medical record review and input from clinical experts. These changes improve the accuracy of the algorithm by decreasing the number of readmissions that the algorithm mistakenly designates as planned/unplanned by removing five procedure categories and adding one procedure category.
3. Updated HF cohort to exclude patients with an LVAD implantation or heart transplantation either during the index admission or in the 12 months prior to the index admission.
   - Rationale: The use of LVADs, in particular, has increased dramatically since the time of measure development.[29] These patients represent a clinically distinct group.
4. Added one ischemic stroke code (ICD-9 code 436 Acute, but ill-defined, cerebrovascular disease) to the stroke measure.
   - Rationale: Although ICD-9 code 436 is not specific and could, in theory, include intracerebral hemorrhage, these codes are most commonly ischemic strokes coded as ICD-9 code 436.[30] This code may be used either because there is insufficient documentation to use a more specific code, or because some hospitals use older coding terminology to assign diagnoses of cerebrovascular accidents. Admissions coded with ICD-9 code 436 as the principal discharge diagnosis are appropriate inclusions for the stroke measure. Addition of this code will allow for a more comprehensive cohort of true ischemic stroke patients, across all hospitals.

5. Applied the 2015 version of the AHRQ CCS to the planned readmission algorithm.
   - Rationale: A 2015 version of the AHRQ CCS was released.

2015

2015 Measures Updates and Specifications Report (Version 8.0 - AMI, HF, and Pneumonia) (Version 4.0 - COPD and Stroke)

1. Applied the updated AHRQ CCS version to the planned readmission algorithm.
   - Rationale: An updated version of the AHRQ CCS was released in 2014.

2014

2014 Measures Updates and Specifications Report (Version 7.0 - AMI, HF, and Pneumonia) (Version 3.0 - COPD and Stroke)

1. Re-specified the measures by adding the CMS planned readmission algorithm version 3.0.
   - Rationale: Version 3.0 incorporates improvements made following a validation study of the algorithm using data from a medical record review. These changes improve the accuracy of the algorithm by decreasing the number of readmissions that the algorithm mistakenly designates as planned by removing two procedure categories and adding several acute diagnoses.
2. Applied the updated AHRQ CCS version to the planned readmission algorithm.
   - Rationale: An updated version of the AHRQ CCS was released in 2013.

2013

2013 Measures Updates and Specifications Report AMI, HF, Pneumonia (Version 6.0)

1. Re-specified the measures by adding the CMS planned readmission algorithm version 2.1.
   - Rationale: Unplanned readmissions are acute clinical events a patient experiences that require urgent rehospitalization. In contrast, planned readmissions are generally not a signal of quality of care. Including planned readmissions in a readmission measure could create a disincentive to provide appropriate care to patients scheduled for elective or necessary procedures within 30 days of discharge.
2. Updated CC map.
   - Rationale: Prior to 2014, the ICD-9-CM CC map was updated annually to capture all relevant comorbidities coded in patient administrative claims data.

2013 Measure Updates and Specifications Report COPD (Version 2.0)

1. Re-specified the measure by adding the CMS planned readmission algorithm version 2.1.
   - Rationale: Unplanned readmissions are acute clinical events a patient experiences that require urgent rehospitalization. In contrast, planned readmissions are generally not a signal of quality of care. Including planned readmissions in a readmission measure could create a disincentive to provide appropriate care to patients scheduled for elective or necessary procedures within 30 days of discharge.
2. Updated CC map.
   - Rationale: Prior to 2014, the ICD-9-CM CC map was updated annually to capture all relevant comorbidities coded in patient administrative claims data.

2013 Measure Updates and Specifications Report Stroke (Version 2.0)

1. Re-specified the measure by adding the CMS planned readmission algorithm version 2.1.
   - Rationale: Unplanned readmissions are acute clinical events a patient experiences that require urgent rehospitalization. In contrast, planned readmissions are generally not a signal

of quality of care. Including planned readmissions in a readmission measure could create a disincentive to provide appropriate care to patients scheduled for elective or necessary procedures within 30 days of discharge.

2. Updated CC map.
   - Rationale: Prior to 2014, the ICD-9-CM CC map was updated annually to capture all relevant comorbidities coded in patient administrative claims data.
3. Removed one stroke ICD-9 code (436)
   - Rationale: ICD-9-CM code 436 is not commonly used to define acute ischemic stroke.

2012

2012 Measures Maintenance Report AMI, HF, Pneumonia (Version 5.0)

1. Included VA one-day stays.
   - Rationale: Stays of fewer than 24 hours that result in death, discharge against medical advice, or transfer (or that follow a transfer) are not likely to be observation stays because the time frame of the admissions was determined not by clinical necessity but by other factors such as death or transfer. These stays had been previously excluded from the measure.
2. Incorporated Version 5010 format.
   - Rationale: Version 5010 increased the number of diagnoses and procedures hospitals could code on Medicare claims. The inclusion of 15 additional codes for diagnoses and 19 additional codes for procedures allows us to identify additional comorbidities, thereby increasing the accuracy of risk adjustment.
3. Updated CC map.
   - Rationale: Prior to 2014, the ICD-9-CM CC map was updated annually to capture all relevant comorbidities coded in patient administrative claims data.

2011

2011 Measures Maintenance Report AMI, HF, Pneumonia (Version 4.0)

1. Added two pneumonia codes (482.42 and 488.11).
   - Rationale: CMS updated ICD-9 cohort codes to distinguish between Methicillin susceptible and resistant Staphylococcus aureus pneumonia (482.41 and 482.42) and added a new code for viral pneumonia cases (488.11) to reflect the emergence of H1N1 influenza virus.
2. Included VA hospitals.
   - Rationale: Creates a more inclusive perspective of the relative quality of US hospitals.
3. Updated CC map.
   - Rationale: Prior to 2014, the ICD-9-CM CC map was updated annually to capture all relevant comorbidities coded in patient administrative claims data.

2010

2010 Measures Maintenance Report AMI, HF, Pneumonia (Version 3.0)

1. Revised period for collecting comorbidities from claims codes.
   - Rationale: The revised models use comorbidities coded within 365 days of admission rather than 365 days of discharge. This includes more clinical covariates for risk adjustment.
2. Updated the methodology used to determine readmission outcome in cases of admission to psychiatric and rehabilitation hospital units.
   - Rationale: Psychiatric and rehabilitation units within short-term acute care hospitals in Maryland have the same type of provider ID number (or CCN) as the acute care hospital in which they are housed. Transfers to these units can therefore look like readmissions. In

order to accurately assess readmissions in Maryland and allow for public reporting of Maryland readmission rates, methodologies to identify these cases were needed, to ensure these transfers are not counted as readmissions for any hospital. Rehabilitation admissions are identified by ICD-9-CM principal discharge diagnosis code (codes beginning with 'V57' indicate admission to a rehabilitation unit). A psychiatric admission is identified if all three of the following criteria are met:
(1) the admission being evaluated as a potential readmission has a psychiatric principal discharge diagnosis code (ICD-9-CM codes beginning with '29', '30', or '31');
(2) the index admission has a discharge disposition code to a psychiatric hospital or psychiatric unit from the index admission; and,
(3) the admission being evaluated as a potential readmission occurred during the same day as or the day following the index discharge.
Psychiatric/rehabilitation admissions identified as described above are not captured as readmissions. Note that we do not expect to see rehabilitation claims in hospital data from states other than Maryland.
   - The criteria for identifying such admissions are available in the 2010 Measures Maintenance Report.
3. Updated CC map.
   - Rationale: Prior to 2014, the ICD-9-CM CC map was updated annually to capture all relevant comorbidities coded in patient administrative claims data.

2009

2009 Measures Maintenance Report AMI, HF, Pneumonia (Version 2.0)

1. Used three years of claims and enrollment data for public reporting.
   - Rationale: Three years of data increased the precision of the hospital RSRR estimates by increasing the number of admissions used to calculate the rates. CMS developed the measures using one year of data.
2. Excluded patients discharged against medical advice.
   - Rationale: Providers are unable to deliver full care and prepare the patient for discharge when patients leave against medical advice.
3. Updated CC map.
   - Rationale: Prior to 2014, the ICD-9-CM CC map was updated annually to capture all relevant comorbidities coded in patient administrative claims data.

Appendix D. Measure Specifications

Appendix D.1 Hospital-Level 30-Day RSRR following AMI (NQF #0505)

Cohort

Inclusion Criteria for AMI Measure

1. **Principal discharge diagnosis of AMI**
   Rationale: AMI is the condition targeted for measurement (Table D.1.1).
2. **Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission, or those who are VA beneficiaries**
   Rationale: Claims data are consistently available only for Medicare FFS and VA beneficiaries. For patients who are not VA beneficiaries, the 12-month prior enrollment criterion ensures that patients were Medicare FFS beneficiaries and that their comorbidities are captured from claims for risk adjustment. Medicare Part A is required at the time of admission to non-VA hospitals to ensure that no Medicare Advantage patients are included in the measure.
3. **Aged 65 or over**
   Rationale: Medicare patients younger than 65 usually qualify for the program due to severe disability. They are not included in the measure because they are considered to be too clinically distinct from Medicare patients 65 and over.
4. **Discharged alive from a non-federal short-term acute care hospital or VA hospital**
   Rationale: It is only possible for patients to be readmitted if they are discharged alive.
5. **Not transferred to another acute care facility**
   Rationale: Hospitalizations that result in a transfer to another acute care facility are not included in the measure because the measure's focus is on admissions that result in discharge to a non-acute care setting (for example, to home or a skilled nursing facility).

Exclusion Criteria for AMI Measure

1. **Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries)**
   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.
2. **Discharged against medical advice**
   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.
3. **Same-day discharges**
   Rationale: Patients admitted and then discharged on the same day are not included as an index admission because it is unlikely that these admissions are for clinically significant AMIs.
4. **AMI admissions within 30 days of discharge from a prior AMI index admission**
   Rationale: Additional AMI admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission is not considered both an index admission and a readmission for another index admission.

Table D.1.1 below outlines the ICD-10-CM codes used to define the AMI cohort for discharges on or after October 1, 2015. ICD-9 code lists for discharges prior to October 1, 2015 can be found in the 2016 condition-specific readmission measures updates and specifications report posted on QualityNet.

Table D.1.1 – ICD-10-CM Codes for AMI Cohort

ICD-10-CM Codes	Description
I21.01	ST elevation (STEMI) myocardial infarction involving left main coronary artery
I21.02	ST elevation (STEMI) myocardial infarction involving left anterior descending coronary artery
I21.09	ST elevation (STEMI) myocardial infarction involving other coronary artery of anterior wall
I21.11	ST elevation (STEMI) myocardial infarction involving right coronary artery
I21.19	ST elevation (STEMI) myocardial infarction involving other coronary artery of inferior wall
I21.21	ST elevation (STEMI) myocardial infarction involving left circumflex coronary artery
I21.29	ST elevation (STEMI) myocardial infarction involving other sites
I21.3	ST elevation (STEMI) myocardial infarction of unspecified site
I21.4	Non-ST elevation (NSTEMI) myocardial infarction

Risk Adjustment

The CCs outlined in Table D.1.2 below are used to identify risk variables in claims for discharges on or after October 1, 2015 as well as discharges prior to October 1, 2015.

The ICD-10 codes used to identify certain risk variables (for example, history of PTCA) in discharges on or after October 1, 2015 are posted on *QualityNet*; hyperlinks to these lists are provided in the table. For a list of ICD-9 codes used to identify these variables in discharges prior to October 1, 2015, please refer to the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Table D.1.2 – Risk Variables for AMI Measure

Description of Risk Variable	CCs and/or ICD-10 Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
Age minus 65 (years above 65, continuous)	n/a	
Male	n/a	
Anterior myocardial infarction	ICD-10-CM code list	
Non-anterior location of myocardial infarction	ICD-10-CM code list	
History of coronary artery bypass graft (CABG) surgery	ICD-10-CM code list and ICD-10-PCS code list	
History of percutaneous transluminal coronary angioplasty (PTCA)	ICD-10-CM code list and ICD-10-PCS code list	
Severe infection; other infectious diseases (CC 1, 3-7)	HIV/AIDS (CC 1)	
	Bacterial, fungal, and parasitic central nervous system infections (CC 3)	
	Viral and late effects central nervous system infections (CC 4)	
	Tuberculosis (CC 5)	
	Opportunistic infections (CC 6)	
	Other infectious diseases (CC 7)	X
Metastatic cancer and acute leukemia (CC 8)	Metastatic cancer and acute leukemia (CC 8)	
Cancer (CC 9-14)	Lung and other severe cancers (CC 9)	
	Lymphoma and other cancers (CC 10)	
	Colorectal, bladder, and other cancers (CC 11)	

Description of Risk Variable	CCs and/or ICD-10 Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Breast, prostate, and other cancers and tumors (CC 12)	
	Other respiratory and heart neoplasms (CC 13)	
	Other digestive and urinary neoplasms (CC 14)	
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	Diabetes with acute complications (CC 17)	X
	Diabetes with chronic complications (CC 18)	
	Diabetes without complications (CC 19)	
	Proliferative diabetic retinopathy and vitreous hemorrhage (CC 122)	
	Diabetic and other vascular retinopathies (CC 123)	
Protein-calorie malnutrition (CC 21)	Protein-calorie malnutrition (CC 21)	
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	Other significant endocrine and metabolic disorders (CC 23)	
	Disorders of fluid/electrolyte/acid-base balance (CC 24)	X
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	Iron deficiency or other/unspecified anemias and blood disease (CC 49)	
Dementia or other specified brain disorders (CC 51-53)	Dementia with complications (CC 51)	
	Dementia without complications (CC 52)	
	Nonpsychotic organic brain syndromes/conditions (CC 53)	
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	Quadriplegia (CC 70)	
	Paraplegia (CC 71)	
	Spinal cord disorders/injuries (CC 72)	
	Amyotrophic lateral sclerosis and other motor neuron disease (CC 73)	
	Cerebral palsy (CC 74)	
	Hemiplegia/hemiparesis (CC 103)	X
	Monoplegia, other paralytic syndromes (CC 104)	X
	Amputation status, lower limb/amputation complications (CC 189)	X
	Amputation status, upper limb (CC 190)	X
Congestive heart failure (CC 85)	Congestive heart failure (CC 85)	X
Acute coronary syndrome (CC 86-87)	Acute myocardial infarction (CC 86)	X
	Unstable angina and other acute ischemic heart disease (CC 87)	X
Angina pectoris (CC 88)	Angina pectoris (CC 88)	
Coronary atherosclerosis/other chronic ischemic heart disease (CC 89)	Coronary atherosclerosis/other chronic ischemic heart disease (CC 89)	
Valvular and rheumatic heart disease (CC 91)	Valvular and rheumatic heart disease (CC 91)	
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	Specified heart arrhythmias (CC 96)	X
	Other heart rhythm and conduction disorders (CC 97)	X

Description of Risk Variable	CCs and/or ICD-10 Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
Stroke (CC 99-100)	Cerebral hemorrhage (CC 99)	X
	Ischemic or unspecified stroke (CC 100)	X
Cerebrovascular disease (CC 101-102, 105)	Precerebral arterial occlusion and transient cerebral ischemia (CC 101)	X
	Cerebrovascular atherosclerosis, aneurysm, and other disease (CC 102)	
	Late effects of cerebrovascular disease, except paralysis (CC 105)	
Vascular or circulatory disease (CC 106-109)	Atherosclerosis of the extremities with ulceration or gangrene (CC 106)	X
	Vascular disease with complications (CC 107)	X
	Vascular disease (CC 108)	X
	Other circulatory disease (CC 109)	X
Chronic obstructive pulmonary disease (COPD) (CC 111)	Chronic obstructive pulmonary disease (COPD) (CC 111)	
Asthma (CC 113)	Asthma (CC 113)	
Pneumonia (CC 114-116)	Aspiration and specified bacterial pneumonias (CC 114)	X
	Pneumococcal pneumonia, empyema, lung abscess (CC 115)	X
	Viral and unspecified pneumonia, pleurisy (CC 116)	
Dialysis status (CC 134)	Dialysis status (CC 134)	X
Renal failure (CC 135-140)	Acute renal failure (CC 135)	X
	Chronic kidney disease, stage 5 (CC 136)	
	Chronic kidney disease, severe (stage 4) (CC 137)	
	Chronic kidney disease, moderate (stage 3) (CC 138)	
	Chronic kidney disease, mild or unspecified (stages 1-2 or unspecified) (CC 139)	
	Unspecified renal failure (CC 140)	X
Other urinary tract disorders (CC 145)	Other urinary tract disorders (CC 145)	
Decubitus ulcer or chronic skin ulcer (CC 157-161)	Pressure ulcer of skin with necrosis through to muscle, tendon, or bone (CC 157)	X
	Pressure ulcer of skin with full thickness skin loss (CC 158)	X
	Pressure ulcer of skin with partial thickness skin loss (CC 159)	X
	Pressure pre-ulcer skin changes or unspecified stage (CC 160)	X
	Chronic ulcer of skin, except pressure (CC 161)	

Outcome

Outcome Criteria for AMI Measure

Unplanned readmission, from any cause, within 30 days from the date of discharge from an index admission.

Rationale: Planned readmissions are generally not a signal of quality of care. Including planned readmissions in a readmission measure could create a disincentive to provide appropriate care to patients who are scheduled for elective or necessary procedures within 30 days of discharge. From a patient perspective, an unplanned readmission from any cause is an adverse event. Outcomes occurring within 30 days of discharge can be influenced by hospital care and the early transition to the non-acute care setting. The 30-day time frame is a clinically meaningful period for hospitals to collaborate with their communities to reduce readmissions.

Appendix D.2 Hospital-Level 30-Day RSRR following COPD (NQF #1891)

Cohort

Inclusion Criteria for COPD Measure

1. **Principal discharge diagnosis of COPD or principal discharge diagnosis of acute respiratory failure with a secondary diagnosis of COPD with exacerbation**
   Rationale: COPD is the condition targeted for measurement. Acute respiratory failure admissions with a secondary diagnosis of COPD are also included to capture the full spectrum of severity among patients hospitalized with exacerbations of COPD (Table D.2.1).
2. **Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission**
   Rationale: Claims data are consistently available only for Medicare FFS beneficiaries. The 12-month prior enrollment criterion ensures that patients were Medicare FFS beneficiaries and that their comorbidities are captured from claims for risk adjustment. Medicare Part A is required at the time of admission to ensure no Medicare Advantage patients are included in the measure.
3. **Aged 65 or over**
   Rationale: Medicare patients younger than 65 usually qualify for the program due to severe disability. They are not included in the measure because they are considered to be too clinically distinct from Medicare patients 65 and over.
4. **Discharged alive from a non-federal short-term acute care hospital**
   Rationale: It is only possible for patients to be readmitted if they are discharged alive.
5. **Not transferred to another acute care facility**
   Rationale: Hospitalizations that result in a transfer to another acute care facility are not included in the measure because the measure's focus is on admissions that result in discharge to a non-acute care setting (for example, to home or a skilled nursing facility).

Exclusion Criteria for COPD Measure

1. **Without at least 30 days of post-discharge enrollment in Medicare FFS**
   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.
2. **Discharged against medical advice**
   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.
3. **COPD admissions within 30 days of discharge from a prior COPD index admission**
   Rationale: Additional COPD admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission is not considered both an index admission and a readmission for another index admission.

Table D.2.1 below outlines the ICD-10-CM codes used to define the COPD cohort for discharges on or after October 1, 2015. ICD-9 code lists for discharges prior to October 1, 2015 can be found in the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Table D.2.1 – ICD-10-CM Codes for COPD Cohort

ICD-10-CM Codes	Description
J41.8	Mixed simple and mucopurulent chronic bronchitis

ICD-10-CM Codes	Description
J42	Unspecified chronic bronchitis
J43.0	Unilateral pulmonary emphysema [MacLeod's syndrome]
J43.1	Panlobular emphysema
J43.2	Centrilobular emphysema
J43.8	Other emphysema
J43.9	Emphysema, unspecified
J44.0	Chronic obstructive pulmonary disease with acute lower respiratory infection
J44.1	Chronic obstructive pulmonary disease with (acute) exacerbation
J44.9	Chronic obstructive pulmonary disease, unspecified
Principal discharge diagnosis codes included in cohort if combined with a secondary diagnosis of J44.0 or J44.1	
J96.00	Acute respiratory failure, unspecified whether with hypoxia or hypercapnia
J96.01	Acute respiratory failure with hypoxia
J96.02	Acute respiratory failure with hypercapnia
J96.20	Acute and chronic respiratory failure, unspecified whether with hypoxia or hypercapnia
J96.21	Acute and chronic respiratory failure with hypoxia
J96.22	Acute and chronic respiratory failure with hypercapnia
J96.90	Respiratory failure, unspecified, unspecified whether with hypoxia or hypercapnia
J96.91	Respiratory failure, unspecified with hypoxia
J96.92	Respiratory failure, unspecified with hypercapnia
R09.2	Respiratory arrest

Risk Adjustment

The CCs outlined in Table D.2.2 below are used to identify risk variables in claims for discharges on or after October 1, 2015 as well as discharges prior to October 1, 2015.

The ICD-10 codes used to identify the History of mechanical ventilation and Sleep apnea risk variables in discharges on or after October 1, 2015 are posted on *QualityNet*; hyperlinks to these lists are provided in the table. For a list of ICD-9 codes used to identify these variables in discharges prior to October 1, 2015, please refer to the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Table D.2.2 – Risk Variables for COPD Measure

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
Age minus 65 (years above 65, continuous)	n/a	
History of mechanical ventilation	ICD-10-PCS code list	
Sleep apnea	ICD-10-CM code list	
Severe infection; other infectious diseases (CC 1, 3-7)	HIV/AIDS (CC 1)	
	Bacterial, fungal, and parasitic central nervous system infections (CC 3)	

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Viral and late effects central nervous system infections (CC 4)	
	Tuberculosis (CC 5)	
	Opportunistic infections (CC 6)	
	Other infectious diseases (CC 7)	X
Metastatic cancer and acute leukemia (CC 8)	Metastatic cancer and acute leukemia (CC 8)	
Lung and other severe cancers (CC 9)	Lung and other severe cancers (CC 9)	
Lymphatic, head and neck, brain, and other major cancers; breast, colorectal and other cancers and tumors; other respiratory and heart neoplasms (CC 10-13)	Lymphoma and other cancers (CC 10)	
	Colorectal, bladder, and other cancers (CC 11)	
	Breast, prostate, and other cancers and tumors (CC 12)	
	Other respiratory and heart neoplasms (CC 13)	
Other digestive and urinary neoplasms (CC 14)	Other digestive and urinary neoplasms (CC 14)	
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	Diabetes with acute complications (CC 17)	X
	Diabetes with chronic complications (CC 18)	
	Diabetes without complications (CC 19)	
	Proliferative diabetic retinopathy and vitreous hemorrhage (CC 122)	
	Diabetic and other vascular retinopathies (CC 123)	
Protein-calorie malnutrition (CC 21)	Protein-calorie malnutrition (CC 21)	
Morbid obesity; other endocrine/metabolic/nutritional disorders (CC 22, 25-26)	Morbid obesity (CC 22)	
	Disorders of lipoid metabolism (CC 25)	
	Other endocrine/metabolic/nutritional disorders (CC 26)	
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	Other significant endocrine and metabolic disorders (CC 23)	
	Disorders of fluid/electrolyte/acid-base balance (CC 24)	X
Chronic pancreatitis (CC 34)	Chronic pancreatitis (CC 34)	
Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	X
Other gastrointestinal disorders (CC 38)	Other gastrointestinal disorders (CC 38)	
Severe hematological disorders (CC 46)	Severe hematological disorders (CC 46)	
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	Iron deficiency or other/unspecified anemias and blood disease (CC 49)	
Dementia or other specified brain disorders (CC 51-53)	Dementia with complications (CC 51)	
	Dementia without complications (CC 52)	
	Nonpsychotic organic brain syndromes/conditions (CC 53)	
Drug/alcohol psychosis or dependence (CC 54-55)	Drug/alcohol psychosis (CC 54)	
	Drug/alcohol dependence (CC 55)	
Major psychiatric disorders (CC 57-59)	Schizophrenia (CC 57)	
	Major depressive, bipolar, and paranoid disorders (CC 58)	

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Reactive and unspecified psychosis (CC 59)	
Depression (CC 61)	Depression (CC 61)	
Anxiety disorders (CC 62)	Anxiety disorders (CC 62)	
Other psychiatric disorders (CC 63)	Other psychiatric disorders (CC 63)	
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	Quadriplegia (CC 70)	
	Paraplegia (CC 71)	
	Spinal cord disorders/injuries (CC 72)	
	Amyotrophic lateral sclerosis and other motor neuron disease (CC 73)	
	Cerebral palsy (CC 74)	
	Hemiplegia/hemiparesis (CC 103)	X
	Monoplegia, other paralytic syndromes (CC 104)	X
	Amputation status, lower limb/amputation complications (CC 189)	X
	Amputation status, upper limb (CC 190)	X
Polyneuropathy; other neuropathies (CC 75, 81)	Myasthenia gravis/myoneural disorders and Guillain-Barre syndrome/inflammatory and toxic neuropathy (CC 75)	
	Polyneuropathy, mononeuropathy, and other neurological conditions/injuries (CC 81)	
Respirator dependence/respiratory failure (CC 82-83)	Respirator dependence/tracheostomy status (CC 82)	X
	Respiratory arrest (CC 83)	X
Cardio-respiratory failure and shock	Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	X
Congestive heart failure (CC 85)	Congestive heart failure (CC 85)	X
Acute coronary syndrome (CC 86-87)	Acute myocardial infarction (CC 86)	X
	Unstable angina and other acute ischemic heart disease (CC 87)	X
Coronary atherosclerosis or angina (CC 88-89)	Angina pectoris (CC 88)	
	Coronary atherosclerosis/other chronic ischemic heart disease (CC 89)	
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	Specified heart arrhythmias (CC 96)	X
	Other heart rhythm and conduction disorders (CC 97)	X
Other and unspecified heart disease (CC 98)	Other and unspecified heart disease (CC 98)	
Stroke (CC 99-100)	Cerebral hemorrhage (CC 99)	X
	Ischemic or unspecified stroke (CC 100)	X
Vascular or circulatory disease (CC 106-109)	Atherosclerosis of the extremities with ulceration or gangrene (CC 106)	X
	Vascular disease with complications (CC 107)	X
	Vascular disease (CC 108)	X
	Other circulatory disease (CC 109)	X

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
Fibrosis of lung or other chronic lung disorders (CC 112)	Fibrosis of lung or other chronic lung disorders (CC 112)	
Pneumonia (CC 114-116)	Aspiration and specified bacterial pneumonias (CC 114)	X
	Pneumococcal pneumonia, empyema, lung abscess (CC 115)	X
	Viral and unspecified pneumonia, pleurisy (CC 116)	
Renal failure (CC 135-140)	Acute renal failure (CC 135)	X
	Chronic kidney disease, stage 5 (CC 136)	
	Chronic kidney disease, severe (stage 4) (CC 137)	
	Chronic kidney disease, moderate (stage 3) (CC 138)	
	Chronic kidney disease, mild or unspecified (stages 1-2 or unspecified) (CC 139)	
	Unspecified renal failure (CC 140)	X
Decubitus ulcer or chronic skin ulcer (CC 157-161)	Pressure ulcer of skin with necrosis through to muscle, tendon, or bone (CC 157)	X
	Pressure ulcer of skin with full thickness skin loss (CC 158)	X
	Pressure ulcer of skin with partial thickness skin loss (CC 159)	X
	Pressure pre-ulcer skin changes or unspecified stage (CC 160)	X
	Chronic ulcer of skin, except pressure (CC 161)	
Cellulitis, local skin infection (CC 164)	Cellulitis, local skin infection (CC 164)	X
Vertebral fractures without spinal cord injury (CC 169)	Vertebral fractures without spinal cord injury (CC 169)	

Outcome

Outcome Criteria for COPD Measure

Unplanned readmission, from any cause, within 30 days from the date of discharge from an index admission.

Rationale: Planned readmissions are generally not a signal of quality of care. Including planned readmissions in a readmission measure could create a disincentive to provide appropriate care to patients who are scheduled for elective or necessary procedures within 30 days of discharge. From a patient perspective, an unplanned readmission from any cause is an adverse event. Outcomes occurring within 30 days of discharge can be influenced by hospital care and the early transition to the non-acute care setting. The 30-day time frame is a clinically meaningful period for hospitals to collaborate with their communities to reduce readmissions.

Appendix D.3 Hospital-Level 30-Day RSRR following HF (NQF #0330)

Cohort

Inclusion Criteria for HF Measure

1. **Principal discharge diagnosis of HF**
   Rationale: HF is the condition targeted for measurement (Table D.3.1).
2. **Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission, or those who are VA beneficiaries**
   Rationale: Claims data are consistently available only for Medicare FFS and VA beneficiaries. For patients who are not VA beneficiaries, the 12-month prior enrollment criterion ensures that patients were Medicare FFS beneficiaries and that their comorbidities are captured from claims for risk adjustment. Medicare Part A is required at the time of admission to non-VA hospitals to ensure that no Medicare Advantage patients are included in the measure.
3. **Aged 65 or over**
   Rationale: Medicare patients younger than 65 usually qualify for the program due to severe disability. They are not included in the measure because they are considered to be too clinically distinct from Medicare patients 65 and over.
4. **Discharged alive from a non-federal short-term acute care hospital or VA hospital**
   Rationale: It is only possible for patients to be readmitted if they are discharged alive.
5. **Not transferred to another acute care facility**
   Rationale: Hospitalizations that result in a transfer to another acute care facility are not included in the measure because the measure's focus is on admissions that result in discharge to a non-acute care setting (for example, to home or a skilled nursing facility).

Exclusion Criteria for HF Measure

1. **Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries)**
   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.
2. **Discharged against medical advice**
   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.
3. **HF admissions within 30 days of discharge from a prior HF index admission**
   Rationale: Additional HF admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission is not considered both an index admission and a readmission for another index admission.
4. **With a procedure code for LVAD implantation or heart transplantation either during the index admission or in the 12 months prior to the index admission**
   Rationale: These patients represent a clinically distinct group (ICD-10-PCS code list).

Table D.3.1 below outlines the ICD-10-CM codes used to define the HF cohort for discharges on or after October 1, 2015. ICD-9 code lists for discharges prior to October 1, 2015 can be found in the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Table D.3.1 – ICD-10-CM Codes for Inclusion in HF Cohort

ICD-10-CM Codes	Description
I11.0	Hypertensive heart disease with heart failure
I13.0	Hypertensive heart and chronic kidney disease with heart failure and stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease
I13.2	Hypertensive heart and chronic kidney disease with heart failure and with stage 5 chronic kidney disease, or end stage renal disease
I50.1	Left ventricular failure
I50.20	Unspecified systolic (congestive) heart failure
I50.21	Acute systolic (congestive) heart failure
I50.22	Chronic systolic (congestive) heart failure
I50.23	Acute on chronic systolic (congestive) heart failure
I50.30	Unspecified diastolic (congestive) heart failure
I50.31	Acute diastolic (congestive) heart failure
I50.32	Chronic diastolic (congestive) heart failure
I50.33	Acute on chronic diastolic (congestive) heart failure
I50.40	Unspecified combined systolic (congestive) and diastolic (congestive) heart failure
I50.41	Acute combined systolic (congestive) and diastolic (congestive) heart failure
I50.42	Chronic combined systolic (congestive) and diastolic (congestive) heart failure
I50.43	Acute on chronic combined systolic (congestive) and diastolic (congestive) heart failure
I50.9	Heart failure, unspecified

Risk Adjustment

The CCs outlined in Table D.3.2 below are used to identify risk variables in claims for discharges on or after October 1, 2015 as well as discharges prior to October 1, 2015.

The ICD-10 codes used to identify History of CABG surgery in discharges on or after October 1, 2015 are posted on *QualityNet*; a hyperlink to this list is provided in the table. For a list of ICD-9 codes used to identify this variable in discharges prior to October 1, 2015, please refer to the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Table D.3.2 – Risk Variables for HF Measure

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
Age minus 65 (years above 65, continuous)	n/a	
Male	n/a	
History of coronary artery bypass graft (CABG) surgery	ICD-10-CM code list and ICD-10-PCS code list	
Metastatic cancer and acute leukemia (CC 8)	Metastatic cancer and acute leukemia (CC 8)	
Cancer (CC 9-14)	Lung and other severe cancers (CC 9)	
	Lymphoma and other cancers (CC 10)	

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Colorectal, bladder, and other cancers (CC 11)	
	Breast, prostate, and other cancers and tumors (CC 12)	
	Other respiratory and heart neoplasms (CC 13)	
	Other digestive and urinary neoplasms (CC 14)	
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	Diabetes with acute complications (CC 17)	X
	Diabetes with chronic complications (CC 18)	
	Diabetes without complications (CC 19)	
	Proliferative diabetic retinopathy and vitreous hemorrhage (CC 122)	
	Diabetic and other vascular retinopathies (CC 123)	
Protein-calorie malnutrition (CC 21)	Protein-calorie malnutrition (CC 21)	
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	Other significant endocrine and metabolic disorders (CC 23)	
	Disorders of fluid/electrolyte/acid-base balance (CC 24)	X
Liver or biliary disease (CC 27-32)	End-stage liver disease (CC 27)	
	Cirrhosis of liver (CC 28)	
	Chronic hepatitis (CC 29)	
	Acute liver failure/disease (CC 30)	X
	Other hepatitis and liver disease (CC 31)	
	Gallbladder and biliary tract disorders (CC 32)	
Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	Peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 36)	X
Other gastrointestinal disorders (CC 38)	Other gastrointestinal disorders (CC 38)	
Severe hematological disorders (CC 46)	Severe hematological disorders (CC 46)	
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	Iron deficiency or other/unspecified anemias and blood disease (CC 49)	
Dementia or other specified brain disorders (CC 51-53)	Dementia with complications (CC 51)	
	Dementia without complications (CC 52)	
	Nonpsychotic organic brain syndromes/conditions (CC 53)	
Drug/alcohol abuse/dependence/psychosis (CC 54-56)	Drug/alcohol psychosis (CC 54)	
	Drug/alcohol dependence (CC 55)	
	Drug/alcohol abuse, without dependence (CC 56)	
Major psychiatric disorders (CC 57-59)	Schizophrenia (CC 57)	
	Major depressive, bipolar, and paranoid disorders (CC 58)	
	Reactive and unspecified psychosis (CC 59)	
Depression (CC 61)	Depression (CC 61)	
Other psychiatric disorders (CC 63)	Other psychiatric disorders (CC 63)	
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	Quadriplegia (CC 70)	
	Paraplegia (CC 71)	

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Spinal cord disorders/injuries (CC 72)	
	Amyotrophic lateral sclerosis and other motor neuron disease (CC 73)	
	Cerebral palsy (CC 74)	
	Hemiplegia/hemiparesis (CC 103)	X
	Monoplegia, other paralytic syndromes (CC 104)	X
	Amputation status, lower limb/amputation complications (CC 189)	X
	Amputation status, upper limb (CC 190)	X
Cardio-respiratory failure and shock	Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	X
Congestive heart failure (CC 85)	Congestive heart failure (CC 85)	X
Acute coronary syndrome (CC 86-87)	Acute myocardial infarction (CC 86)	X
	Unstable angina and other acute ischemic heart disease (CC 87)	X
Coronary atherosclerosis or angina (CC 88-89)	Angina pectoris (CC 88)	
	Coronary atherosclerosis/other chronic ischemic heart disease (CC 89)	
Valvular and rheumatic heart disease (CC 91)	Valvular and rheumatic heart disease (CC 91)	
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	Specified heart arrhythmias (CC 96)	X
	Other heart rhythm and conduction disorders (CC 97)	X
Other and unspecified heart disease (CC 98)	Other and unspecified heart disease (CC 98)	
Stroke (CC 99-100)	Cerebral hemorrhage (CC 99)	X
	Ischemic or unspecified stroke (CC 100)	X
Vascular or circulatory disease (CC 106-109)	Atherosclerosis of the extremities with ulceration or gangrene (CC 106)	X
	Vascular disease with complications (CC 107)	X
	Vascular disease (CC 108)	X
	Other circulatory disease (CC 109)	X
Chronic obstructive pulmonary disease (COPD) (CC 111)	Chronic obstructive pulmonary disease (COPD) (CC 111)	
Fibrosis of lung or other chronic lung disorders (CC 112)	Fibrosis of lung or other chronic lung disorders (CC 112)	
Asthma (CC 113)	Asthma (CC 113)	
Pneumonia (CC 114-116)	Aspiration and specified bacterial pneumonias (CC 114)	X
	Pneumococcal pneumonia, empyema, lung abscess (CC 115)	X
	Viral and unspecified pneumonia, pleurisy (CC 116)	
Dialysis status (CC 134)	Dialysis status (CC 134)	X
Renal failure (CC 135-140)	Acute renal failure (CC 135)	X

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Chronic kidney disease, stage 5 (CC 136)	
	Chronic kidney disease, severe (stage 4) (CC 137)	
	Chronic kidney disease, moderate (stage 3) (CC 138)	
	Chronic kidney disease, mild or unspecified (stages 1-2 or unspecified) (CC 139)	
	Unspecified renal failure (CC 140)	X
Nephritis (CC 141)	Nephritis (CC 141)	X
Other urinary tract disorders (CC 145)	Other urinary tract disorders (CC 145)	
Decubitus ulcer or chronic skin ulcer (CC 157-161)	Pressure ulcer of skin with necrosis through to muscle, tendon, or bone (CC 157)	X
	Pressure ulcer of skin with full thickness skin loss (CC 158)	X
	Pressure ulcer of skin with partial thickness skin loss (CC 159)	X
	Pressure pre-ulcer skin changes or unspecified stage (CC 160)	X
	Chronic ulcer of skin, except pressure (CC 161)	

Outcome

Outcome Criteria for HF Measure

Unplanned readmission, from any cause, within 30 days from the date of discharge from an index admission.

Rationale: Planned readmissions are generally not a signal of quality of care. Including planned readmissions in a readmission measure could create a disincentive to provide appropriate care to patients who are scheduled for elective or necessary procedures within 30 days of discharge. From a patient perspective, an unplanned readmission from any cause is an adverse event. Outcomes occurring within 30 days of discharge can be influenced by hospital care and the early transition to the non-acute care setting. The 30-day time frame is a clinically meaningful period for hospitals to collaborate with their communities to reduce readmissions.

Appendix D.4 Hospital-Level 30-Day RSRR following Pneumonia (NQF #0506)

Cohort

Inclusion Criteria for Pneumonia Measure

1. **Principal discharge diagnosis of:**
   - **Pneumonia; or,**
   - **Sepsis (not including severe sepsis) with a secondary diagnosis of pneumonia coded as POA and no secondary diagnosis of severe sepsis coded as POA**
     Rationale: Pneumonia is the condition targeted for measurement. Sepsis admissions with a secondary diagnosis of pneumonia, as described above, are also included in order for the measure to more fully reflect the population of Medicare FFS beneficiaries being treated for pneumonia (Table D.4.1).
2. **Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission, or those who are VA beneficiaries**
   Rationale: Claims data are consistently available only for Medicare FFS and VA beneficiaries. For patients who are not VA beneficiaries, the 12-month prior enrollment criterion ensures that patients were Medicare FFS beneficiaries and that their comorbidities are captured from claims for risk adjustment. Medicare Part A is required at the time of admission to non-VA hospitals to ensure that no Medicare Advantage patients are included in the measure.
3. **Aged 65 or over**
   Rationale: Medicare patients younger than 65 usually qualify for the program due to severe disability. They are not included in the measure because they are considered to be too clinically distinct from Medicare patients 65 and over.
4. **Discharged alive from a non-federal short-term acute care hospital or VA hospital**
   Rationale: It is only possible for patients to be readmitted if they are discharged alive.
5. **Not transferred to another acute care facility**
   Rationale: Hospitalizations that result in a transfer to another acute care facility are not included in the measure because the measure's focus is on admissions that result in discharge to a non-acute care setting (for example, to home or a skilled nursing facility).

Exclusion Criteria for Pneumonia Measure

1. **Without at least 30 days of post-discharge enrollment in Medicare FFS (in the case of patients who are not VA beneficiaries)**
   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.
2. **Discharged against medical advice**
   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.
3. **Pneumonia admissions within 30 days of discharge from a prior pneumonia index admission**
   Rationale: Additional pneumonia admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission is not considered both an index admission and a readmission for another index admission.

Table D.4.1 below outlines the ICD-10-CM codes used to define the pneumonia cohort for discharges on or after October 1, 2015. ICD-9 code lists for discharges prior to October 1, 2015 can be found in the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Table D.4.1 – ICD-10-CM Codes for Pneumonia Cohort

ICD-10-CM Codes	Description
A48.1	Legionnaires' disease
J10.00	Influenza due to other identified influenza virus with unspecified type of pneumonia
J10.01	Influenza due to other identified influenza virus with the same other identified influenza virus pneumonia
J10.08	Influenza due to other identified influenza virus with other specified pneumonia
J11.00	Influenza due to unidentified influenza virus with unspecified type of pneumonia
J11.08	Influenza due to unidentified influenza virus with specified pneumonia
J12.0	Adenoviral pneumonia
J12.1	Respiratory syncytial virus pneumonia
J12.2	Parainfluenza virus pneumonia
J12.3	Human metapneumovirus pneumonia
J12.81	Pneumonia due to SARS-associated coronavirus
J12.89	Other viral pneumonia
J12.9	Viral pneumonia, unspecified
J13	Pneumonia due to Streptococcus pneumoniae
J14	Pneumonia due to Hemophilus influenzae
J15.0	Pneumonia due to Klebsiella pneumoniae
J15.1	Pneumonia due to Pseudomonas
J15.20	Pneumonia due to staphylococcus, unspecified
J15.211	Pneumonia due to Methicillin susceptible Staphylococcus aureus
J15.212	Pneumonia due to Methicillin resistant Staphylococcus aureus
J15.29	Pneumonia due to other staphylococcus
J15.3	Pneumonia due to streptococcus, group B
J15.4	Pneumonia due to other streptococci
J15.5	Pneumonia due to Escherichia coli
J15.6	Pneumonia due to other aerobic Gram-negative bacteria
J15.7	Pneumonia due to Mycoplasma pneumoniae
J15.8	Pneumonia due to other specified bacteria
J15.9	Unspecified bacterial pneumonia
J16.0	Chlamydial pneumonia
J16.8	Pneumonia due to other specified infectious organisms
J18.0	Bronchopneumonia, unspecified organism
J18.1	Lobar pneumonia, unspecified organism
J18.8	Other pneumonia, unspecified organism
J18.9	Pneumonia, unspecified organism
J69.0	Pneumonitis due to inhalation of food and vomit
Principal discharge diagnosis codes included in cohort if combined with a secondary diagnosis of pneumonia coded as POA AND no secondary diagnosis of severe sepsis (R65.20 Severe sepsis without septic shock or R65.21 Severe sepsis with septic shock) coded as POA is present	
A02.1	Salmonella sepsis
A22.7	Anthrax sepsis

ICD-10-CM Codes	Description
A26.7	Erysipelothrix sepsis
A32.7	Listerial sepsis
A40.0	Sepsis due to streptococcus, group A
A40.1	Sepsis due to streptococcus, group B
A40.3	Sepsis due to Streptococcus pneumoniae
A40.8	Other streptococcal sepsis
A40.9	Streptococcal sepsis, unspecified
A41.01	Sepsis due to Methicillin susceptible Staphylococcus aureus
A41.02	Sepsis due to Methicillin resistant Staphylococcus aureus
A41.1	Sepsis due to other specified staphylococcus
A41.2	Sepsis due to unspecified staphylococcus
A41.3	Sepsis due to Hemophilus influenzae
A41.4	Sepsis due to anaerobes
A41.50	Gram-negative sepsis, unspecified
A41.51	Sepsis due to Escherichia coli [E. coli]
A41.52	Sepsis due to Pseudomonas
A41.53	Sepsis due to Serratia
A41.59	Other Gram-negative sepsis
A41.81	Sepsis due to Enterococcus
A41.89	Other specified sepsis
A41.9	Sepsis, unspecified organism
A42.7	Actinomycotic sepsis
A54.86	Gonococcal sepsis
B37.7	Candidal sepsis

Risk Adjustment

The CCs outlined in Table D.4.2 below are used to identify risk variables in claims for discharges on or after October 1, 2015 as well as discharges prior to October 1, 2015.

The ICD-10 codes listed used to identify History of CABG surgery in discharges on or after October 1, 2015 are posted on *QualityNet*; a hyperlink to this list is provided in the table. For a list of ICD-9 codes used to identify this variable in discharges prior to October 1, 2015, please refer to the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Table D.4.2 – Risk Variables for Pneumonia Measure

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
Age minus 65 (years above 65, continuous)	n/a	
Male	n/a	
History of coronary artery bypass graft (CABG) surgery	ICD-10-CM code list and ICD-10-PCS code list	
Severe infection; other infectious diseases (CC 1, 3-7)	HIV/AIDS (CC 1)	
	Bacterial, fungal, and parasitic central nervous system infections (CC 3)	
	Viral and late effects central nervous system infections (CC 4)	

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Tuberculosis (CC 5)	
	Opportunistic infections (CC 6)	
	Other infectious diseases (CC 7)	X
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	X
Metastatic cancer and acute leukemia (CC 8)	Metastatic cancer and acute leukemia (CC 8)	
Lung and other severe cancers (CC 9)	Lung and other severe cancers (CC 9)	
Lymphoma; other cancers (CC 10-12)	Lymphoma and other cancers (CC 10)	
	Colorectal, bladder, and other cancers (CC 11)	
	Breast, prostate, and other cancers and tumors (CC 12)	
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	Diabetes with acute complications (CC 17)	X
	Diabetes with chronic complications (CC 18)	
	Diabetes without complications (CC 19)	
	Proliferative diabetic retinopathy and vitreous hemorrhage (CC 122)	
	Diabetic and other vascular retinopathies (CC 123)	
Protein-calorie malnutrition (CC 21)	Protein-calorie malnutrition (CC 21)	
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	Other significant endocrine and metabolic disorders (CC 23)	
	Disorders of fluid/electrolyte/acid-base balance (CC 24)	X
Other gastrointestinal disorders (CC 38)	Other gastrointestinal disorders (CC 38)	
Severe hematological disorders (CC 46)	Severe hematological disorders (CC 46)	
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	Iron deficiency or other/unspecified anemias and blood disease (CC 49)	
Dementia or other specified brain disorders (CC 51-53)	Dementia with complications (CC 51)	
	Dementia without complications (CC 52)	
	Nonpsychotic organic brain syndromes/conditions (CC 53)	
Drug/alcohol abuse/dependence/psychosis (CC 54-56)	Drug/alcohol psychosis (CC 54)	
	Drug/alcohol dependence (CC 55)	
	Drug/alcohol abuse, without dependence (CC 56)	
Major psychiatric disorders (CC 57-59)	Schizophrenia (CC 57)	
	Major depressive, bipolar, and paranoid disorders (CC 58)	
	Reactive and unspecified psychosis (CC 59)	
Other psychiatric disorders (CC 63)	Other psychiatric disorders (CC 63)	
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	Quadriplegia (CC 70)	
	Paraplegia (CC 71)	
	Spinal cord disorders/injuries (CC 72)	
	Amyotrophic lateral sclerosis and other motor neuron disease (CC 73)	
	Cerebral palsy (CC 74)	
	Hemiplegia/hemiparesis (CC 103)	X

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Monoplegia, other paralytic syndromes (CC 104)	X
	Amputation status, lower limb/amputation complications (CC 189)	X
	Amputation status, upper limb (CC 190)	X
Respirator dependence/tracheostomy status (CC 82)	Respirator dependence/tracheostomy status (CC 82)	X
Respiratory arrest; cardio-respiratory failure and shock	Respiratory arrest (CC 83)	X
	Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	X
Congestive heart failure (CC 85)	Congestive heart failure (CC 85)	X
Acute coronary syndrome (CC 86-87)	Acute myocardial infarction (CC 86)	X
	Unstable angina and other acute ischemic heart disease (CC 87)	X
Coronary atherosclerosis or angina (CC 88-89)	Angina pectoris (CC 88)	
	Coronary atherosclerosis/other chronic ischemic heart disease (CC 89)	
Valvular and rheumatic heart disease (CC 91)	Valvular and rheumatic heart disease (CC 91)	
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	Specified heart arrhythmias (CC 96)	X
	Other heart rhythm and conduction disorders (CC 97)	X
Stroke (CC 99-100)	Cerebral hemorrhage (CC 99)	X
	Ischemic or unspecified stroke (CC 100)	X
Vascular or circulatory disease (CC 106-109)	Atherosclerosis of the extremities with ulceration or gangrene (CC 106)	X
	Vascular disease with complications (CC 107)	X
	Vascular disease (CC 108)	X
	Other circulatory disease (CC 109)	X
Chronic obstructive pulmonary disease (COPD) (CC 111)	Chronic obstructive pulmonary disease (COPD) (CC 111)	
Fibrosis of lung or other chronic lung disorders (CC 112)	Fibrosis of lung or other chronic lung disorders (CC 112)	
Asthma (CC 113)	Asthma (CC 113)	
Pneumonia (CC 114-116)	Aspiration and specified bacterial pneumonias (CC 114)	X
	Pneumococcal pneumonia, empyema, lung abscess (CC 115)	X
	Viral and unspecified pneumonia, pleurisy (CC 116)	X
Pleural effusion/pneumothorax (CC 117)	Pleural effusion/pneumothorax (CC 117)	X
Other respiratory disorders (CC 118)	Other respiratory disorders (CC 118)	
Dialysis status (CC 134)	Dialysis status (CC 134)	X
Renal failure (CC 135-140)	Acute renal failure (CC 135)	X
	Chronic kidney disease, stage 5 (CC 136)	

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Chronic kidney disease, severe (stage 4) (CC 137)	
	Chronic kidney disease, moderate (stage 3) (CC 138)	
	Chronic kidney disease, mild or unspecified (stages 1-2 or unspecified) (CC 139)	
	Unspecified renal failure (CC 140)	X
Urinary tract infection (CC 144)	Urinary tract infection (CC 144)	X
Other urinary tract disorders (CC 145)	Other urinary tract disorders (CC 145)	
Decubitus ulcer or chronic skin ulcer (CC 157-161)	Pressure ulcer of skin with necrosis through to muscle, tendon, or bone (CC 157)	X
	Pressure ulcer of skin with full thickness skin loss (CC 158)	X
	Pressure ulcer of skin with partial thickness skin loss (CC 159)	X
	Pressure pre-ulcer skin changes or unspecified stage (CC 160)	X
	Chronic ulcer of skin, except pressure (CC 161)	
Vertebral fractures without spinal cord injury (CC 169)	Vertebral fractures without spinal cord injury (CC 169)	
Other injuries (CC 174)	Other injuries (CC 174)	

Outcome

Outcome Criteria for Pneumonia Measure

Unplanned readmission, from any cause, within 30 days from the date of discharge from an index admission.

Rationale: Planned readmissions are generally not a signal of quality of care. Including planned readmissions in a readmission measure could create a disincentive to provide appropriate care to patients who are scheduled for elective or necessary procedures within 30 days of discharge. From a patient perspective, an unplanned readmission from any cause is an adverse event. Outcomes occurring within 30 days of discharge can be influenced by hospital care and the early transition to the non-acute care setting. The 30-day time frame is a clinically meaningful period for hospitals to collaborate with their communities to reduce readmissions.

Appendix D.5 Hospital-Level 30-Day RSRR following Ischemic Stroke

Cohort

Inclusion Criteria for Stroke Measure

1. **Principal discharge diagnosis of ischemic stroke**
   Rationale: Ischemic stroke is the condition targeted for measurement (Table D.5.1). Hemorrhagic strokes are not included in the cohort. Ischemic strokes are the most common type of stroke, accounting for the vast majority of stroke hospitalizations. Additionally, the causes, prognosis, and treatment of ischemic stroke are quite different than those of hemorrhagic stroke. Combining ischemic and hemorrhagic stroke patients could make it more difficult to account for a hospital's patient case mix.
2. **Enrolled in Medicare FFS Part A and Part B for the 12 months prior to the date of admission and Part A during the index admission**
   Rationale: Currently claims-data are consistently available only for Medicare FFS beneficiaries. The 12-month prior enrollment criterion ensures that patients were Medicare FFS beneficiaries and that their comorbidities are captured from claims for risk adjustment. Medicare Part A is required at the time of admission to ensure no Medicare Advantage patients are included in the measure.
3. **Aged 65 or over**
   Rationale: Medicare patients younger than 65 usually qualify for the program due to severe disability. They are not included in the measure because they are considered to be too clinically distinct from Medicare patients 65 and over.
4. **Discharged alive from a non-federal short-term acute care hospital**
   Rationale: It is only possible for patients to be readmitted if they are discharged alive.
5. **Not transferred to another acute care facility**
   Rationale: Hospitalizations that result in a transfer to another acute care facility are not included in the measure because the measure's focus is on admissions that result in discharge to a non-acute care setting (for example, to home or a skilled nursing facility).

Exclusion Criteria for Stroke Measure

1. **Without at least 30 days of post-discharge enrollment in Medicare FFS**
   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.
2. **Discharged against medical advice**
   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.
3. **Stroke admissions within 30 days of discharge from a prior stroke index admission**
   Rationale: Additional stroke admissions within 30 days are excluded as index admissions because they are part of the outcome. A single admission is not considered both an index admission and a readmission for another index admission.

Table D.5.1 below outlines the ICD-10-CM codes used to define the ischemic stroke cohort for discharges on or after October 1, 2015. ICD-9 code lists for discharges prior to October 1, 2015 can be found in the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet*.

Table D.5.1 – ICD-10-CM Codes for Ischemic Stroke Cohort

ICD-10-CM Codes	Description
I63.00	Cerebral infarction due to thrombosis of unspecified precerebral artery
I63.011	Cerebral infarction due to thrombosis of right vertebral artery
I63.012	Cerebral infarction due to thrombosis of left vertebral artery
I63.013	Cerebral infarction due to thrombosis of bilateral vertebral arteries
I63.019	Cerebral infarction due to thrombosis of unspecified vertebral artery
I63.02	Cerebral infarction due to thrombosis of basilar artery
I63.031	Cerebral infarction due to thrombosis of right carotid artery
I63.032	Cerebral infarction due to thrombosis of left carotid artery
I63.033	Cerebral infarction due to thrombosis of bilateral carotid arteries
I63.039	Cerebral infarction due to thrombosis of unspecified carotid artery
I63.09	Cerebral infarction due to thrombosis of other precerebral artery
I63.10	Cerebral infarction due to embolism of unspecified precerebral artery
I63.111	Cerebral infarction due to embolism of right vertebral artery
I63.112	Cerebral infarction due to embolism of left vertebral artery
I63.113	Cerebral infarction due to embolism of bilateral vertebral arteries
I63.119	Cerebral infarction due to embolism of unspecified vertebral artery
I63.12	Cerebral infarction due to embolism of basilar artery
I63.131	Cerebral infarction due to embolism of right carotid artery
I63.132	Cerebral infarction due to embolism of left carotid artery
I63.133	Cerebral infarction due to embolism of bilateral carotid arteries
I63.139	Cerebral infarction due to embolism of unspecified carotid artery
I63.19	Cerebral infarction due to embolism of other precerebral artery
I63.20	Cerebral infarction due to unspecified occlusion or stenosis of unspecified precerebral arteries
I63.211	Cerebral infarction due to unspecified occlusion or stenosis of right vertebral arteries
I63.212	Cerebral infarction due to unspecified occlusion or stenosis of left vertebral arteries
I63.213	Cerebral infarction due to unspecified occlusion or stenosis of bilateral vertebral arteries
I63.219	Cerebral infarction due to unspecified occlusion or stenosis of unspecified vertebral arteries
I63.22	Cerebral infarction due to unspecified occlusion or stenosis of basilar arteries
I63.231	Cerebral infarction due to unspecified occlusion or stenosis of right carotid arteries
I63.232	Cerebral infarction due to unspecified occlusion or stenosis of left carotid arteries
I63.233	Cerebral infarction due to unspecified occlusion or stenosis of bilateral carotid arteries
I63.239	Cerebral infarction due to unspecified occlusion or stenosis of unspecified carotid arteries
I63.29	Cerebral infarction due to unspecified occlusion or stenosis of other precerebral arteries
I63.30	Cerebral infarction due to thrombosis of unspecified cerebral artery
I63.311	Cerebral infarction due to thrombosis of right middle cerebral artery
I63.312	Cerebral infarction due to thrombosis of left middle cerebral artery

ICD-10-CM Codes	Description
I63.313	Cerebral infarction due to thrombosis of bilateral middle cerebral arteries
I63.319	Cerebral infarction due to thrombosis of unspecified middle cerebral artery
I63.321	Cerebral infarction due to thrombosis of right anterior cerebral artery
I63.322	Cerebral infarction due to thrombosis of left anterior cerebral artery
I63.323	Cerebral infarction due to thrombosis of bilateral anterior arteries
I63.329	Cerebral infarction due to thrombosis of unspecified anterior cerebral artery
I63.331	Cerebral infarction due to thrombosis of right posterior cerebral artery
I63.332	Cerebral infarction due to thrombosis of left posterior cerebral artery
I63.333	Cerebral infarction to thrombosis of bilateral posterior arteries
I63.339	Cerebral infarction due to thrombosis of unspecified posterior cerebral artery
I63.341	Cerebral infarction due to thrombosis of right cerebellar artery
I63.342	Cerebral infarction due to thrombosis of left cerebellar artery
I63.343	Cerebral infarction to thrombosis of bilateral cerebellar arteries
I63.349	Cerebral infarction due to thrombosis of unspecified cerebellar artery
I63.39	Cerebral infarction due to thrombosis of other cerebral artery
I63.40	Cerebral infarction due to embolism of unspecified cerebral artery
I63.411	Cerebral infarction due to embolism of right middle cerebral artery
I63.412	Cerebral infarction due to embolism of left middle cerebral artery
I63.413	Cerebral infarction due to embolism of bilateral middle cerebral arteries
I63.419	Cerebral infarction due to embolism of unspecified middle cerebral artery
I63.421	Cerebral infarction due to embolism of right anterior cerebral artery
I63.422	Cerebral infarction due to embolism of left anterior cerebral artery
I63.423	Cerebral infarction due to embolism of bilateral anterior cerebral arteries
I63.429	Cerebral infarction due to embolism of unspecified anterior cerebral artery
I63.431	Cerebral infarction due to embolism of right posterior cerebral artery
I63.432	Cerebral infarction due to embolism of left posterior cerebral artery
I63.433	Cerebral infarction due to embolism of bilateral posterior cerebral arteries
I63.439	Cerebral infarction due to embolism of unspecified posterior cerebral artery
I63.441	Cerebral infarction due to embolism of right cerebellar artery
I63.442	Cerebral infarction due to embolism of left cerebellar artery
I63.443	Cerebral infarction due to embolism of bilateral cerebellar arteries
I63.449	Cerebral infarction due to embolism of unspecified cerebellar artery
I63.49	Cerebral infarction due to embolism of other cerebral artery
I63.50	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebral artery
I63.511	Cerebral infarction due to unspecified occlusion or stenosis of right middle cerebral artery
I63.512	Cerebral infarction due to unspecified occlusion or stenosis of left middle cerebral artery

ICD-10-CM Codes	Description
I63.513	Cerebral infarction due to unspecified occlusion or stenosis of bilateral middle arteries
I63.519	Cerebral infarction due to unspecified occlusion or stenosis of unspecified middle cerebral artery
I63.521	Cerebral infarction due to unspecified occlusion or stenosis of right anterior cerebral artery
I63.522	Cerebral infarction due to unspecified occlusion or stenosis of left anterior cerebral artery
I63.523	Cerebral infarction due to unspecified occlusion or stenosis of bilateral anterior arteries
I63.529	Cerebral infarction due to unspecified occlusion or stenosis of unspecified anterior cerebral artery
I63.531	Cerebral infarction due to unspecified occlusion or stenosis of right posterior cerebral artery
I63.532	Cerebral infarction due to unspecified occlusion or stenosis of left posterior cerebral artery
I63.533	Cerebral infarction due to unspecified occlusion or stenosis of bilateral posterior arteries
I63.539	Cerebral infarction due to unspecified occlusion or stenosis of unspecified posterior cerebral artery
I63.541	Cerebral infarction due to unspecified occlusion or stenosis of right cerebellar artery
I63.542	Cerebral infarction due to unspecified occlusion or stenosis of left cerebellar artery
I63.543	Cerebral infarction due to unspecified occlusion or stenosis of bilateral cerebellar arteries
I63.549	Cerebral infarction due to unspecified occlusion or stenosis of unspecified cerebellar artery
I63.59	Cerebral infarction due to unspecified occlusion or stenosis of other cerebral artery
I63.6	Cerebral infarction due to cerebral venous thrombosis, nonpyogenic
I63.8	Other cerebral infarction
I63.9	Cerebral infarction, unspecified
I67.89	Other cerebrovascular disease

Risk Adjustment

The CCs outlined in Table D.5.2 below are used to identify risk variables in claims for discharges on or after October 1, 2015 as well as discharges prior to October 1, 2015.

Table D.5.2 – Risk Variables for Stroke Measure

Description of Risk Variable	CCs Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
Age minus 65 (years above 65, continuous)	n/a	
Male	n/a	
Metastatic cancer and acute leukemia (CC 8)	Metastatic cancer and acute leukemia (CC 8)	
Cancer (CC 9-14)	Lung and other severe cancers (CC 9)	
	Lymphoma and other cancers (CC 10)	

Description of Risk Variable	CCs Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Colorectal, bladder, and other cancers (CC 11)	
	Breast, prostate, and other cancers and tumors (CC 12)	
	Other respiratory and heart neoplasms (CC 13)	
	Other digestive and urinary neoplasms (CC 14)	
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	Diabetes with acute complications (CC 17)	X
	Diabetes with chronic complications (CC 18)	
	Diabetes without complications (CC 19)	
	Proliferative diabetic retinopathy and vitreous hemorrhage (CC 122)	
	Diabetic and other vascular retinopathies (CC 123)	
Protein-calorie malnutrition (CC 21)	Protein-calorie malnutrition (CC 21)	
Morbid obesity; other endocrine/metabolic/nutritional disorders (CC 22, 25-26)	Morbid obesity (CC 22)	
	Disorders of lipoid metabolism (CC 25)	
	Other endocrine/metabolic/nutritional disorders (CC 26)	
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	Other significant endocrine and metabolic disorders (CC 23)	
	Disorders of fluid/electrolyte/acid-base balance (CC 24)	X
Severe hematological disorders (CC 46)	Severe hematological disorders (CC 46)	
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	Iron deficiency or other/unspecified anemias and blood disease (CC 49)	
Dementia or other specified brain disorders (CC 51-53)	Dementia with complications (CC 51)	
	Dementia without complications (CC 52)	
	Nonpsychotic organic brain syndromes/conditions (CC 53)	
Quadriplegia, paraplegia, functional disability (CC 70-73, 189-190)	Quadriplegia (CC 70)	
	Paraplegia (CC 71)	
	Spinal cord disorders/injuries (CC 72)	
	Amyotrophic lateral sclerosis and other motor neuron disease (CC 73)	
	Amputation status, lower limb/amputation complications (CC 189)	X
	Amputation status, upper limb (CC 190)	X
Hemiplegia, paralysis, functional disability (CC 74, 103-105)	Cerebral palsy (CC 74)	
	Hemiplegia/hemiparesis (CC 103)	X
	Monoplegia, other paralytic syndromes (CC 104)	X
	Late effects of cerebrovascular disease, except paralysis (CC 105)	
Seizure disorders and convulsions (CC 79)	Seizure disorders and convulsions (CC 79)	
Congestive heart failure (CC 85)	Congestive heart failure (CC 85)	X
Hypertensive heart disease (CC 94)	Hypertensive heart disease (CC 94)	

Description of Risk Variable	CCs Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
Cerebral hemorrhage (CC 99)	Cerebral hemorrhage (CC 99)	X
Ischemic or unspecified stroke (CC 100)	Ischemic or unspecified stroke (CC 100)	X
Precerebral arterial occlusion and transient cerebral ischemia (CC 101)	Precerebral arterial occlusion and transient cerebral ischemia (CC 101)	X
Vascular or circulatory disease (CC 106-109)	Atherosclerosis of the extremities with ulceration or gangrene (CC 106)	X
	Vascular disease with complications (CC 107)	X
	Vascular disease (CC 108)	X
	Other circulatory disease (CC 109)	X
Chronic obstructive pulmonary disease (COPD) (CC 111)	Chronic obstructive pulmonary disease (COPD) (CC 111)	
Other respiratory disorders (CC 118)	Other respiratory disorders (CC 118)	
Dialysis status (CC 134)	Dialysis status (CC 134)	X
Renal failure (CC 135-140)	Acute renal failure (CC 135)	X
	Chronic kidney disease, stage 5 (CC 136)	
	Chronic kidney disease, severe (stage 4) (CC 137)	
	Chronic kidney disease, moderate (stage 3) (CC 138)	
	Chronic kidney disease, mild or unspecified (stages 1-2 or unspecified) (CC 139)	
	Unspecified renal failure (CC 140)	X
Other urinary tract disorders (CC 145)	Other urinary tract disorders (CC 145)	
Decubitus ulcer or chronic skin ulcer (CC 157-161)	Pressure ulcer of skin with necrosis through to muscle, tendon, or bone (CC 157)	X
	Pressure ulcer of skin with full thickness skin loss (CC 158)	X
	Pressure ulcer of skin with partial thickness skin loss (CC 159)	X
	Pressure pre-ulcer skin changes or unspecified stage (CC 160)	X
	Chronic ulcer of skin, except pressure (CC 161)	
Major symptoms, abnormalities (CC 178)	Major symptoms, abnormalities (CC 178)	X

Outcome

Outcome Criteria for Stroke Measure

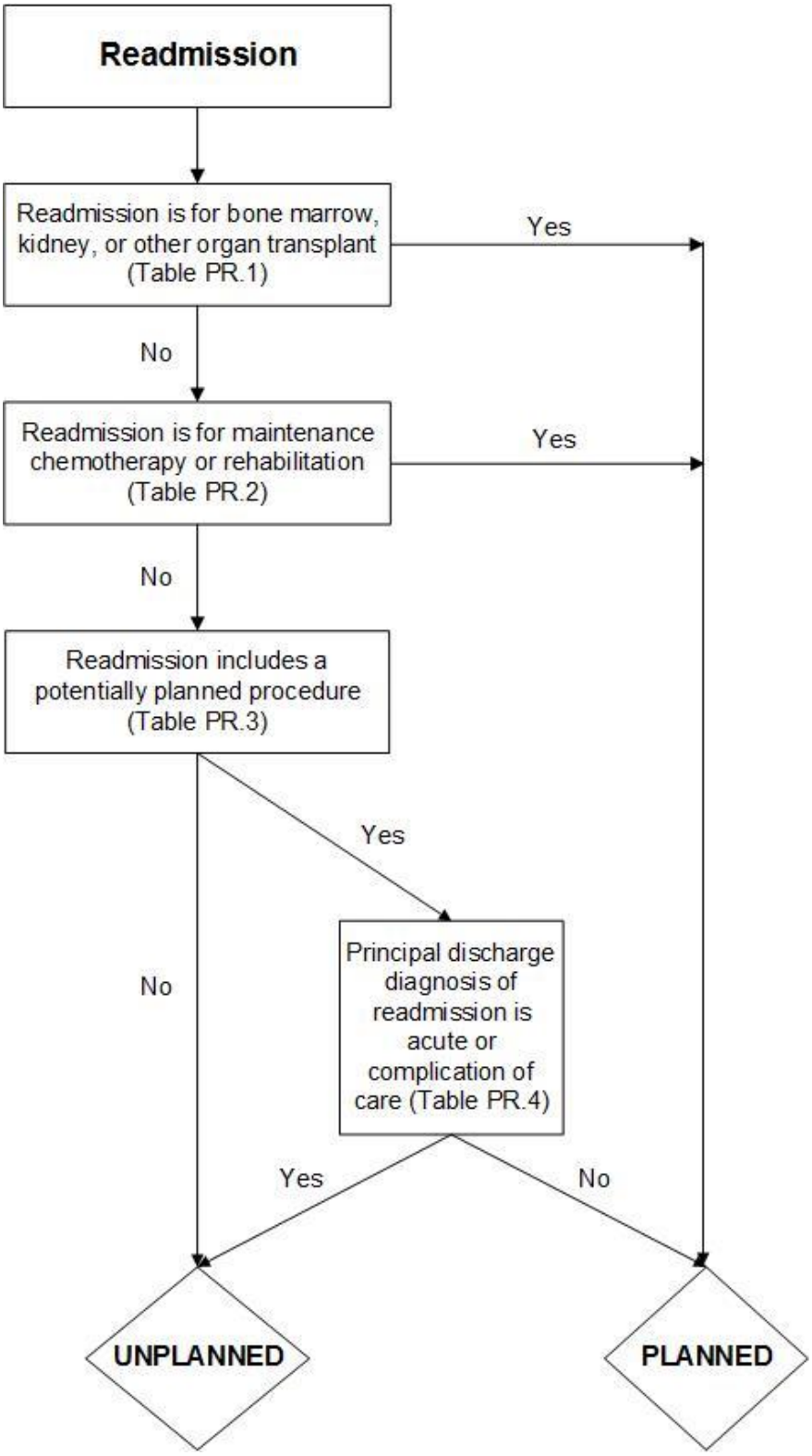
Unplanned readmission, from any cause, within 30 days from the date of discharge from an index admission.

Rationale: Planned readmissions are generally not a signal of quality of care. Including planned readmissions in a readmission measure could create a disincentive to provide appropriate care to patients who are scheduled for elective or necessary procedures within 30 days of discharge. From a patient perspective, an unplanned readmission from any cause is an adverse event. Outcomes occurring within 30 days of discharge can be influenced by hospital care and the early transition to

the non-acute care setting. The 30-day time frame is a clinically meaningful period for hospitals to collaborate with their communities to reduce readmissions.

Appendix E. Planned Readmission Algorithm

Figure PR.1 – Planned Readmission Algorithm Version 4.0 2018 (ICD-10) Flowchart



Planned Readmission Algorithm Version 4.0 2018 (ICD-10) Tables – AMI, COPD, HF, Pneumonia, and Stroke Measures

Note that the ICD-10-based AHRQ CCS categories listed in Tables PR.1 through PR.4 below and the singular ICD-10 codes described in Tables PR.3 and PR.4 (and listed in the supplemental Excel file on *QualityNet*) are used to identify planned readmissions in claims for discharges on or after October 1, 2015. The ICD-9-based AHRQ CCS categories and singular ICD-9 code lists for discharges prior to October 1, 2015 can be found in the 2016 condition-specific readmission measures updates and specifications report posted on *QualityNet.*

Table PR.1 – Procedure Categories That Are Always Planned (Version 4.0 2018 [ICD-10])

AHRQ CCS Procedure	Description
64	Bone marrow transplant
105	Kidney transplant
176	Other organ transplantation (other than bone marrow corneal or kidney)

Table PR.2 – Diagnosis Categories That Are Always Planned (Version 4.0 2018 [ICD-10])

AHRQ CCS Diagnosis	Description
45	Maintenance chemotherapy; radiotherapy
254	Rehabilitation care; fitting of prostheses; and adjustment of devices

Table PR.3 – Potentially Planned Procedures (Version 4.0 2018 [ICD-10])

Procedure Category/ICD-10-PCS Codes	Description
AHRQ CCS Procedure Categories	
1	Incision and excision of CNS
3	Excision destruction or resection of intervertebral disc
5	Insertion of catheter or spinal stimulator and injection into spinal canal
9	Other OR therapeutic nervous system procedures
10	Thyroidectomy; partial or complete
12	Therapeutic endocrine procedures
33	Other OR procedures on mouth and throat
36	Lobectomy or pneumonectomy
38	Other diagnostic procedures on lung and bronchus
40	Other diagnostic procedures on the respiratory system and mediastinum
43	Heart valve procedures
44	Coronary artery bypass graft (CABG)
45	Percutaneous transluminal coronary angioplasty (PTCA) with or without stent placement
49	Other OR heart procedures
51	Endarterectomy; vessel of head and neck
52	Aortic resection; replacement or anastomosis
53	Varicose vein stripping; lower limb
55	Peripheral vascular bypass
56	Other vascular bypass and shunt; not heart
59	Other OR procedures on vessels of head and neck
66	Procedures on spleen
67	Other procedures; hemic and lymphatic systems
74	Gastrectomy; partial and total
78	Colorectal resection
79	Excision (partial) of large intestine (not endoscopic)
84	Cholecystectomy and common duct exploration
85	Inguinal and femoral hernia repair
86	Other hernia repair
99	Other OR gastrointestinal therapeutic procedures
104	Nephrectomy; partial or complete
106	Genitourinary incontinence procedures
107	Extracorporeal lithotripsy; urinary
109	Procedures on the urethra
112	Other OR therapeutic procedures of urinary tract
113	Transurethral resection of prostate (TURP)
114	Open prostatectomy
119	Oophorectomy; unilateral and bilateral
120	Other operations on ovary
124	Hysterectomy; abdominal and vaginal
129	Repair of cystocele and rectocele; obliteration of vaginal vault
132	Other OR therapeutic procedures; female organs
142	Partial excision bone
152	Arthroplasty knee
153	Hip replacement; total and partial
154	Arthroplasty other than hip or knee

Procedure Category/ICD-10-PCS Codes	Description
158	Spinal fusion
159	Other diagnostic procedures on musculoskeletal system
166	Lumpectomy; quadrantectomy of breast
167	Mastectomy
172	Skin graft
175	Other OR therapeutic procedures on skin subcutaneous tissue fascia and breast
ICD-10-PCS Codes - ICD-10-PCS code list posted on *QualityNet*	

Table PR.4 – Acute Diagnoses (Version 4.0 2018 [ICD-10])

Diagnosis Category/ICD-10-CM Codes	Description
AHRQ CCS Diagnosis Categories	
1	Tuberculosis
2	Septicemia (except in labor)
3	Bacterial infection; unspecified site
4	Mycoses
5	HIV infection
7	Viral infection
8	Other infections; including parasitic
9	Sexually transmitted infections (not HIV or hepatitis)
54	Gout and other crystal arthropathies
55	Fluid and electrolyte disorders
60	Acute posthemorrhagic anemia
61	Sickle cell anemia
63	Diseases of white blood cells
76	Meningitis (except that caused by tuberculosis or sexually transmitted disease)
77	Encephalitis (except that caused by tuberculosis or sexually transmitted disease)
78	Other CNS infection and poliomyelitis
82	Paralysis
83	Epilepsy; convulsions
84	Headache; including migraine
85	Coma; stupor; and brain damage
87	Retinal detachments; defects; vascular occlusion; and retinopathy
89	Blindness and vision defects
90	Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease)
91	Other eye disorders
92	Otitis media and related conditions
93	Conditions associated with dizziness or vertigo
99	Hypertension with complications and secondary hypertension
102	Nonspecific chest pain
104	Other and ill-defined heart disease
107	Cardiac arrest and ventricular fibrillation
109	Acute cerebrovascular disease
112	Transient cerebral ischemia
116	Aortic and peripheral arterial embolism or thrombosis
118	Phlebitis; thrombophlebitis and thromboembolism
120	Hemorrhoids
122	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)
123	Influenza
124	Acute and chronic tonsillitis
125	Acute bronchitis
126	Other upper respiratory infections
127	Chronic obstructive pulmonary disease and bronchiectasis
128	Asthma
129	Aspiration pneumonitis; food/vomitus
130	Pleurisy; pneumothorax; pulmonary collapse

Diagnosis Category/ICD-10-CM Codes	Description
131	Respiratory failure; insufficiency; arrest (adult)
135	Intestinal infection
137	Diseases of mouth; excluding dental
139	Gastroduodenal ulcer (except hemorrhage)
140	Gastritis and duodenitis
142	Appendicitis and other appendiceal conditions
145	Intestinal obstruction without hernia
146	Diverticulosis and diverticulitis
148	Peritonitis and intestinal abscess
153	Gastrointestinal hemorrhage
154	Noninfectious gastroenteritis
157	Acute and unspecified renal failure
159	Urinary tract infections
165	Inflammatory conditions of male genital organs
168	Inflammatory diseases of female pelvic organs
172	Ovarian cyst
197	Skin and subcutaneous tissue infections
198	Other inflammatory condition of skin
226	Fracture of neck of femur (hip)
227	Spinal cord injury
229	Fracture of upper limb
233	Intracranial injury
234	Crushing injury or internal injury
235	Open wounds of head; neck; and trunk
238	Complications of surgical procedures or medical care
239	Superficial injury; contusion
240	Burns
241	Poisoning by psychotropic agents
242	Poisoning by other medications and drugs
243	Poisoning by nonmedicinal substances
244	Other injuries and conditions due to external causes
245	Syncope
246	Fever of unknown origin
247	Lymphadenitis
249	Shock
250	Nausea and vomiting
251	Abdominal pain
252	Malaise and fatigue
253	Allergic reactions
259	Residual codes; unclassified
650	Adjustment disorders
651	Anxiety disorders
652	Attention-deficit conduct and disruptive behavior disorders
653	Delirium dementia and amnestic and other cognitive disorders
656	Impulse control disorders NEC
658	Personality disorders
660	Alcohol-related disorders
661	Substance-related disorders

Diagnosis Category/ICD-10-CM Codes	Description
662	Suicide and intentional self-inflicted injury
663	Screening and history of mental health and substance abuse codes
670	Miscellaneous mental health disorders
ICD-10-CM Codes - ICD-10-CM code list posted on *QualityNet*	

Controlling High Blood Pressure (CBP)

SUMMARY OF CHANGES TO HEDIS 2020

- Modified value sets to make them compatible with digital measure formatting.
- Removed "with or without a telehealth modifier" language; refer to *General Guideline 43*.
- Added value sets to identify outpatient telehealth visits for the event/diagnosis.
- Updated value sets used to identify advanced illness.
- Updated the Hybrid specification to indicate that sample size reduction is allowed.
- Clarified optional exclusion criteria apply to both the Administrative and Hybrid data collection methods.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 18–85 years of age who had a diagnosis of hypertension (HTN) and whose BP was adequately controlled (<140/90 mm Hg) during the measurement year.

Definitions

Adequate control	Both a representative systolic BP <140 mm Hg and a representative diastolic BP of <90 mm Hg.
Representative BP	The most recent BP reading during the measurement year on or after the second diagnosis of hypertension. If multiple BP measurements occur on the same date, or are noted in the chart on the same date, use the lowest systolic and lowest diastolic BP reading. If no BP is recorded during the measurement year, assume that the member is "not controlled."

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicaid, Medicare (report each product line separately).
Ages	18–85 years as of December 31 of the measurement year.
Continuous enrollment	The measurement year.
Allowable gap	No more than one gap in continuous enrollment of up to 45 days during the measurement year. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
Anchor date	December 31 of the measurement year.

Benefit Medical.

Event/diagnosis Members who had at least two visits on different dates of service with a diagnosis of hypertension during the measurement year or the year prior to the measurement year (count services that occur over both years). Visit type need not be the same for the two visits. Any of the following code combinations meet criteria:

- Outpatient visit (Outpatient Without UBREV Value Set) with any diagnosis of hypertension (Essential Hypertension Value Set).
- A telephone visit (Telephone Visits Value Set) with any diagnosis of hypertension (Essential Hypertension Value Set).
- An online assessment (Online Assessments Value Set) with any diagnosis of hypertension (Essential Hypertension Value Set).

Only one of the two visits may be a telephone visit, an online assessment or an outpatient telehealth visit. Identify outpatient telehealth visits by the presence of a telehealth modifier (Telehealth Modifier Value Set) or the presence of a telehealth POS code (Telehealth POS Value Set) associated with the outpatient visit.

Exclusions Exclude members who meet any of the following criteria:

Note: *Supplemental and medical record data may not be used for these exclusions.*

- Medicare members 66 years of age and older as of December 31 of the measurement year who meet either of the following:
  - Enrolled in an Institutional SNP (I-SNP) any time during the measurement year.
  - Living long-term in an institution any time during the measurement year as identified by the LTI flag in the Monthly Membership Detail Data File. Use the run date of the file to determine if a member had an LTI flag during the measurement year.
- Members 66–80 years of age as of December 31 of the measurement year (all product lines) with frailty ***and*** advanced illness. Members must meet *both* of the following frailty and advanced illness criteria to be excluded:
  1. At least one claim/encounter for frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) during the measurement year.
  2. Any of the following during the measurement year or the year prior to the measurement year (count services that occur over both years):
     - At least two outpatient visits (Outpatient Value Set), observation visits (Observation Value Set), ED visits (ED Value Set), nonacute inpatient encounters (Nonacute Inpatient Value Set) or nonacute inpatient discharges (instructions below) on different dates of service, with an advanced illness diagnosis (Advanced Illness Value Set). Visit type need not be the same for the two visits. To identify a nonacute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).

2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim.
3. Identify the discharge date for the stay.

– At least one acute inpatient encounter (Acute Inpatient Value Set) with an advanced illness diagnosis (Advanced Illness Value Set).
– At least one acute inpatient discharge with an advanced illness diagnosis (Advanced Illness Value Set). To identify an acute inpatient discharge:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
  3. Identify the discharge date for the stay.
– A dispensed dementia medication (Dementia Medications List).

- Members 81 years of age and older as of December 31 of the measurement year (all product lines) with frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) during the measurement year.

Dementia Medications

Description	Prescription		
Cholinesterase inhibitors	• Donepezil	• Galantamine	• Rivastigmine
Miscellaneous central nervous system agents	• Memantine		

Administrative Specification

Denominator The eligible population.

Numerator Identify the most recent BP reading (Systolic Blood Pressure Value Set; Diastolic Blood Pressure Value Set) taken during an outpatient visit (Outpatient Without UBREV Value Set), a nonacute inpatient encounter (Nonacute Inpatient Value Set), or remote monitoring event (Remote Blood Pressure Monitoring Value Set) during the measurement year.

The BP reading must occur *on or after* the date of the second diagnosis of hypertension (identified using the event/diagnosis criteria).

The member is numerator compliant if the BP is <140/90 mm Hg. The member is not compliant if the BP is ≥140/90 mm Hg, if there is no BP reading during the measurement year or if the reading is incomplete (e.g., the systolic or diastolic level is missing). If there are multiple BPs on the same date of service, use the lowest systolic and lowest diastolic BP on that date as the representative BP.

Organizations that use CPT Category II codes to identify numerator compliance for this indicator must search for all codes in the following value sets and use the most recent codes during the measurement year to determine numerator compliance for both systolic and diastolic levels.

Value Set	Numerator Compliance
Systolic Less Than 140 Value Set	Systolic compliant
Systolic Greater Than or Equal To 140 Value Set	Systolic not compliant
Diastolic Less Than 80 Value Set	Diastolic compliant
Diastolic 80–89 Value Set	Diastolic compliant
Diastolic Greater Than or Equal To 90 Value Set	Diastolic not compliant

Exclusions *(optional)*

- Exclude from the eligible population all members with evidence of end-stage renal disease (ESRD) (ESRD Diagnosis Value Set), dialysis (Dialysis Procedure Value Set), nephrectomy (Nephrectomy Value Set) or kidney transplant (Kidney Transplant Value Set; History of Kidney Transplant Value Set) on or prior to December 31 of the measurement year.
- Exclude from the eligible population female members with a diagnosis of pregnancy (Pregnancy Value Set) during the measurement year.
- Exclude from the eligible population all members who had a nonacute inpatient admission during the measurement year. To identify nonacute inpatient admissions:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim.
  3. Identify the admission date for the stay.

Hybrid Specification

Denominator

A systematic sample drawn from the eligible population. The organization may reduce the sample size using the prior year's audited, product-line-specific rate. Refer to the to the *Guidelines for Calculations and Sampling* for information on reducing the sample size.

Identifying the medical record

All eligible BP measurements recorded in the record must be considered. If an organization cannot find the medical record, the member remains in the measure denominator and is considered noncompliant for the numerator.

Use the following guidance to find the appropriate medical record to review.

- Identify the member's PCP.
- If the member had more than one PCP for the time-period, identify the PCP who most recently provided care to the member.
- If the member did not visit a PCP for the time-period or does not have a PCP, identify the practitioner who most recently provided care to the member.
- If a practitioner other than the member's PCP manages the hypertension, the organization may use the medical record of that practitioner.

Numerator

The number of members in the denominator whose most recent BP (both systolic and diastolic) is adequately controlled during the measurement year. For a member's BP to be controlled the systolic and diastolic BP must be <140/90 mm Hg (adequate control). To determine if a member's BP is adequately controlled, the representative BP must be identified.

Administrative Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record Identify the most recent BP reading noted during the measurement year.

The BP reading must occur on or after the date when the second diagnosis of hypertension (identified using the event/diagnosis criteria) occurred.

Do not include BP readings:

- Taken during an acute inpatient stay or an ED visit.
- Taken on the same day as a diagnostic test or diagnostic or therapeutic procedure that requires a change in diet or change in medication on or one day before the day of the test or procedure, with the exception of fasting blood tests.
- Reported by or taken by the member.

BP readings from remote monitoring devices that are digitally stored and transmitted to the provider may be included. There must be documentation in the medical record that clearly states the reading was taken by an electronic device, and results were digitally stored and transmitted to the provider, and interpreted by the provider.

Note: *Member-reported results to the provider from a remote monitoring device are not acceptable.*

Identify the lowest systolic and lowest diastolic BP reading from the most recent BP notation in the medical record. If multiple readings were recorded for a single date, use the lowest systolic and lowest diastolic BP on that date as the representative BP. The systolic and diastolic results do not need to be from the same reading.

The member is not compliant if the BP reading is ≥140/90 mm Hg or is missing, or if there is no BP reading during the measurement year or if the reading is incomplete (e.g., the systolic or diastolic level is missing).

Exclusions *(optional)*

Refer to the *Administrative Specification* for exclusion criteria. Exclusionary evidence in the medical record must include a note indicating diagnosis of pregnancy or evidence of a nonacute inpatient admission during the measurement year, ***or*** evidence of ESRD, dialysis, nephrectomy or kidney transplant any time during the member's history through December 31 of the measurement year.

Note

- *When identifying the most recent BP reading, all eligible BP readings in the appropriate medical record should be considered, regardless of practitioner type and setting (excluding acute inpatient and ED visit settings).*
- *An EMR can be used to identify the most recent BP reading if it meets the criteria for appropriate medical record.*
- *When excluding BP readings from the numerator, the intent is to identify diagnostic or therapeutic procedures that require a medication regimen, a change in diet or a change in medication. For example (this list is just for reference, and is not exhaustive):*

  - *A colonoscopy requires a change in diet (NPO on the day of procedure) and a medication change (a medication is taken to prep the colon).*
  - *Dialysis, infusions and chemotherapy (including oral chemotherapy) are all therapeutic procedures that require a medication regimen.*
  - *A nebulizer treatment with albuterol is considered a therapeutic procedure that requires a medication regimen (the albuterol).*
  - *A patient forgetting to take regular medications on the day of the procedure is not considered a required change in medication, and therefore the BP reading is eligible.*
- *BP readings taken on the same day that the member receives a common low-intensity or preventive procedure are eligible for use. For example, the following procedures are considered common low-intensity or preventive (this list is just for reference, and is not exhaustive):*
  - *Vaccinations.*
  - *Injections (e.g., allergy, vitamin B-12, insulin, steroid, toradol, Depo-Provera, testosterone, lidocaine).*
  - *TB test.*
  - *IUD insertion.*
  - *Eye exam with dilating agents.*
  - *Wart or mole removal.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table CBP-1/2/3: Data Elements for Controlling High Blood Pressure

	Admin	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		✓
Current year's administrative rate (before exclusions)		✓
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		✓
Administrative rate on MRSS		✓
Number of medical records excluded because of valid data errors		✓
Number of administrative data records excluded		✓
Number of medical record data records excluded		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	✓	✓
Numerator events by medical records		✓
Numerator events by supplemental data	✓	✓
Reported rate	✓	✓

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Controlling High Blood Pressure

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Using product line criteria is not required. Including any product line, combining product lines, or not including product line criteria is allowed.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age as of June 30"). The denominator age may be changed if the range is within the specified age range (ages 18–85 years). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefit	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Only events that contain (or map to) codes in the value sets may be used to identify visits. Value sets and logic may not be changed.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Value sets may not be changed.
Exclusions: I-SNP, LTI, Frailty or Advanced Illness	Yes	These exclusions are not required. Refer to Exclusions in the Guidelines for the Rules for Allowable Adjustments.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Adequate control of blood pressure	No	Value sets and logic may not be changed.

*Depression Remission or Response for Adolescents and Adults (DRR)**

***Adapted with financial support from the Agency for Healthcare Research and Quality (AHRQ) and CMS under the CHIPRA Pediatric Quality Measures Program Centers of Excellence grant number U18HS025296, from depression measures developed by Minnesota Community Measurement.**

SUMMARY OF CHANGES TO HEDIS 2020

- Restructured the format of ECDS measures header layout (e.g., reformatted stratifications, added Participation Period to the *Definitions* section, removed underlining from value set names).
- Clarified that the age stratifications are reported as of the start of the Intake Period.
- Added Reporting to the *Guidance* section.
- Modified value sets to make them compatible with digital measure formatting.
- Added direct reference codes for Medicaid, Medicare, Private Health Insurance (Commercial) and Birth Date.
- Revised the former "Data Source" column to "Data Source Logic" in the Data Elements for Reporting tables.
- Removed the collection of the "Initial Population" and "Denominator" data elements by SSoR in the Data Elements for Reporting tables.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 12 years of age and older with a diagnosis of depression and an elevated PHQ-9 score, who had evidence of response or remission within 4–8 months of the elevated score.

- *Follow-Up PHQ-9*. The percentage of members who have a follow-up PHQ-9 score documented within 4–8 months after the initial elevated PHQ-9 score.
- *Depression Remission*. The percentage of members who achieved remission within 4–8 months after the initial elevated PHQ-9 score.
- *Depression Response*. The percentage of members who showed response within 4–8 months after the initial elevated PHQ-9 score.

Measurement Period

January 1–December 31.

Clinical Recommendation Statement

The Institute for Clinical Systems Improvement recommends that clinicians establish and maintain follow-up with adult patients who have depression. Appropriate, reliable follow-up is highly correlated with improved response and remission scores.

The American Academy of Pediatrics recommends that adolescents with depression should be assessed for treatment response and remission of symptoms using a depression assessment tool such as the PHQ-9 Modified for Teens.

References

Trangle, M., J. Gursky, R. Haight, J. Hardwig, T. Hinnenkamp, D. Kessler, N. Mack, M. Myszkowski. Institute for Clinical Systems Improvement. *Adult Depression in Primary Care.* Updated March 2016.

Cheung, A.H., R.A. Zuckerbrot, P.S. Jensen, D. Laraque, R.E.K. Stein, GLAD-PC STEERING GROUP. 2018. "Guidelines for Adolescent Depression in Primary Care (GLAD-PC): II. Treatment and Ongoing management." *Pediatrics* 141(3):e20174082.

Characteristics

Scoring Proportion.

Type Outcome.

Item count Person.

Stratification Report the following age stratifications as of the start of the Intake Period.

1. Commercial: 12–17*.
2. Commercial: 18–44*.
3. Commercial: 45–64*.
4. Commercial: 65+*.
5. Medicaid: 12–17.
6. Medicaid: 18–44.
7. Medicaid: 45–64.
8. Medicaid: 65+.
9. Medicare: 18–44.
10. Medicare: 45–64.
11. Medicare: 65+.

**Note that "Commercial" plans can be identified via the "Private Health Insurance" Direct Reference Code.*

Risk adjustment None.

Improvement notation A higher rate indicates better performance.

Guidance

Allocation:

The member was enrolled with a medical benefit throughout the Participation Period. A gap in enrollment is allowed only in the Measurement Period. No gaps in enrollment are allowed from April 1 of the year prior to the Measurement Period through December 31 of the year prior to the Measurement Period.

Requirements:

- The measure allows two PHQ-9 assessments. Selection of the appropriate assessment should be based on the member's age.
  - *PHQ-9:* 12 years of age and older.
  - *PHQ-9 Modified for Teens:* 12–17 years of age.
- The PHQ-9 assessment does not need to occur during a face-to-face encounter; it may be completed over the telephone or through a web-based portal.

Reporting:

The total for each product line is the sum of the age stratifications.

Definitions

Intake Period	April 1 of the year prior to the Measurement Period through March 31 of the Measurement Period.
Depression Follow-Up Period	The 120–240 day period after the IESD.
IESD	Index Episode Start Date. The earliest date during the intake period where a PHQ-9 total score >9 is documented.
Participation	The identifiers and descriptors for each organization's coverage used to define members' eligibility for measure reporting. Allocation for HEDIS reporting is based on eligibility during the Participation Period.
Participation Period	April 1 of the year prior to the Measurement Period through December 31 of the Measurement Period.

Initial Population

Members 12 years and older as of the start of the Intake Period who meet ***all*** the following criteria:

- A PHQ-9 total score >9 documented during the Intake Period.
- A diagnosis of major depression or dysthymia that starts before and overlaps or starts during the IESD.
- Participation.

Exclusions

Exclusions

Exclude members with any of the following at any time during the Intake Period or during the Measurement Period.

- Bipolar disorder.
- Personality disorder.
- Psychotic disorder.
- Pervasive developmental disorder.

or

- In hospice or using hospice services during the Measurement Period.

Depression Follow-Up (Population Criteria 1)

Denominator 1	The Initial Population, minus Exclusions.
Numerator 1	A PHQ-9 total score in the member's record during the Depression Follow-Up Period.

Depression Remission (Population Criteria 2)

Denominator 2 Same as Denominator 1.

Numerator 2 Members who achieve remission of depression symptoms, as demonstrated by the most recent PHQ-9 total score of <5 documented during the Depression Follow-Up Period.

Depression Response (Population Criteria 3)

Denominator 3 Same as Denominator 1.

Numerator 3 Members who indicate a response to treatment for depression, as demonstrated by the most recent PHQ-9 total score being at least 50 percent lower than the PHQ-9 score associated with the IESD, documented during the Depression Follow-Up Period.

Data Criteria (Element Level)

Value Sets:

- Diagnosis: Bipolar Disorder (2.16.840.1.113883.3.464.1004.1044)
- Diagnosis: Major Depression or Dysthymia (2.16.840.1.113883.3.464.1004.1351)
- Diagnosis: Other Bipolar Disorder (2.16.840.1.113883.3.464.1004.1399)
- Diagnosis: Personality Disorder (2.16.840.1.113883.3.464.1004.1355)
- Diagnosis: Pervasive Developmental Disorder (2.16.840.1.113883.3.464.1004.1356)
- Diagnosis: Psychotic Disorders (2.16.840.1.113883.3.464.1004.1352)
- Encounter, Performed: Hospice Encounter (2.16.840.1.113883.3.464.1004.1761)
- Intervention, Order: Hospice Intervention (2.16.840.1.113883.3.464.1004.1762)
- Intervention, Performed: Hospice Intervention (2.16.840.1.113883.3.464.1004.1762)

Direct Reference Codes:

- Assessment, Performed: Patient Health Questionnaire 9 item (PHQ-9) total score [Reported] (LOINC Code 44261-6)
- Assessment, Performed: Patient Health Questionnaire-9: Modified for Teens total score [Reported.PHQ.Teen] (LOINC Code 89204-2)
- Participation: MEDICAID (SOP Code 2)
- Participation: MEDICARE (SOP Code 1)
- Participation: PRIVATE HEALTH INSURANCE (SOP Code 5)
- Patient Characteristic Birthdate: Birth date (LOINC Code 21112-8)

Data Elements for Reporting

Organizations that submit data to NCQA must provide the following data elements in a specified file.

Table DRR-A-1/2/3: Metadata Elements for Depression Remission or Response for Adolescents and Adults

Metadata ID	Metadata Specification
MeasurementYear	Measurement year
CollectionMethod	Data collection methodology (electronic clinical data)

Table DRR-B-1/2: Data Elements for Depression Remission or Response for Adolescents and Adults (Medicaid and Commercial)

Indicator	Age	Data Element	Data Source Logic
Depression Follow-Up	12-17	Initial population	Report by data source
Depression Remission	18-44	Exclusions	Report by data source
Depression Response	45-64	Denominator	Summed over data sources
	65+	Numerator	Report by data source

Table DRR-B-3: Data Elements for Depression Remission or Response for Adolescents and Adults (Medicare)

Indicator	Age	Data Element	Data Source Logic
Depression Follow-Up	18-44	Initial population	Report by data source
Depression Remission	45-64	Exclusions	Report by data source
Depression Response	65+	Denominator	Summed over data sources
		Numerator	Report by data source

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Depression Remission or Response for Adolescents and Adults

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	The age determination dates may be changed (e.g., select, "age as of June 30"). Changing the denominator age range is allowed if the limits are within the specified age range (12 and older). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Using a benefit is not required; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Only events or diagnoses that contain (or map to) codes in the value sets may be used to identify visits with a diagnosis. The value sets and logic may not be changed.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Exclusions	No	Apply exclusions according to specified value sets.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• PHQ-9 Score • Depression Remission • Depression Response	No	Value sets, Direct Reference Codes and logic may not be changed.

*Depression Screening and Follow-Up for Adolescents and Adults (DSF)**

***Adapted with financial support from CMS from a provider-level measure developed by Quality Insights of Pennsylvania (QIP) (NQF #0418, CMS2).**

SUMMARY OF CHANGES TO HEDIS 2020

- Restructured the format of ECDS measures header layout (e.g., reformatted stratifications, added Participation Period to the *Definitions* section, removed underlining from value set names).
- Added Reporting to the *Guidance* section.
- Updated the positive finding score for the Center for Epidemiologic Studies Depression Scale-Revised (CESD-R) depression screening instrument from ≥10 to ≥17.
- Added Edinburgh Postnatal Depression Scale (EPDS) to list of depression screening instruments for adolescents.
- Added Duke Anxiety Depression Scale (DADS) to list of depression screening instruments for adults and added an associated direct reference code.
- Modified value sets to make them compatible with digital measure formatting.
- Revised the timing for the exclusion for bipolar disorder from "during the Measurement Period or the year prior to the Measurement Period" to "during the year prior to the Measurement Period."
- Added direct reference codes for Medicaid, Medicare, Private Health Insurance (Commercial) and Birth Date.
- Added Attributes to the *Data Criteria (element level)* section.
- Revised the former "Data Source" column to "Data Source Logic" in the Data Elements for Reporting tables.
- Removed the collection of the "Initial Population" and "Denominator" data elements by SSoR in the Data Elements for Reporting tables.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 12 years of age and older who were screened for clinical depression using a standardized instrument and, if screened positive, received follow-up care.

- *Depression Screening.* The percentage of members who were screened for clinical depression using a standardized instrument.
- *Follow-Up on Positive Screen*. The percentage of members who received follow-up care within 30 days of a positive depression screen finding.

Measurement Period

January 1–December 31.

Clinical Recommendation Statement

The U.S. Preventive Services Task Force (USPSTF) recommends screening for depression among adolescents 12–18 years and the general adult population, including pregnant and postpartum women. The USPSTF also recommends that screening be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment and appropriate follow-up.

References

U.S. Preventive Services Task Force. 2016. "Screening for Depression in Children and Adolescents: U.S. Preventive Services Task Force Recommendation Statement." *Annals of Internal Medicine* 164:360–6.

U.S. Preventive Services Task Force. 2016. "Screening for Major Depressive Disorder in Adults: US Preventive Services Task Force Recommendation Statement." *Journal of the American Medical Association* 315(4):380–7.

Characteristics

Scoring Proportion.

Type Process.

Item count Person.

Stratification

1. Commercial: 12–17.*
2. Commercial: 18–44.*
3. Commercial: 45–64.*
4. Commercial: 65+*.
5. Medicaid: 12–17.
6. Medicaid: 18–44.
7. Medicaid: 45–64.
8. Medicaid: 65+.
9. Medicare: 18–44.
10. Medicare: 45–64.
11. Medicare: 65+.

**Note that "Commercial" plans can be identified via the "Private Health Insurance" Direct Reference Code.*

Risk adjustment None.

Improvement notation A higher rate indicates better performance.

Guidance

Allocation:

The member was enrolled with a medical benefit throughout the Participation Period.

Requirements:

- This measure requires the use of an age-appropriate screening instrument. The member's age is used to select the appropriate depression screening instrument.
- Depression screening captured in health risk assessments or other types of health assessments are allowed if the questions align with a specific instrument that is validated for depression screening. For example, if a health risk assessment includes questions from the PHQ-2, it counts as screening if the member answered the questions and a total score is calculated.

Reporting:

The total for each product line is the sum of the age stratifications.

Definitions

Depression screening instruments

A standard assessment instrument that has been normalized and validated for the appropriate patient population. Eligible screening instruments with thresholds for positive findings include:

Instruments for Adolescents (12–17 years)	Positive Finding
Patient Health Questionnaire (PHQ-9)®	Total Score ≥5
Patient Health Questionnaire Modified for Teens (PHQ-9M)®	Total Score ≥5
PRIME MD-PHQ2®	Total Score ≥3
Beck Depression Inventory-Fast Screen (BDI-FS)®*	Total Score ≥4
Center for Epidemiologic Studies Depression Scale-Revised (CESD-R)	Total Score ≥17
Edinburgh Postnatal Depression Scale (EPDS)	Total Score ≥9
PROMIS Depression	Total Score (T Score) ≥52.5
Instruments for Adults (18+ years)	**Positive Finding**
Patient Health Questionnaire (PHQ-9)®	Total Score ≥5
PRIME MD-PHQ2®	Total Score ≥3
Beck Depression Inventory-Fast Screen (BDI-FS)®*	Total Score ≥4
Beck Depression Inventory (BDI-II)	Total Score ≥14
Center for Epidemiologic Studies Depression Scale-Revised (CESD-R)	Total Score ≥17
Duke Anxiety-Depression Scale (DADS)®*	Total Score ≥30
Geriatric Depression Scale Short Form (GDS)	Total Score ≥5
Geriatric Depression Scale Long Form (GDS)	Total Score ≥10
Edinburgh Postnatal Depression Scale (EPDS)	Total Score ≥9
My Mood Monitor (M-3)®	Total Score ≥5
PROMIS Depression	Total Score (T Score) ≥52.5
Clinically Useful Depression Outcome Scale (CUDOS)	Total Score ≥11

*Proprietary; may be cost or licensing requirement associated with use.

Participation

The identifiers and descriptors for each organization's coverage used to define members' eligibility for measure reporting. Allocation for HEDIS reporting is based on eligibility during the Participation Period.

Participation Period

The Measurement Period.

Initial Population

Members 12 years of age and older at the start of the Measurement Period who also meet criteria for Participation.

Exclusions

Exclusions

Exclude members with any of the following:

- Bipolar disorder during the year prior to the Measurement Period.
- Depression during the year prior to the Measurement Period.
- In hospice or using hospice services during the Measurement Period.

Depression Screening (Population Criteria 1)

Denominator 1

The Initial Population, minus Exclusions.

Numerator 1

Members with documentation of depression screening performed using an age-appropriate standardized instrument between January 1 and December 1 of the Measurement Period.

Follow-Up on Positive Screen (Population Criteria 2)

Denominator 2

All members from Numerator 1 with a positive depression screen finding between January 1 and December 1 of the Measurement Period.

Numerator 2

Members who received follow-up care on or up to 30 days after the date of the first positive screen.

Any of the following on or 30 days after the first positive screen:

- An outpatient or telephone follow-up visit with a diagnosis of depression or other behavioral health condition.
- A depression case management encounter that documents assessment for symptoms of depression or a diagnosis of depression or other behavioral health condition.
- A behavioral health encounter, including assessment, therapy, collaborative care or medication management.
- A dispensed antidepressant medication.

or

- Receipt of an assessment on the same day and subsequent to the positive screen.
  - Documentation of additional depression screening indicating either no depression or no symptoms that require follow-up. For example, if the initial positive screen resulted from a PHQ-2 score, documentation of a negative finding from a subsequent PHQ-9 qualifies as evidence of follow-up.

Data Criteria (Element Level)

Value Sets:

- Diagnosis: Bipolar Disorder (2.16.840.1.113883.3.464.1004.1044)
- Diagnosis: Depression (2.16.840.1.113883.3.464.1004.1390)
- Diagnosis: Other Bipolar Disorder (2.16.840.1.113883.3.464.1004.1399)
- Encounter, Performed: Behavioral Health Encounter (2.16.840.1.113883.3.464.1004.1383)
- Encounter, Performed: Depression Case Management Encounter (2.16.840.1.113883.3.464.1004.1389)
- Encounter, Performed: Follow Up Visit (2.16.840.1.113883.3.464.1004.1385)
- Encounter, Performed: Hospice Encounter (2.16.840.1.113883.3.464.1004.1761)
- Intervention, Order: Hospice Intervention (2.16.840.1.113883.3.464.1004.1762)
- Intervention, Performed: Hospice Intervention (2.16.840.1.113883.3.464.1004.1762)
- Medication, Dispensed: Antidepressant Medication (2.16.840.1.113883.3.464.1004.1503)

Direct Reference Codes:

- Assessment, Performed: Beck Depression Inventory Fast Screen total score [BDI] (LOINC Code 89208-3)
- Assessment, Performed: Beck Depression Inventory II total score [BDI] (LOINC Code 89209-1)
- Assessment, Performed: Center for Epidemiologic Studies Depression Scale-Revised total score [CESD-R] (LOINC Code 89205-9)
- Assessment, Performed: Clinically Useful Depression Outcome Scale [CUDOS] (LOINC Code 90221-3)
- Assessment, Performed: Final score [DADS] (LOINC Code 90853-3)
- Assessment, Performed: Edinburgh Postnatal Depression Scale [EPDS] (LOINC Code 71354-5)
- Assessment, Performed: Geriatric depression scale (GDS) short version total (LOINC Code 48545-8)
- Assessment, Performed: Geriatric depression scale (GDS) total (LOINC Code 48544-1)
- Assessment, Performed: Patient Health Questionnaire 2 item (PHQ-2) total score [Reported] (LOINC Code 55758-7)
- Assessment, Performed: Patient Health Questionnaire 9 item (PHQ-9) total score [Reported] (LOINC Code 44261-6)
- Assessment, Performed: Patient Health Questionnaire 9: Modified for Teens total score [Reported.PHQ.Teen] (LOINC Code 89204-2)
- Assessment, Performed: PROMIS 29 Depression score T score (LOINC Code 71965-8)
- Assessment, Performed: Total score [M3] (LOINC Code 71777-7)
- Participation: MEDICAID (SOP Code 2)
- Participation: MEDICARE (SOP Code 1)
- Participation: PRIVATE HEALTH INSURANCE (SOP Code 5)
- Patient Characteristic Birthdate: Birth date (LOINC Code 21112-8)
- Symptom: Symptoms of depression (finding) (SNOMEDCT Code 394924000)

Attributes:

- Depression or Other Behavioral Health Condition (2.16.840.1.113883.3.464.1004.1501)

Data Elements for IDSS Reporting

Organizations that submit data to NCQA must provide the following data elements in a specified file.

Table DSF-A-1/2/3: Metadata Elements for Depression Screening and Follow-Up for Adolescents and Adults

Metadata ID	Metadata Specification
MeasurementYear	Measurement year
CollectionMethod	Data collection methodology (electronic clinical data)

Table DSF-B-1/2: Data Elements for Depression Screening and Follow-Up for Adolescents and Adults (Medicaid and Commercial)

Indicator	Age	Data Element	Data Source Logic
Depression Screening	12-17	Initial population	Summed over data sources
Follow-Up on Positive Screen	18-44	Exclusions	Report by data source
	45-64	Denominator	Summed over data sources
	65+	Numerator	Report by data source

Table DSF-B-3: Data Elements for Depression Screening and Follow-Up for Adolescents and Adults (Medicare)

Indicator	Age	Data Element	Data Source Logic
Depression Screening	18-44	Initial population	Summed over data sources
Follow-Up on Positive Screen	45-64	Exclusions	Report by data source
	65+	Denominator	Summed over data sources
		Numerator	Report by data source

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Depression Screening and Follow-Up for Adolescents and Adults

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	The age determination dates may be changed (e.g., select, "age 12 during the measurement year). The denominator age may be changed if the range is within the specified age range (12 years and older). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Value sets and logic may not be changed for Denominator 2.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Exclusions	No	Apply exclusions according to specified value sets.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• Depression Screening • Follow-Up on Positive Screen	No	Value sets, Direct Reference Codes and logic may not be changed.

Measure:	Developmental Screening in the First Three Years of Life
Description:	The percentage of active patients screened for risk of developmental, behavioral and social delays using a standardized screening tool in the first three years of life. This is a measure of screening in the first three years of life that includes three, age-specific indicators assessing whether children are screened by 12 months of age, by 24 months of age and by 36 months of age.
Age criteria:	Children who turn 1, 2, or 3 years of age during the measurement year.
Numerator Statement:	The numerator identifies children who were screened for risk of developmental, behavioral and social delays using a standardized tool. National recommendations call for children to be screened at the 9, 18, and 24- OR 30-month well visits to ensure periodic screening in the first, second, and third years of life. The measure is based on three, age-specific indicators. Numerators 1-3 are for your understanding of the measures. Only Numerator 4 is required to report to PCMH-Kids. • **Numerator 1**: Children in Denominator 1 who had screening for risk of developmental, behavioral and social delays using a standardized screening tool that was documented by their first birthday • **Numerator 2**: Children in Denominator 2 who had screening for risk of developmental, behavioral and social delays using a standardized screening tool that was documented after their first and before or on their second birthday • **Numerator 3**: Children in Denominator 3 who had screening for risk of developmental, behavioral and social delays using a standardized screening tool that was documented after their second and before or on their third birthday • **Numerator 4**: Children in Denominator 4 who had screening for risk of developmental, behavioral and social delays using a standardized screening tool that was documented by their first, second or third birthday, i.e., the sum of numerators 1, 2, and 3. Documentation in the medical record must include all of the following: • A note indicating the date on which the test was performed, and • The standardized tool used (see below), and • Evidence of a screening result or screening score Tools must meet the following criteria: 1. Developmental domains: The following domains must be included in the standardized developmental screening tool: motor, language, cognitive, and social-emotional. 2. Established Reliability: Reliability scores of approximately 0.70 or above 3. Established Findings Regarding the Validity: Validity scores for the tool must be approximately 0.70 or above. Measures of validity must be conducted on a significant number of children and using an appropriate standardized developmental or social-emotional assessment instrument(s).

	4. Established Sensitivity/Specificity: Sensitivity and specificity scores of approximately 0.70 or above Current recommended tools that meet these criteria: 1. Ages and Stages Questionnaire (ASQ) - 2 months – 5 years 2. Ages and Stages Questionnaire - 3rd Edition (ASQ-3) 3. Battelle Developmental Inventory Screening Tool (BDI-ST) – Birth – 95 months 4. Bayley Infant Neuro-developmental Screen (BINS) - 3 months – 2 years 5. Brigance Screens-II – Birth – 90 months 6. Child Development Inventory (CDI) - 18 months–6 years 7. Infant Development Inventory – Birth – 18 months 8. Parents' Evaluation of Developmental Status (PEDS) – Birth – 8 years 9. Parent's Evaluation of Developmental Status - Developmental Milestones (PEDS-DM) 10. Survey of Wellbeing of Young Children (SWYC) Tools NOT included in this measure: It is important to note that standardized tools specifically focused on one domain of development [e.g. child's socio-emotional development (ASQ-SE) or autism (M-CHAT)] are not included in the list above as this measure is anchored to recommendations focused on global developmental screening using tools that focus on identifying risk for developmental, behavioral and social delays.
Denominator Statement:	Active patients who have been seen by the primary care clinician at the PCMH in the previous 12 months who meet the following eligibility requirement based on child's age at end of measurement year • **Denominator 1**: Active Patients who turn 1 during measurement year • **Denominator 2**: Active Patients who turn 2 during measurement year • **Denominator 3**: Active Patients who turn 3 during measurement year • **Denominator 4**: All Active Patients who turn 1, 2, or 3 the measurement year, i.e., the sum of denominators 1, 2, and 3
Acceptable Exclusions:	None
Look back Period:	Screenings must be completed prior to the patient's birthdate. In order to account for patients with birthdates at the beginning of the measurement year, reports should account for these encounters accordingly and place a lookback period on the patient's DOB rather than the measurement period. In order to account for age appropriate screenings, this look back should not exceed a 6 month lookback from the DOB in order to avoid erroneously counting developmental screenings used for prior years of age. Example: Patient 1 DOB: 1/15/2018 Patient 2 DOB: 5/31/2018

	Measurement period for both Patient 1 and 2: 1/1/2018 – 12/31/2018 Lookback period for Patient 1: 7/15/2017 -1/14/2018 Lookback period for Patient 2: 11/15/2017 – 5/30/2018
Source:	Oregon Pediatric Improvement Partnership at Oregon Health and Science University (OHSU)

Print this page

Release Notes:
Measure Information Form
Version 2019A

****NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE****

Measure Information Form

Measure Set: Perinatal Care (PC)

Set Measure ID: PC-01

Performance Measure Name: Elective Delivery

Description: Patients with elective vaginal deliveries or elective cesarean births at >= 37 and < 39 weeks of gestation completed

Rationale: For almost 3 decades, the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP) have had in place a standard requiring 39 completed weeks gestation prior to ELECTIVE delivery, either vaginal or operative (ACOG, 1996). A survey conducted in 2007 of almost 20,000 births in HCA hospitals throughout the U.S. carried out in conjunction with the March of Dimes at the request of ACOG revealed that almost 1/3 of all babies delivered in the United States are electively delivered with 5% of all deliveries in the U.S. delivered in a manner violating ACOG/AAP guidelines. Most of these are for convenience, and result in significant short term neonatal morbidity (neonatal intensive care unit admission rates of 13- 21%) (Clark et al., 2009).

According to Glantz (2005), compared to spontaneous labor, elective inductions result in more cesarean births and longer maternal length of stay. The American Academy of Family Physicians (2000) also notes that elective induction doubles the cesarean delivery rate. Repeat elective cesarean births before 39 weeks gestation also result in higher rates of adverse respiratory outcomes, mechanical ventilation, sepsis and hypoglycemia for the newborns (Tita et al., 2009).

Type Of Measure: Process

Improvement Noted As: Decrease in the rate

Numerator Statement: Patients with elective deliveries

> **Included Populations:** *ICD-10-PCS Principal Procedure Code or ICD-10-PCS Other Procedure Codes* for one or more of the following:
>
> - Medical induction of labor as defined in Appendix A, Table 11.05 while not in *Labor* prior to the procedure
> - Cesarean birth as defined in Appendix A, Table 11.06 and all of the following:
>   - not in *Labor*
>   - no history of a *Prior Uterine Surgery*
>
> **Excluded Populations:** None
>
> **Data Elements:**
>
> - *ICD-10-PCS Other Procedure Codes*
> - *ICD-10-PCS Principal Procedure Code*
> - *Labor*
> - *Prior Uterine Surgery*

Denominator Statement: Patients delivering newborns with >= 37 and < 39 weeks of gestation completed

> **Included Populations:**

- *ICD-10-PCS Principal Procedure Code or ICD-10-PCS Other Procedure Codes* for delivery as defined in Appendix A, Table 11.01.1

- *ICD-10-CM Principal Diagnosis Code or ICD-10-CM Other Diagnosis Codes* for planned cesarean birth in labor as defined in Appendix A, Table 11.06.1

Excluded Populations:

- *ICD-10-CM Principal Diagnosis Code or ICD-10-CM Other Diagnosis Codes* for conditions possibly justifying elective delivery prior to 39 weeks gestation as defined in Appendix A, Table 11.07
- History of prior stillbirth
- Less than 8 years of age
- Greater than or equal to 65 years of age
- Length of stay > 120 days
- *Gestational Age* < 37 or >= 39 weeks or UTD

Data Elements:

- *Admission Date*
- *Birthdate*
- *Discharge Date*
- *Gestational Age*
- *History of Stillbirth*
- *ICD-10-CM Other Diagnosis Codes*
- *ICD-10-CM Principal Diagnosis Code*

Risk Adjustment: No.

Data Collection Approach: Retrospective data sources for required data elements include administrative data and medical records.

Data Accuracy: Variation may exist in the assignment of ICD-10 codes; therefore, coding practices may require evaluation to ensure consistency.

Measure Analysis Suggestions: In order to identify areas for improvement, hospitals may want to review results based on specific ICD-10 codes or patient populations. Data could be analyzed further to determine specific patterns or trends to help reduce elective deliveries.

Sampling: Yes. For additional information see the Sampling Section.

Data Reported As: Aggregate rate generated from count data reported as a proportion.

Selected References:

- American Academy of Family Physicians. (2000). Tips from Other Journals: Elective induction doubles cesarean delivery rate, 61, 4.Retrieved December 29, 2008 at: http://www.aafp.org/afp/20000215/tips/39.html .
- American College of Obstetricians and Gynecologists. (November 1996). ACOG Educational Bulletin.
- Clark, S., Miller, D., Belfort, M., Dildy, G., Frye, D., & Meyers, J. (2009). Neonatal and maternal outcomes associated with elective delivery. [Electronic Version]. *Am J Obstet Gynecol*. 200:156.e1-156.e4.
- Glantz, J. (Apr.2005). Elective induction vs. spontaneous labor associations and outcomes. [Electronic Version]. *J Reprod Med*. 50(4):235-40.
- Tita, A., Landon, M., Spong, C., Lai, Y., Leveno, K., Varner, M, et al. (2009). Timing of elective repeat cesarean delivery at term and neonatal outcomes. [Electronic Version]. *NEJM*. 360:2, 111-120.

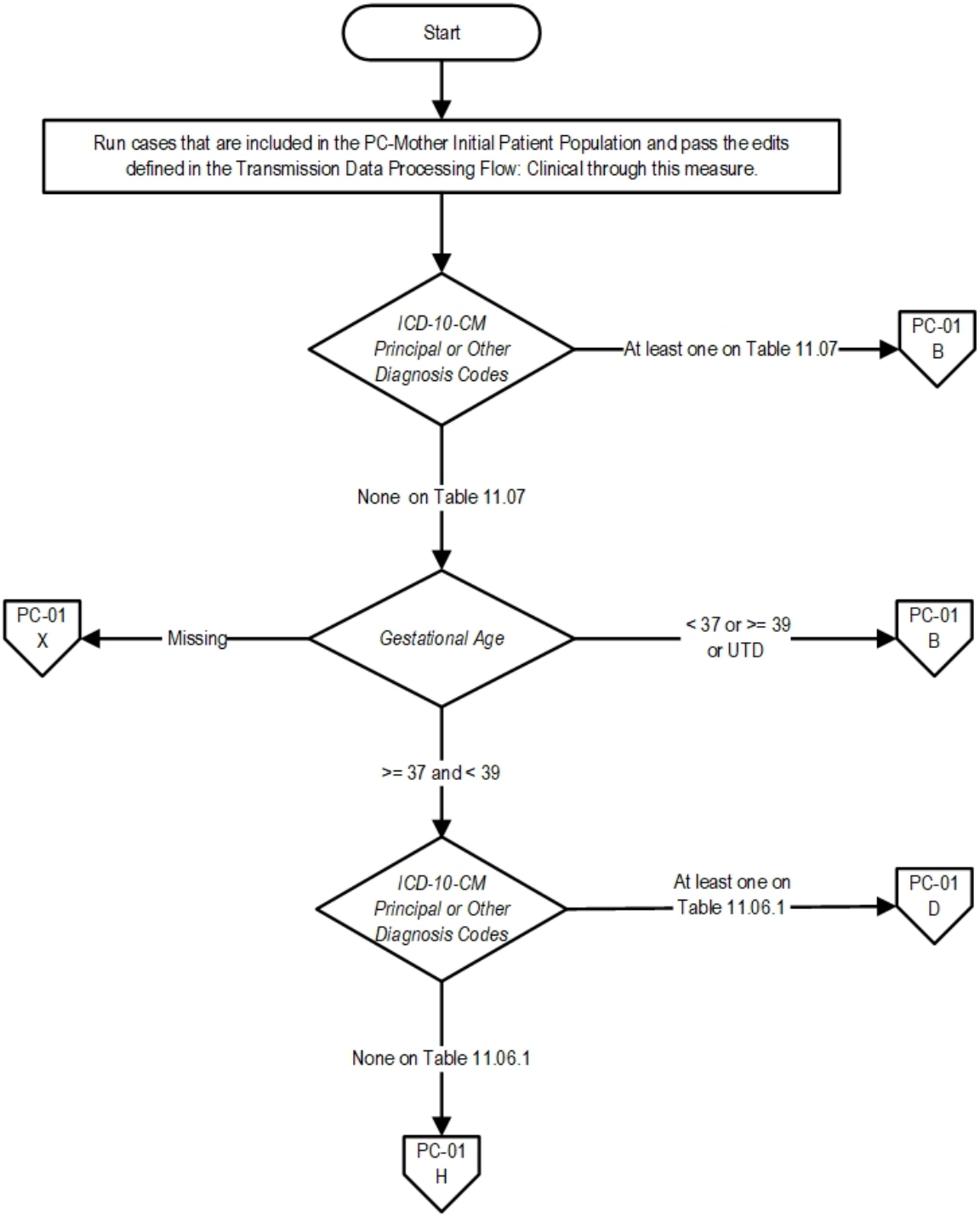
Original Performance Measure Source / Developer:
Hospital Corporation of America-Women's and Children's Clinical Services

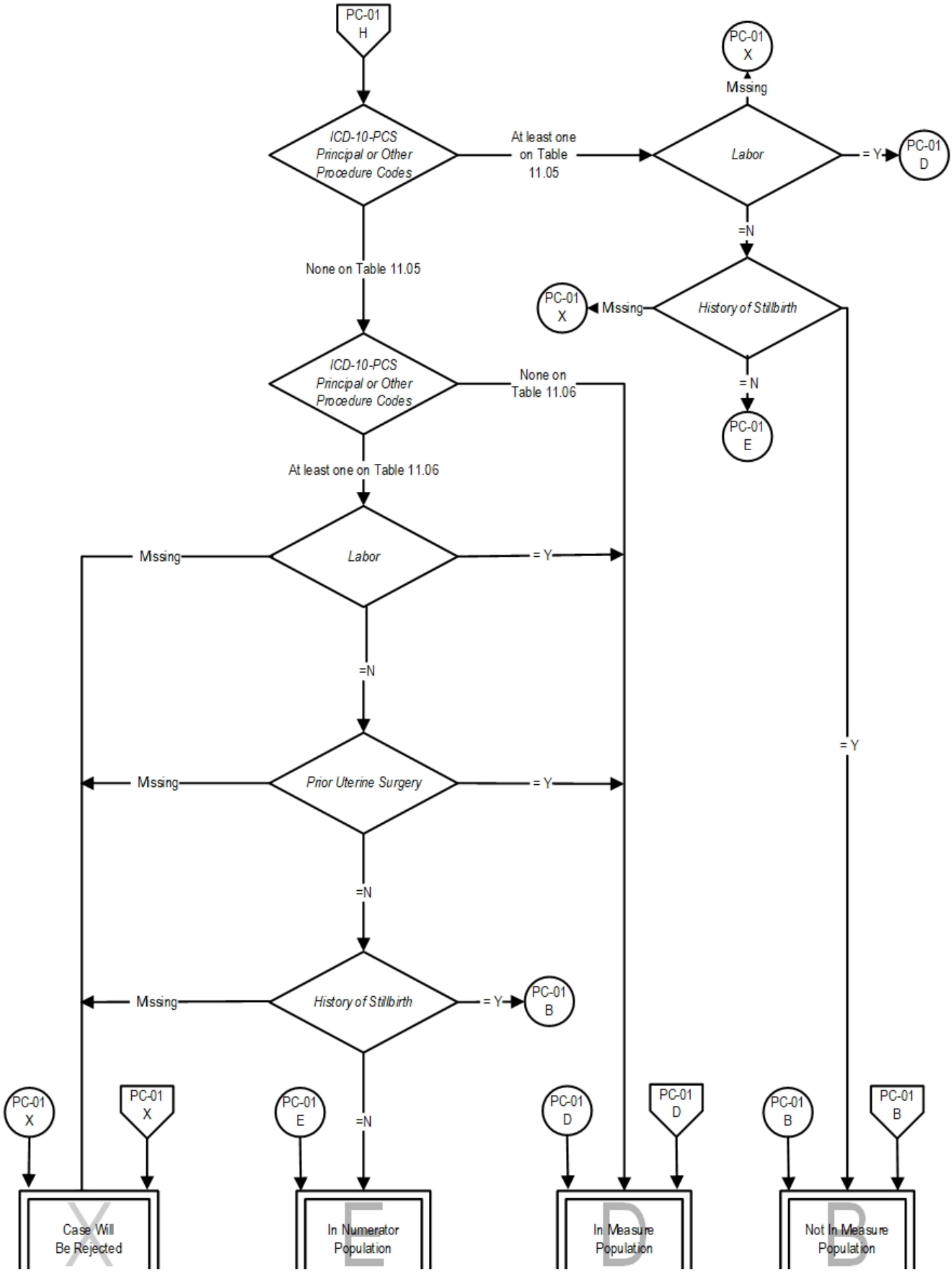
Measure Algorithm:

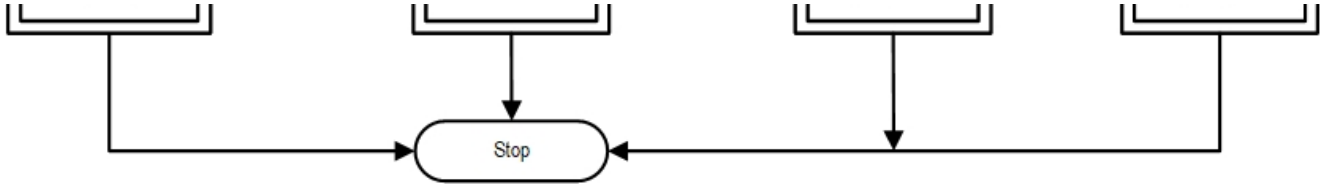
PC-01: Elective Delivery

Numerator: Patients with elective deliveries

Denominator: Patients delivering newborns with >= 37 and < 39 weeks of gestation completed




PC-01 H
ICD-10-PCS Principal or Other Procedure Codes
At least one on Table 11.05
PC-01 X
Mssing
Labor
= Y
PC-01 D
=N
None on Table 11.05
PC-01 X
Mssing
History of Stillbirth
= N
PC-01 E
ICD-10-PCS Principal or Other Procedure Codes
None on Table 11.06
At least one on Table 11.06
Mssing
Labor
= Y
=N
Mssing
Prior Uterine Surgery
= Y
=N
Mssing
History of Stillbirth
= Y
PC-01 B
= Y
PC-01 X
PC-01 X
PC-01 E
=N
PC-01 D
PC-01 D
PC-01 B
PC-01 B
X
Case Will Be Rejected
E
In Numerator Population
D
In Measure Population
B
Not In Measure Population



Specifications Manual for Joint Commission National Quality Measures (v2019A)

Print this page

Release Notes:
Measure Information Form
Version 2019A

****NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE****

Measure Information Form

Measure Set: Perinatal Care (PC)

Set Measure ID: PC-05

Performance Measure Name: Exclusive Breast Milk Feeding

Description: Exclusive breast milk feeding during the newborn's entire hospitalization

The measure is reported as an overall rate which includes all newborns that were exclusively fed breast milk during the entire hospitalization.

Rationale: Exclusive breast milk feeding for the first 6 months of neonatal life has long been the expressed goal of World Health Organization (WHO), Department of Health and Human Services (DHHS), American Academy of Pediatrics (AAP) and American College of Obstetricians and Gynecologists (ACOG). ACOG has recently reiterated its position (ACOG, 2007). A recent Cochrane review substantiates the benefits (Kramer et al., 2002). Much evidence has now focused on the prenatal and intrapartum period as critical for the success of exclusive (or any) BF (Centers for Disease Control and Prevention [CDC], 2007; Petrova et al., 2007; Shealy et al., 2005; Taveras et al., 2004). Exclusive breast milk feeding rate during birth hospital stay has been calculated by the California Department of Public Health for the last several years using newborn genetic disease testing data. Healthy People 2010 and the CDC have also been active in promoting this goal.

Type Of Measure: Process

Improvement Noted As: Increase in the rate

Numerator Statement: Newborns that were fed breast milk only since birth

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- *Exclusive Breast Milk Feeding*

Denominator Statement: Single term newborns discharged alive from the hospital

Included Populations: Liveborn newborns with *ICD-10-CM Principal Diagnosis Code* for single liveborn newborn as defined in Appendix A, Table 11.20.1

Excluded Populations:

- Admitted to the Neonatal Intensive Care Unit (NICU) at this hospital during the hospitalization
- *ICD-10-CM Other Diagnosis Codes* for galactosemia as defined in Appendix A, Table 11.21
- *ICD-10-PCS Principal Procedure Code or ICD-10-PCS Other Procedure Codes* for parenteral nutrition as defined in Appendix A, Table 11.22
- Experienced death
- Length of Stay >120 days
- Patients transferred to another hospital
- Patients who are not term or with < 37 weeks gestation completed

Data Elements:

- *Admission Date*
- *Admission to NICU*
- *Birthdate*
- *Discharge Date*
- *Discharge Disposition*
- *ICD-10-CM Other Diagnosis Codes*
- *ICD-10-CM Principal Diagnosis Code*
- *ICD-10-PCS Other Procedure Codes*
- *ICD-10-PCS Principal Procedure Code*
- *Term Newborn*

Risk Adjustment: No.

Data Collection Approach: Retrospective data sources for required data elements include administrative data and medical records.

Data Accuracy: Variation may exist in the assignment of ICD-10 codes; therefore, coding practices may require evaluation to ensure consistency.

Measure Analysis Suggestions: In order to identify areas for improvement in breast milk feeding rates, hospitals may wish to review documentation for reasons. Education efforts can be targeted based on the specific reasons identified.

Sampling: Yes. For additional information see the Sampling Section.

Data Reported As: Aggregate rate generated from count data reported as a proportion.

Selected References:

- American Academy of Pediatrics. (2005). Section on Breastfeeding. Policy Statement: Breastfeeding and the Use of Human Milk. *Pediatrics*.115:496— 506.
- American College of Obstetricians and Gynecologists. (Feb. 2007). Committee on Obstetric Practice and Committee on Health Care for Underserved Women.Breastfeeding: Maternal and Infant Aspects. ACOG Committee Opinion 361.
- California Department of Public Health. (2017). Division of Maternal, Child and Adolescent Health, Breastfeeding Initiative, In-Hospital Breastfeeding Initiation Data, Hospital of Occurrence: Available at: https://www.cdph.ca.gov/Programs/CFH/DMCAH/Breastfeeding/Pages/In-Hospital-Breastfeeding-Initiation-Data.aspx
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- Centers for Disease Control and Prevention. (2017). Division of Nutrition, Physical Activity and Obesity. Breastfeeding Report Card. Available at: https://www.cdc.gov/breastfeeding/data/reportcard.htm
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- Kramer, M.S. & Kakuma, R. (2002).Optimal duration of exclusive breastfeeding. [107 refs] Cochrane Database of Systematic Reviews. (1):CD003517.
- Petrova, A., Hegyi, T., & Mehta, R. (2007). Maternal race/ethnicity and one-month exclusive breastfeeding in association with the in-hospital feeding modality. *Breastfeeding Medicine*. 2(2):92-8.
- Shealy, K.R., Li, R., Benton-Davis, S., & Grummer-Strawn, L.M. (2005).The CDC guide to breastfeeding interventions. Atlanta, GA: US Department of Health and Human Services, CDC. Available at: http://www.cdc.gov/breastfeeding/pdf/breastfeeding_interventions.pdf .
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- US Department of Health and Human Services. (2007). Healthy People 2010 Midcourse Review. Washington, DC: US Department of Health and Human Services. Available at: https://www.healthypeople.gov/2010/data/midcourse/html/default.htm?visit=1
- World Health Organization. (2007). Indicators for assessing infant and young child feeding practices. Washington, DC, USA: World Health Organization. Available at: http://apps.who.int/iris/bitstream/10665/43895/1/9789241596664_eng.pdf

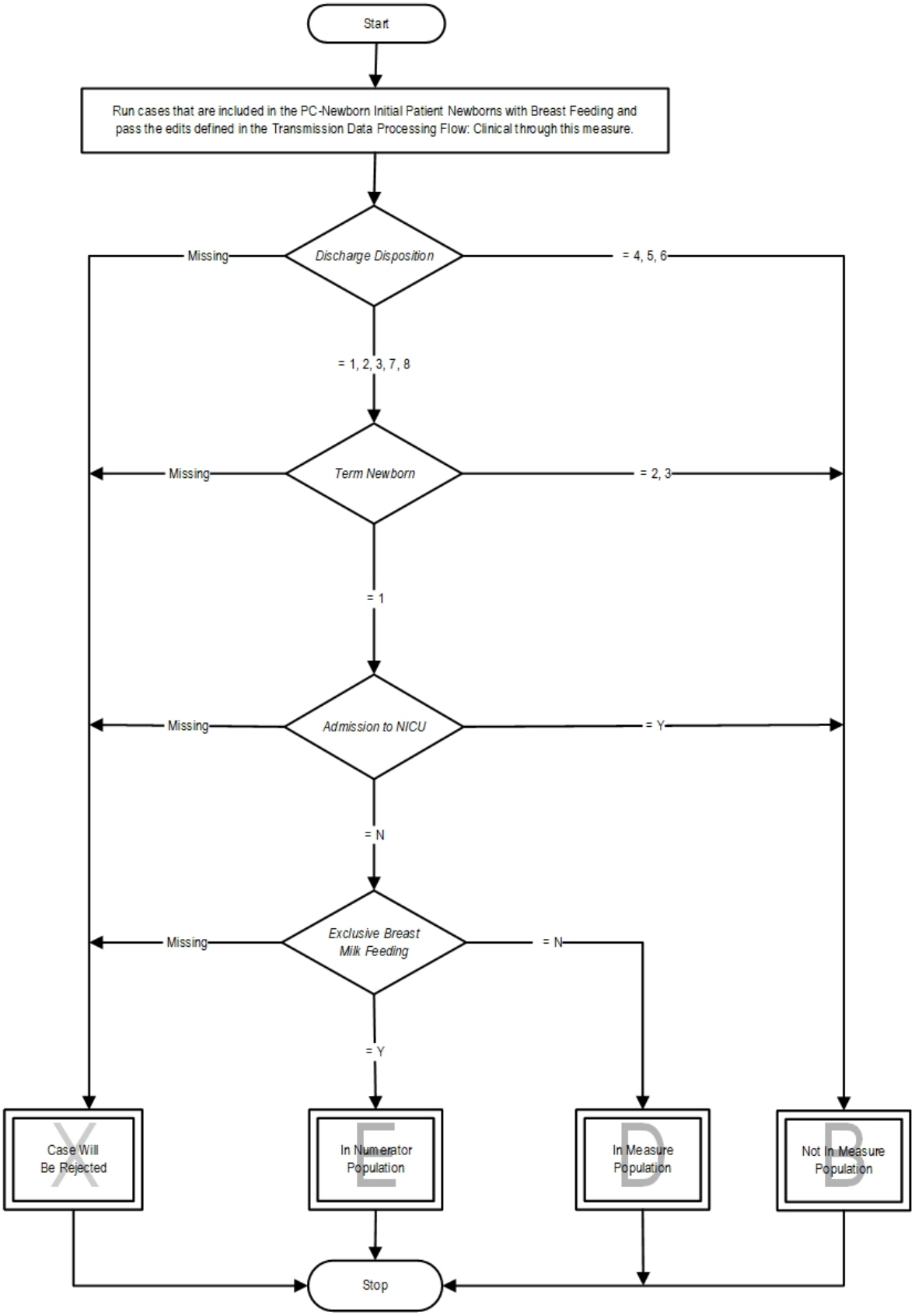
Original Performance Measure Source / Developer:
California Maternal Quality Care Collaborative

Measure Algorithm:

PC-05: Exclusive Breast Milk Feeding

Numerator: Newborns that were fed breast milk only since birth

Denominator: Single term newborns discharged alive from the hospital



Specifications Manual for Joint Commission National Quality Measures (v2019A)
Discharges 07-01-19 (3Q19) through 12-31-19 (4Q19)

 Questions? Ask Question to Joint Commission staff

Fluoride Varnish

Rhode Island Department of Health

A. DESCRIPTION

The percentage of children who received a fluoride varnish application in primary care in the 12 months preceding their first, second, or third birthday.

Guidance for Reporting:

- This measure includes three age-specific indicators assessing whether children are screened by their first, second or third birthdays. Four rates, one for each age group and a combined rate, are to be calculated and reported.

B. ELIGIBLE POPULATION

Age	Children who turn 1, 2, or 3 years of age between January 1 and December 31 of the measurement year.
Continuous Enrollment	Children who are enrolled continuously for 12 months prior to the child's 1st, 2nd, or 3rd birthday
Allowable Gap	No more than one gap in enrollment of up to 45 days during the measurement year. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the beneficiary may not have more than a 1-month gap in coverage (i.e., a beneficiary whose coverage lapses for 2 months or 60 days is not considered continuously enrolled).
Benefit	Medical
Event/Diagnosis	None

C. DATA SOURCE

C.1 – Administrative Specifications

Denominator

Denominator 1: The children in the eligible population who turned 1 during the measurement year.

Denominator 2: The children in the eligible population who turned 2 during the measurement year.

Denominator 3: The children in the eligible population who turned 3 during the measurement year.

Denominator 4: All children in the eligible population who turned 1, 2, or 3 during the measurement year, i.e., the sum of denominators 1, 2, and 3.

Numerators

The numerators identify children who received a fluoride varnish application by a medical practice. National recommendations call for application among young children. The measure is based on three, age-specific indicators.

Numerator 1: Children in Denominator 1 who had a claim with CPT code 99188 or CDT code D1206 billed by a medical practice by their first birthday.

Numerator 2: Children in Denominator 2 who had a claim with CPT code 99188 or CDT code D1206 billed by a medical practice after their first and before or on their second birthdays.

Numerator 3: Children in Denominator 3 who had a claim with CPT code 99188 or CDT code D1206 billed by a medical practice after their second and before or on their third birthdays.

Numerator 4: Children in the entire eligible population who had claim with CPT code 99188 or CDT code D1206 billed by a medical practice in the 12 months preceding their 1st, 2nd, or 3rd birthday (the sum of numerators 1, 2 and 3).

Claims data: CPT code 99188 (application of topical fluoride varnish by a physician or other qualified health care professional) or CDT code D1206 (topical application of fluoride varnish) when billed by a medical practice.

C.2 – Medical Record Specifications

Denominator

A systematic sample of 411 drawn from the eligible population stratified by age.

Denominator 1: 137 children from the sample who turned 1 during the measurement year.

Denominator 2: 137 children from the sample who turned 2 during the measurement year.

Denominator 3: 137 children from the sample who turned 3 during the measurement year.

Denominator 4: The entire sample of 411 children.

Numerators

Numerator 1: Children in Denominator 1 who had received a fluoride varnish application that was documented by their first birthday

Numerator 2: Children in Denominator 2 who had received a fluoride varnish application that was documented after their first and before or on their second birthday

Numerator 3: Children in Denominator 3 who received a fluoride varnish application that was documented after their second and before or on their third birthday

Numerator 4: Children in Denominator 4 who had received a fluoride varnish application that was documented in the 12 months preceding their first, second or third birthday (the sum of numerators 1, 2 and 3).

Documentation in the medical record must include all of the following:

- A note indicating the date on which the test was performed, and
- Evidence of a fluoride varnish application

D. EXCLUSIONS

None.

E. CALCULATION ALGORITHM

Step 1:

Determine the denominators.

From the total denominator, sort into three age cohorts: children who turned one, two or three years of age between January 1 and December 31 of the measurement year.

Step 2:

Determine the numerators.

For each age cohort, and for the total, identify children who had received a fluoride varnish application by their birthday as found through claims data or documented in the medical chart.

Claims Data:

Children for whom a claim of 99188 or D1206 billed by a medical practice was submitted for services in the 12 months preceding their birthday.

Medical Record:

Children who had documentation in the medical record of receiving a fluoride varnish application, validated tool in the 12 months preceding their birthday.

Documentation must include the date of screening and evidence that the fluoride varnish application was completed.

Step 3:

Calculate the age-specific indicators (ages 1 to 3) by dividing the age-specific numerator by the age-specific denominator and multiplying by 100 to get a percentage.

Step 4: Create the overall measure of screening based on the age-specific numerators and denominators.

Total Numerator: Numerator 1 + Numerator 2 + Numerator 3

Total Denominator: Denominator 1 + Denominator 2 + Denominator 3

Sampling Methodology

If administrative data are used, the entire eligible population is used for the denominator. If using the hybrid method (administrative plus medical record data sources), a systematic sample can be drawn of 411, with 137 in each age group.

F. OPTIONAL AGE-SPECIFIC OVERSAMPLING FOR THE DENOMINATOR

A sample of 411 will provide sufficient statistical power for states reporting a state-wide developmental screening rate for children ages 1 to 3. With the smaller age-specific samples, the confidence intervals around the age-specific rates will be larger. Because states will want to use this measure to improve screening rates, age-specific rates may help states to target their efforts. Some states may wish to augment the sample in order to monitor screening rates for a particular age group; compare screening rates for a particular age group with that in other states; or look within an age group at subgroups, defined by race/ethnicity, geographic region, or language. For these applications, the age-specific sample of 137 maybe insufficient, and the state may need a larger sample to obtain statistically meaningful results. The size of the sample required depends on the use of the data, so consultation with a statistician is recommended. The following instructions guide the development of an oversample.

The eligible population, from which the original sample was drawn, should be stratified by age, and the age-specific sample drawn from within each stratum. To oversample for any age group, the state should return to the original listing of eligible children in that age group, and continue adding children to the sample until the larger sample is complete. However, in order to maintain consistency of reporting and avoid having to weight the age groups to calculate the total, the state should only include the first 137 children sampled in the age-specific and total rates.

Follow-Up After Emergency Department Visit for Mental Illness (FUM)

SUMMARY OF CHANGES TO HEDIS 2020

- Removed "with or without a telehealth modifier" language; refer to *General Guideline 43*.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of emergency department (ED) visits for members 6 years of age and older with a principal diagnosis of mental illness or intentional self-harm, who had a follow-up visit for mental illness. Two rates are reported:

1. The percentage of ED visits for which the member received follow-up within 30 days of the ED visit (31 total days).
2. The percentage of ED visits for which the member received follow-up within 7 days of the ED visit (8 total days).

Eligible Population

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicaid, Medicare (report each product line separately).
Ages	6 years and older as of the date of the ED visit. Report three age stratifications and total rate: • 6–17 years. • 18–64 years. • 65 years and older. • Total. The total is the sum of the age stratifications.
Continuous enrollment	Date of the ED visit through 30 days after the ED visit (31 total days).
Allowable gap	No gaps in enrollment.
Anchor date	None.
Benefit	Medical and mental health.
Event/diagnosis	An ED visit (ED Value Set) with a principal diagnosis of mental illness or intentional self-harm (Mental Illness Value Set; Intentional Self-Harm Value Set) on or between January 1 and December 1 of the measurement year where the member was 6 years or older on the date of the visit. The denominator for this measure is based on ED visits, not on members. If a member has more than one ED visit, identify all eligible ED visits between January 1 and December 1 of the measurement year and do not include more than one visit per 31-day period as described below.

Multiple visits in a 31-day period If a member has more than one ED visit in a 31-day period, include only the first eligible ED visit. For example, if a member has an ED visit on January 1 then include the January 1 visit and do not include ED visits that occur on or between January 2 and January 31; then, if applicable, include the next ED visit that occurs on or after February 1. Identify visits chronologically including only one per 31-day period.

Note: *Removal of multiple visits in a 31-day period is based on* ***eligible*** *visits. Assess each ED visit for exclusions before removing multiple visits in a 31-day period.*

ED visits followed by inpatient admission Exclude ED visits that result in an inpatient stay and ED visits followed by admission to an acute or nonacute inpatient care setting on the date of the ED visit or within the 30 days after the ED visit (31 total days), regardless of principal diagnosis for the admission. To identify admissions to an acute or nonacute inpatient care setting:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission date for the stay.

These events are excluded from the measure because admission to an acute or nonacute inpatient setting may prevent an outpatient follow-up visit from taking place.

Administrative Specification

Denominator The eligible population.

Numerators

30-Day Follow-Up A follow-up visit with any practitioner, with a principal diagnosis of a mental health disorder or with a principal diagnosis of intentional self-harm and any diagnosis of a mental health disorder within 30 days after the ED visit (31 total days). Include visits that occur on the date of the ED visit.

7-Day Follow-Up A follow-up visit with any practitioner, with a principal diagnosis of a mental health disorder or with a principal diagnosis of intentional self-harm and any diagnosis of a mental health disorder within 7 days after the ED visit (8 total days). Include visits that occur on the date of the ED visit.

For both indicators, any of the following meet criteria for a follow-up visit.

- An outpatient visit (Visit Setting Unspecified Value Set ***with*** Outpatient POS Value Set) ***with*** a principal diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- An outpatient visit (BH Outpatient Value Set) ***with*** a principal diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- An intensive outpatient encounter or partial hospitalization (Visit Setting Unspecified Value Set ***with*** Partial Hospitalization POS Value Set), ***with*** a principal diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- An intensive outpatient encounter or partial hospitalization (Partial Hospitalization or Intensive Outpatient Value Set) ***with*** a principal diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).

- A community mental health center visit (Visit Setting Unspecified Value Set ***with*** Community Mental Health Center POS Value Set), ***with*** a principal diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- Electroconvulsive therapy (Electroconvulsive Therapy Value Set) ***with*** (Ambulatory Surgical Center POS Value Set; Community Mental Health Center POS Value Set; Outpatient POS Value Set; Partial Hospitalization POS Value Set) ***with*** a principal diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- A telehealth visit (Visit Setting Unspecified Value Set ***with*** Telehealth POS Value Set), ***with*** a principal diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- An observation visit (Observation Value Set) ***with*** a principal diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- An outpatient visit (Visit Setting Unspecified Value Set ***with*** Outpatient POS Value Set) ***with*** a principal diagnosis of intentional self-harm (Intentional Self-Harm Value Set), ***with*** any diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- An outpatient visit (BH Outpatient Value Set) ***with*** a principal diagnosis of intentional self-harm (Intentional Self-Harm Value Set), ***with*** any diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- An intensive outpatient encounter or partial hospitalization (Visit Setting Unspecified Value Set ***with*** Partial Hospitalization POS Value Set), ***with*** a principal diagnosis of intentional self-harm (Intentional Self-Harm Value Set), ***with*** any diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- An intensive outpatient encounter or partial hospitalization (Partial Hospitalization or Intensive Outpatient Value Set) ***with*** a principal diagnosis of intentional self-harm (Intentional Self-Harm Value Set), ***with*** any diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- A community mental health center visit (Visit Setting Unspecified Value Set ***with*** Community Mental Health Center POS Value Set), ***with*** a principal diagnosis of intentional self-harm (Intentional Self-Harm Value Set), ***with*** any diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- Electroconvulsive therapy (Electroconvulsive Therapy Value Set) ***with*** (Ambulatory Surgical Center POS Value Set; Community Mental Health Center POS Value Set; Outpatient POS Value Set; Partial Hospitalization POS Value Set) ***with*** a principal diagnosis of intentional self-harm (Intentional Self-Harm Value Set), ***with*** any diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- A telehealth visit (Visit Setting Unspecified Value Set ***with*** Telehealth POS Value Set), ***with*** a principal diagnosis of intentional self-harm (Intentional Self-Harm Value Set), ***with*** any diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).
- An observation visit (Observation Value Set) ***with*** a principal diagnosis of intentional self-harm (Intentional Self-Harm Value Set), ***with*** any diagnosis of a mental health disorder (Mental Health Diagnosis Value Set).

Note

- *Organizations may have different methods for billing intensive outpatient visits and partial hospitalizations. Some methods may be comparable to outpatient billing, with separate claims for each date of service; others may be comparable to inpatient billing, with an admission date, a discharge date and units of service. Organizations whose billing methods are comparable to inpatient billing may count each unit of service as an individual visit. The unit of service must have occurred during the required period for the rate (i.e., within 30 days after the ED visit or within 7 days after the ED visit).*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table FUM-1/2/3: Data Elements for Follow-Up After Emergency Department Visit for Mental Illness

	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	*For each age stratification and total*
Numerator events by administrative data	*Each of the 2 rates for each age stratification and total*
Numerator events by supplemental data	*Each of the 2 rates for each age stratification and total*
Reported rate	*Each of the 2 rates for each age stratification and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Follow-Up After Emergency Department Visit for Mental Illness

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes	Age determination dates may be changed (i.e., age 6 as of the date of the ED visit). Changing the denominator age range is allowed.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	Yes, with limits	Only events or diagnoses that contain (or map to) codes in the value sets may be used to identify visits with a diagnosis. Value sets and logic may not be changed. *Note: Organizations may assess at the member level by applying measure logic appropriately (i.e., percentage of members with documentation of an emergency department visit with a principal diagnosis of mental illness or intentional self-harm, who had a follow-up visit for mental illness).*
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	The optional exclusions are not required, but if they are used, only the specified exclusions may be applied and the value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• 30-Day Follow-Up • 7-Day Follow-Up	No	Value sets and logic may not be changed.

Follow-Up After Hospitalization for Mental Illness (FUH)

SUMMARY OF CHANGES TO HEDIS 2020

- Added the Mental Health Practitioner Value Set to make the measure compatible with digital measure formatting.
- Clarified that the diagnosis must be on the discharge claim when identifying the event/diagnosis and direct transfers.
- Removed "with or without a telehealth modifier" language; refer to *General Guideline 43*.
- Added a *Note* to address mapping providers to the codes in the Mental Health Practitioner Value Set.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of discharges for members 6 years of age and older who were hospitalized for treatment of selected mental illness or intentional self-harm diagnoses and who had a follow-up visit with a mental health practitioner. Two rates are reported:

1. The percentage of discharges for which the member received follow-up within 30 days after discharge.
2. The percentage of discharges for which the member received follow-up within 7 days after discharge.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice*.

Product lines	Commercial, Medicaid, Medicare (report each product line separately).
Ages	6 years and older as of the date of discharge. Report three age stratifications and total rate: • 6–17 years. • 18–64 years. • 65 years and older. • Total.
Continuous enrollment	The total is the sum of the age stratifications. Date of discharge through 30 days after discharge.
Allowable gap	No gaps in enrollment.
Anchor date	None.
Benefits	Medical and mental health (inpatient and outpatient).
Event/diagnosis	An acute inpatient discharge with a principal diagnosis of mental illness or intentional self-harm (Mental Illness Value Set; Intentional Self-Harm Value Set) on the discharge claim on or between January 1 and December 1 of the measurement year. To identify acute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the discharge date for the stay.

The denominator for this measure is based on discharges, not on members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year.

Acute readmission or direct transfer

Identify readmissions and direct transfers to an acute inpatient care setting during the 30-day follow-up period:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.

Exclude both the initial discharge and the readmission/direct transfer discharge if the last discharge occurs after December 1 of the measurement year.

If the readmission/direct transfer to the acute inpatient care setting was for a principal diagnosis (use only the principal diagnosis on the discharge claim) of mental health disorder or intentional self-harm (Mental Health Diagnosis Value Set; Intentional Self-Harm Value Set), count only the last discharge.

If the readmission/direct transfer to the acute inpatient care setting was for any other principal diagnosis (use only the principal diagnosis on the discharge claim) exclude both the original and the readmission/direct transfer discharge.

Nonacute readmission or direct transfer

Exclude discharges followed by readmission or direct transfer to a nonacute inpatient care setting within the 30-day follow-up period, regardless of principal diagnosis for the readmission. To identify readmissions and direct transfers to a nonacute inpatient care setting:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim.
3. Identify the admission date for the stay.

These discharges are excluded from the measure because rehospitalization or direct transfer may prevent an outpatient follow-up visit from taking place.

Administrative Specification

Denominator The eligible population.

Numerators

30-Day Follow-Up A follow-up visit with a mental health practitioner within 30 days after discharge. Do not include visits that occur on the date of discharge.

7-Day Follow-Up A follow-up visit with a mental health practitioner within 7 days after discharge. Do not include visits that occur on the date of discharge.

For both indicators, any of the following meet criteria for a follow-up visit.

- An outpatient visit (Visit Setting Unspecified Value Set) ***with*** (Outpatient POS Value Set) ***with*** a mental health practitioner (Mental Health Practitioner Value Set).
- An outpatient visit (BH Outpatient Value Set) ***with*** a mental health practitioner (Mental Health Practitioner Value Set).
- An intensive outpatient encounter or partial hospitalization (Visit Setting Unspecified Value Set) ***with*** (Partial Hospitalization POS Value Set) ***with*** a mental health practitioner (Mental Health Practitioner Value Set).
- An intensive outpatient encounter or partial hospitalization (Partial Hospitalization or Intensive Outpatient Value Set) ***with*** a mental health practitioner (Mental Health Practitioner Value Set).
- A community mental health center visit (Visit Setting Unspecified Value Set) ***with*** (Community Mental Health Center POS Value Set) ***with*** a mental health practitioner (Mental Health Practitioner Value Set).
- Electroconvulsive therapy (Electroconvulsive Therapy Value Set) ***with*** (Ambulatory Surgical Center POS Value Set; Community Mental Health Center POS Value Set; Outpatient POS Value Set; Partial Hospitalization POS Value Set) ***with*** a mental health practitioner (Mental Health Practitioner Value Set).
- A telehealth visit: (Visit Setting Unspecified Value Set) ***with*** (Telehealth POS Value Set) ***with*** a mental health practitioner (Mental Health Practitioner Value Set).
- An observation visit (Observation Value Set) ***with*** a mental health practitioner (Mental Health Practitioner Value Set).
- Transitional care management services (Transitional Care Management Services Value Set), ***with*** a mental health practitioner (Mental Health Practitioner Value Set).

Note

- *Organizations may have different methods for billing intensive outpatient visits and partial hospitalizations. Some methods may be comparable to outpatient billing, with separate claims for each date of service; others may be comparable to inpatient billing, with an admission date, a discharge date and units of service. Organizations whose billing methods are comparable to inpatient billing may count each unit of service as an individual visit. The unit of service must have occurred during the required period for the rate (e.g., within 30 days after discharge or within 7 days after discharge).*
- *If an organization does not use the codes in the Mental Health Practitioner Value Set, it must map providers to a code in the value set for reporting. Only providers who meet the definition of mental health practitioner (refer to Appendix 3) are eligible to be mapped. Mapping is subject to review by the HEDIS auditor.*
- *Refer to Appendix 3 for the definition of* mental health practitioner.

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table FUH-1/2/3: Data Elements for Follow-Up After Hospitalization for Mental Illness

	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	*For each age stratification and total*
Numerator events by administrative data	*Each of the 2 rates for each age stratification and total*
Numerator events by supplemental data	*Each of the 2 rates for each age stratification and total*
Reported rate	*Each of the 2 rates for each age stratification and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Follow-Up After Hospitalization for Mental Illness

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes	The age determination dates may be changed (e.g., select, "age as of June 30"). Changing the denominator age range is allowed.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	Yes, with limits	Only events or diagnoses that contain (or map to) codes in the value sets may be used to identify inpatient stays and diagnoses. Value sets and logic may not be changed. ***Note:*** *Organizations may assess at the member level (vs. discharge level) by applying measure logic appropriately (i.e., percentage of members who were hospitalized for treatment of selected mental illness or intentional self-harm diagnoses who had a follow-up visit with a mental health practitioner).*
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	The optional exclusions are not required, but if they are used, only the specified exclusions may be applied and the value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• 30-Day Follow-Up • 7-Day Follow-Up	No	Value sets and logic may not be changed.

Follow-Up After Emergency Department Visit for Alcohol and Other Drug Abuse or Dependence (FUA)

SUMMARY OF CHANGES TO HEDIS 2020

- Removed "with or without a telehealth modifier" language; refer to *General Guideline 43*.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of emergency department (ED) visits for members 13 years of age and older with a principal diagnosis of alcohol or other drug (AOD) abuse or dependence, who had a follow up visit for AOD. Two rates are reported:

1. The percentage of ED visits for which the member received follow-up within 30 days of the ED visit (31 total days).
2. The percentage of ED visits for which the member received follow-up within 7 days of the ED visit (8 total days).

Eligible Population

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicaid, Medicare (report each product line separately).
Ages	13 years and older as of the ED visit. Report two age stratifications and a total rate. • 13–17 years. • 18 and older. • Total. The total is the sum of the age stratifications.
Continuous enrollment	Date of the ED visit through 30 days after the ED visit (31 total days).
Allowable gap	No gaps in enrollment.
Anchor date	None.
Benefit	Medical and chemical dependency. ***Note:*** *Members with detoxification-only chemical dependency benefits do not meet these criteria.*

Event/diagnosis An ED visit (ED Value Set) with a principal diagnosis of AOD abuse or dependence (AOD Abuse and Dependence Value Set) on or between January 1 and December 1 of the measurement year where the member was 13 years or older on the date of the visit.

The denominator for this measure is based on ED visits, not on members. If a member has more than one ED visit, identify all eligible ED visits between January 1 and December 1 of the measurement year and do not include more than one visit per 31-day period as described below.

Multiple visits in a 31-day period If a member has more than one ED visit in a 31-day period, include only the first eligible ED visit. For example, if a member has an ED visit on January 1, then include the January 1 visit and do not include ED visits that occur on or between January 2 and January 31; then, if applicable, include the next ED visit that occurs on or after February 1. Identify visits chronologically including only one per 31-day period.

Note: *Removal of multiple visits in a 31-day period is based on* ***eligible*** *visits. Assess each ED visit for exclusions before removing multiple visits in a 31-day period.*

ED visits followed by inpatient admission Exclude ED visits that result in an inpatient stay and ED visits followed by an admission to an acute or nonacute inpatient care setting on the date of the ED visit or within the 30 days after the ED visit, regardless of principal diagnosis for the admission. To identify admissions to an acute or nonacute inpatient care setting:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission date for the stay.

These events are excluded from the measure because admission to an acute or nonacute inpatient setting may prevent an outpatient follow-up visit from taking place.

Administrative Specification

Denominator The eligible population.

Numerators

30-Day Follow-Up A follow-up visit with any practitioner, with a principal diagnosis of AOD within 30 days after the ED visit (31 total days). Include visits that occur on the date of the ED visit.

7-Day Follow-Up A follow-up visit with any practitioner, with a principal diagnosis of AOD within 7 days after the ED visit (8 total days). Include visits that occur on the date of the ED visit.

For both indicators, any of the following meet criteria for a follow-up visit:

- IET Stand Alone Visits Value Set with a principal diagnosis of AOD abuse or dependence (AOD Abuse and Dependence Value Set).
- IET Visits Group 1 Value Set ***with*** IET POS Group 1 Value Set and a principal diagnosis of AOD abuse or dependence (AOD Abuse and Dependence Value Set).

- IET Visits Group 2 Value Set ***with*** IET POS Group 2 Value Set and a principal diagnosis of AOD abuse or dependence (AOD Abuse and Dependence Value Set).
- An observation visit (Observation Value Set) with a principal diagnosis of AOD abuse or dependence (AOD Abuse and Dependence Value Set).
- A telephone visit (Telephone Visits Value Set) with a principal diagnosis of AOD abuse or dependence (AOD Abuse and Dependence Value Set).
- An online assessment (Online Assessments Value Set) with a principal diagnosis of AOD abuse or dependence (AOD Abuse and Dependence Value Set).

Note

- *Organizations may have different methods for billing intensive outpatient visits and partial hospitalizations. Some methods may be comparable to outpatient billing, with separate claims for each date of service; others may be comparable to inpatient billing, with an admission date, a discharge date and units of service. Organizations whose billing methods are comparable to inpatient billing may count each unit of service as an individual visit. The unit of service must have occurred during the required period for the rate (i.e., within 30 days after the ED visit or within 7 days after the ED visit).*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table FUA-1/2/3: Data Elements for Follow-Up After Emergency Department Visit for Alcohol and Other Drug Abuse or Dependence

	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	*For each age stratification and total*
Numerator events by administrative data	*Each of the 2 rates for each age stratification and total*
Numerator events by supplemental data	*Each of the 2 rates for each age stratification and total*
Reported rate	*Each of the 2 rates for each age stratification and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Follow-Up After Emergency Department Visit for AOD Abuse or Dependence

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes	The age determination date(s) may be changed (i.e., age 13 as of ED visit). Changing denominator age range is allowed.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	Yes, with limits	Only events and diagnoses that contain (or map to) codes in the value sets may be used to identify visits with a diagnosis. Value sets and logic may not be changed. ***Note:*** *Organizations may assess at the member level by applying measure logic appropriately (i.e., percentage of members with documentation of an emergency department visit with a principal diagnosis of alcohol or other drug (AOD) abuse or dependence who had a follow up visit for AOD).*
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required; however, if they are used, only the specified exclusions may be applied and the value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• 30-Day Follow-Up • 7-Day Follow-Up	No	Value sets and logic may not be changed.

Follow-Up Care for Children Prescribed ADHD Medication (ADD)

SUMMARY OF CHANGES TO HEDIS 2020

- Updated the exclusions (step 4) for both rates.
- Clarified in the continuous enrollment criteria of Rate 2 how to handle members who switch between products.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of children newly prescribed attention-deficit/hyperactivity disorder (ADHD) medication who had at least three follow-up care visits within a 10-month period, one of which was within 30 days of when the first ADHD medication was dispensed. Two rates are reported.

1. *Initiation Phase.* The percentage of members 6–12 years of age as of the IPSD with an ambulatory prescription dispensed for ADHD medication, who had one follow-up visit with practitioner with prescribing authority during the 30-day Initiation Phase.
2. *Continuation and Maintenance (C&M) Phase.* The percentage of members 6–12 years of age as of the IPSD with an ambulatory prescription dispensed for ADHD medication, who remained on the medication for at least 210 days and who, in addition to the visit in the Initiation Phase, had at least two follow-up visits with a practitioner within 270 days (9 months) after the Initiation Phase ended.

Definitions

Intake Period	The 12-month window starting March 1 of the year prior to the measurement year and ending the last calendar day of February of the measurement year.
Negative Medication History	A period of 120 days (4 months) prior to the IPSD when the member had no ADHD medications dispensed for either new or refill prescriptions.
IPSD	Index Prescription Start Date. The earliest prescription dispensing date for an ADHD medication where the date is in the Intake Period and there is a Negative Medication History.
Initiation Phase	The 30 days following the IPSD.
C&M Phase	The 300 days following the IPSD (10 months).
New Episode	The member must have a 120-day (4-month) Negative Medication History on or before the IPSD.
Continuous Medication Treatment	The number of medication treatment days during the 10-month follow-up period must be ≥210 days (i.e., 300 treatment days – 90 gap days).
Treatment days (covered days)	The actual number of calendar days covered with prescriptions within the specified 300-day measurement interval (e.g., a prescription of a 90 days supply dispensed on the 220th day will have 80 days counted in the 300-day interval).

Eligible Population: Rate 1—Initiation Phase

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product lines Commercial, Medicaid (report each product line separately).

Ages Six years as of March 1 of the year prior to the measurement year to 12 years as of the last calendar day of February of the measurement year.

Continuous enrollment 120 days (4 months) prior to the IPSD through 30 days after the IPSD.

Allowable gap None.

Anchor date None.

Benefits Medical and pharmacy.

Event/diagnosis Follow the steps below to identify the eligible population for the Initiation Phase.

Step 1 Identify all children in the specified age range who were dispensed an ADHD medication (ADHD Medications List) during the 12-month Intake Period.

ADHD Medications

Description	Prescription		
CNS stimulants	• Amphetamine-dextroamphetamine • Dexmethylphenidate	• Dextroamphetamine • Lisdexamfetamine	• Methylphenidate • Methamphetamine
Alpha-2 receptor agonists	• Clonidine	• Guanfacine	
Miscellaneous ADHD medications	• Atomoxetine		

Step 2 Test for Negative Medication History. For each member identified in step 1, test each ADHD prescription for a Negative Medication History. The IPSD is the dispensing date of the earliest ADHD prescription in the Intake Period with a Negative Medication History.

Step 3 Calculate continuous enrollment. Members must be continuously enrolled for 120 days (4 months) prior to the IPSD through 30 days after the IPSD.

Step 4 Exclude members who had an acute inpatient encounter for a mental, behavioral or neurodevelopmental disorder during the 30 days after the IPSD. Either of the following meet criteria:

- An acute inpatient encounter (Acute Inpatient Value Set) with a principal diagnosis of mental, behavioral or neurodevelopmental disorder (Mental, Behavioral and Neurodevelopmental Disorders Value Set).
- An acute inpatient discharge with a principal diagnosis of mental, behavioral or neurodevelopmental disorder (Mental, Behavioral and Neurodevelopmental Disorders Value Set). To identify an acute inpatient discharge:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the discharge date for the stay.

Administrative Specification: *Rate 1—Initiation Phase*

Denominator The Rate 1 eligible population.

Numerator An outpatient, intensive outpatient or partial hospitalization follow-up visit with a practitioner with prescribing authority, within 30 days after the IPSD. Any of the following code combinations billed by a practitioner with prescribing authority meet criteria:

- An outpatient visit (Visit Setting Unspecified Value Set ***with*** Outpatient POS Value Set).
- An outpatient visit (BH Outpatient Value Set).
- An observation visit (Observation Value Set).
- A health and behavior assessment or intervention (Health and Behavior Assessment or Intervention Value Set).
- An intensive outpatient encounter or partial hospitalization (Visit Setting Unspecified Value Set ***with*** Partial Hospitalization POS Value Set).
- An intensive outpatient encounter or partial hospitalization (Partial Hospitalization or Intensive Outpatient Value Set).
- A community mental health center visit (Visit Setting Unspecified Value Set ***with*** Community Mental Health Center POS Value Set).

Note:

- *Do not count a visit on the IPSD as the Initiation Phase visit.*
- *Do not count visits billed with a telehealth modifier (Telehealth Modifier Value Set) or billed with a telehealth POS code (Telehealth POS Value Set).*

Eligible Population: *Rate 2—C&M Phase*

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product lines Commercial, Medicaid (report each product line separately).

Ages Six years as of March 1 of the year prior to the measurement year to 12 years as of the last calendar day of February of the measurement year.

Continuous enrollment Members must be continuously enrolled in the organization for 120 days (4 months) prior to the IPSD and 300 days (10 months) after the IPSD.

Members who switch product lines or products between the Rate 1 and Rate 2 continuous enrollment periods are only included in Rate 1. However, if an organization reports products combined, then a member who switches between those products (e.g., the products included in the HEDIS reporting entity) is

included in both rates. For example, if an organization reports HMO and POS products combined and a member switches from HMO to POS between the Rate 1 and Rate 2 continuous enrollment period, the member is included in both Rate 1 and Rate 2.

Allowable gap One 45-day gap in enrollment between 31 days and 300 days (10 months) after the IPSD. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).

Anchor date None.

Benefits Medical and pharmacy.

Event/diagnosis Follow the steps below to identify the eligible population for the C&M Phase.

Step 1 Identify all members who meet the eligible population criteria for Rate 1—Initiation Phase.

Step 2 Calculate continuous enrollment. Members must be continuously enrolled in the organization for 120 days (4 months) prior to the IPSD and 300 days (10 months) after the IPSD.

Step 3 Calculate the continuous medication treatment. Using the members in step 2, determine if the member filled a sufficient number of prescriptions to provide continuous treatment for at least 210 days out of the 300-day period after the IPSD. The definition of "continuous medication treatment" allows gaps in medication treatment, up to a total of 90 days during the 300-day (10-month) period. (This period spans the Initiation Phase [1 month] and the C&M Phase [9 months].)

Gaps can include either washout period gaps to change medication or treatment gaps to refill the same medication.

Regardless of the number of gaps, the total gap days may be no more than 90. Count any combination of gaps (e.g., one washout gap of 14 days and numerous weekend drug holidays).

Step 4 Exclude members who had an acute inpatient encounter for a mental, behavioral or neurodevelopmental disorder during the 300 days (10 months) after the IPSD. Either of the following meet criteria:

- An acute inpatient encounter (Acute Inpatient Value Set) with a principal diagnosis of mental, behavioral or neurodevelopmental disorder (Mental, Behavioral and Neurodevelopmental Disorders Value Set).
- An acute inpatient discharge with a principal diagnosis of mental, behavioral or neurodevelopmental disorder (Mental, Behavioral and Neurodevelopmental Disorders Value Set). To identify an acute inpatient discharge:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
  3. Identify the discharge date for the stay.

Administrative Specification: *Rate 2—C&M Phase*

Denominator The Rate 2 eligible population.

Numerator Identify all members who meet the following criteria:

- Numerator compliant for *Rate 1—Initiation Phase,* ***and***
- At least two follow-up visits on different dates of service with any practitioner, from 31–300 days (9 months) after the IPSD.

Only one of the two visits (during days 31–300) may be a telephone visit (Telephone Visits Value Set) or a telehealth visit.

Identify follow-up visits using the code combinations below, then identify telehealth visits by the presence of a telehealth modifier (Telehealth Modifier Value Set) or the presence of a telehealth POS code (Telehealth POS Value Set) on the claim.

Any of the following code combinations identify follow-up visits:

- An outpatient visit (Visit Setting Unspecified Value Set ***with*** Outpatient POS Value Set).
- An outpatient visit (BH Outpatient Value Set).
- An observation visit (Observation Visit Value Set).
- A health and behavior assessment or intervention (Health and Behavior Assessment or Intervention Value Set).
- An intensive outpatient encounter or partial hospitalization (Visit Setting Unspecified Value Set ***with*** Partial Hospitalization POS Value Set).
- An intensive outpatient encounter or partial hospitalization (Partial Hospitalization or Intensive Outpatient Value Set).
- A community mental health center visit (Visit Setting Unspecified Value Set ***with*** Community Mental Health Center POS Value Set).
- A telehealth visit (Visit Setting Unspecified Value Set ***with*** Telehealth POS Value Set).
- A telephone visit (Telephone Visits Value Set).

Exclusions *(optional)*

Exclude from the denominator for both rates, members with a diagnosis of narcolepsy (Narcolepsy Value Set) any time during their history through December 31 of the measurement year.

Note

- *For members who have multiple overlapping prescriptions, count the overlap days once toward the days supply (whether the overlap is for the same drug or for a different drug).*
- *Refer to Appendix 3 for the definition of prescribing practitioner.*
- *Organizations may have different methods for billing intensive outpatient encounters and partial hospitalizations. Some methods may be comparable to outpatient billing, with separate claims for each date of service; others may be comparable to inpatient billing, with an admission date, a discharge date and units of service. Organizations whose billing methods are comparable to inpatient billing may count each unit of service as an individual visit. The unit of service must have*

occurred during the period required for the rate (e.g., within 30 days after or from 31–300 days after the IPSD).

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table ADD-1/2: Data Elements for Follow-Up Care for Children Prescribed ADHD Medication

	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	*Each of the 2 rates*
Number of optional exclusions	*Each of the 2 rates*
Numerator events by administrative data	*Each of the 2 rates*
Numerator events by supplemental data	*Each of the 2 rates*
Reported rate	*Each of the 2 rates*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Follow-Up Care for Children Prescribed ADHD Medication

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes	The age determination dates may be changed (e.g., select, "age as of June 30"). Changing the denominator age range is allowed.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Using a benefit is not required; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	Yes, with limits	Only events or diagnoses that contain (or map to) codes in the medication lists and value sets may be used to identify visits. Medication lists, value sets and logic may not be changed. *Note: This measure uses newly prescribed attention-deficit/hyperactivity disorder (ADHD) medication; modifying the measurement period can affect other dates; however, the order and relationship of the events may not be changed.*
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	The optional exclusions are not required, but if they are used, only the specified exclusions may be applied and the value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Initiation Phase	No	Value sets and logic may not be changed.
Continuation and Management Phase	Yes, with limits	Value sets and logic may not be changed. Timing of visit determination may be changed.

2018 All-Cause Hospital Wide Measure Updates and Specifications Report

Hospital-Level 30-Day Risk-Standardized Readmission Measure – Version 7.0

Submitted By:

Yale New Haven Health Services Corporation – Center for Outcomes Research & Evaluation (YNHHSC/CORE)

Prepared For:

Centers for Medicare & Medicaid Services (CMS)

March 2018

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Acknowledgements

This work is a collaborative effort and the authors gratefully acknowledge the Veterans Health Administration (VHA); Mathematica Policy Research; General Dynamics Information Technology; Customer Value Partners; Sharon-Lise Normand from Harvard Medical School, Department of Health Care Policy and Harvard School of Public Health, Department of Biostatistics; Kanchana Bhat, Jinghong Gao, Lori Geary, and Yongfei Wang from CORE; Taybah for Healthcare Consulting, Inc.; and Lein Han and Pierre Yong at the CMS for their contributions to this work.

1. HOW TO USE THIS REPORT

This report describes the Centers for Medicare & Medicaid Services' (CMS's) hospital-wide readmission (HWR) measure used in the Hospital Inpatient Quality Reporting program and publicly reported on Hospital Compare. The measure reports hospital-level 30-day risk-standardized readmission rates (RSRRs) following admission. This report provides a single source of information about this measure for a wide range of readers. Reports describing other outcome measures can be found on *QualityNet*.

This report provides an overview of the measure methodology, methodology updates for 2018 public reporting, and the national results for 2018 public reporting. The appendices provide detailed specifications for the measure, including tables of the codes used for cohort derivation and risk adjustment, as well as a history of annual updates.

Specifically, the report includes:

- **Section 2 - An overview of the HWR measure:**
  - Background
  - Cohort inclusions and exclusions
    - Included and excluded hospitalizations
    - How transferred patients are handled
    - Specialty cohort assignment
  - Unplanned readmission outcome
  - Risk-adjustment variables
  - Data sources
  - Readmission rate calculation
  - Categorization of hospitals' performance score

- **Section 3 - 2018 measure updates**

- **Section 4 - 2018 measure results**

- **Section 5 - Glossary**

The appendices contain detailed measure information, consisting of:

- Appendix A: Statistical approach to calculating RSRRs;
- Appendix B: Data quality assurance (QA);
- Appendix C: Annual updates to the measure since measure development;
- Appendix D: Measure specifications; and,
- Appendix E: Detailed overview of the planned readmission algorithm, including hyperlinks to ICD-10 code lists that are posted in the supplemental Excel file on *QualityNet*.

The original measure methodology report and prior updates and specifications reports are available in the 'Measure Methodology' and 'Archived Resources' sections under the claims-based readmission measures page on *QualityNet*.[1-6]

The measure methodology is also described in the peer-reviewed medical literature.[7,8]

For resources on quality improvement activities aimed at reducing readmission in general, and for more information about the cost and business case for making such improvements, refer to the 'Reducing Readmissions' section under the claims-based readmission measures page on *QualityNet*.

2. BACKGROUND AND OVERVIEW OF MEASURE METHODOLOGY

2.1. Background on HWR Measure

In July 2009, CMS began publicly reporting 30-day RSRRs for acute myocardial infarction (AMI), heart failure (HF), and pneumonia for the nation's non-federal short-term acute care hospitals (including Indian Health Services hospitals) and critical access hospitals. To provide a broader assessment of the quality of care at hospitals, CMS developed the HWR measure, a claims-based, risk-adjusted HWR measure for public reporting that reflects the quality of care for hospitalized patients in the U.S. CMS added the HWR measure to the Hospital Inpatient Quality Reporting program and began publicly reporting the measure in 2013.

Results for the measure are posted and updated annually on Hospital Compare.

CMS contracted with the YNHHSC/CORE to update the HWR measure for 2018 public reporting through a process of measure reevaluation.

2.2. Overview of Measure Methodology

The 2018 risk-adjusted HWR measure uses specifications from the initial measure methodology report with refinements to the measure, as listed in Appendix C and described in the prior measure updates and specifications reports.[1-6] An overview of the methodology is presented in this section.

2.2.1 Cohort

Index Admissions Included in the Measure

An index admission is the hospitalization to which the readmission outcome is attributed and includes admissions for patients:

- Enrolled in Medicare Fee-For-Service (FFS) Part A for the 12 months prior to the date of admission and during the index admission;
- Aged 65 or over;
- Discharged alive from a non-federal short-term acute care hospital; and,
- Not transferred to another acute care facility

See Table D.2, Table D.4, Table D.5, Table D.6, and Table D.7 in Appendix D for specific diagnosis and procedure Agency for Healthcare Research and Quality (AHRQ) Clinical Classification Software (CCS) categories used to define the specialty cohorts included in the measure. Table D.2 also includes singular International Classification of Diseases, 10th Revision, Procedure Coding System (ICD-10-PCS) codes used to define additional cases for the surgery/gynecology specialty cohort.

Index Admissions Excluded from the Measure

This measure excludes index admissions for patients:

- Admitted to Prospective Payment System (PPS)-exempt cancer hospitals;
- Without at least 30 days of post-discharge enrollment in Medicare FFS;
- Discharged against medical advice;
- Admitted for primary psychiatric diagnoses;
- Admitted for rehabilitation; or,
- Admitted for medical treatment of cancer.

Note that patients who do not have a full 30 days of post-discharge enrollment in Medicare FFS due to death are eligible for inclusion in the cohort; this does not represent a change from the original measure methodology. Thus, if a patient had an unplanned readmission and later died, all within 30 days of discharge from the index admission, the case would be captured in the outcome, assuming they met inclusion/exclusion criteria.

It is important to note that a readmission is included as an index admission if it meets all other eligibility criteria. This differs from the publicly reported condition-specific and procedure-specific readmission measures, which do not consider a readmission as a new index admission within the same measure.

As a part of data processing prior to the measure calculation, records are removed for non-short-term acute care facilities, such as psychiatric facilities, rehabilitation facilities, or long-term care hospitals. Additional data-cleaning steps include removing claims with stays longer than one year, claims with overlapping dates, claims for patients not listed in the Medicare enrollment database, and records with invalid provider IDs.

See Table D.1 and Table D.3 in Appendix D for specific AHRQ CCS diagnosis categories excluded from the measure. The percentage of admissions excluded based on each criterion is shown in Section 4 in Figure 4.2.1.

Patients Transferred between Hospitals

The measure considers multiple hospitalizations that result from hospital-to-hospital transfers as a single acute episode of care. Transfer patients are identified by tracking claims for inpatient short-term acute care hospitalizations over time. Admissions to a hospital within one day of discharge from another hospital are considered transfers regardless of whether the first institution indicates intent to transfer the patient in the discharge disposition code or whether the second inpatient admission is for the same condition.

To include an admission in the measure cohort, the patient must ultimately be discharged to a non-acute care setting (for example, to home or a skilled nursing facility). Thus, for patients transferred from one short-term acute care hospital to another, only the last admission in the series of transfers is eligible for inclusion in the cohort. The previous admissions are not included. For example, if a patient is admitted

to Hospital A, transferred to Hospital B, and then discharged from Hospital B to a non-acute care setting, only the Hospital B admission would be included in the cohort, and an unplanned readmission within 30 days of discharge from the Hospital B admission would be captured in Hospital B's readmission outcome.

Specialty Cohort Assignment

Each eligible admission is assigned to one of five mutually exclusive specialty cohorts: medicine, surgery/gynecology, cardiorespiratory, cardiovascular, and neurology. The cohorts reflect how care for patients is organized within hospitals. To assign admissions to cohorts, admissions are first screened for the presence of an eligible AHRQ CCS surgical procedure category or one of the defined singular ICD-10-PCS codes listed in Table D.2. Admissions with an eligible surgical procedure are assigned to the surgical cohort, regardless of the principal discharge diagnosis code of the admission. All remaining admissions are assigned to cohorts based on the AHRQ CCS diagnosis category of the principal discharge diagnosis. Refer to Figure D.1 for more information on the assignment of admissions to specialty cohort groups.

2.2.2 Outcome

All-Cause Unplanned Readmissions

The measure is designed to capture unplanned readmissions that arise from acute clinical events requiring urgent rehospitalization within 30 days of discharge. Only an unplanned inpatient admission to a short-term acute care hospital can qualify as a readmission. Planned readmissions, which are generally not a signal of quality of care, are not considered readmissions in the measure outcome. For details about how planned readmissions are defined, refer to Section 2.2.3 and Appendix E.

All unplanned readmissions are considered an outcome, regardless of cause. There are a number of reasons for assessing unplanned readmissions for all causes in the CMS readmission measures. First, from a patient perspective, an unplanned readmission for any cause is an adverse event. In addition, making inferences about quality of care based solely on the documented cause of readmission is difficult. For example, a patient with renal failure who develops a hospital-acquired infection may ultimately be readmitted for sepsis. In this context, considering the readmission to be unrelated to the care that the patient received for renal failure during the index admission would be inappropriate.

Note that if a patient is readmitted to the **same** hospital on the **same** calendar day of discharge for the **same diagnosis** as the index admission, the measure considers the patient to have had one single continuous admission (that is, one index admission). However, if the condition is **different** from the index admission, this is considered a readmission in the measure.

30-Day Time Frame

The measure assesses unplanned readmissions within a 30-day period from the date of discharge from an index admission. The measure uses a 30-day time frame because older adult patients are more vulnerable to adverse health outcomes during this time.[9] Readmission occurring within 30 days of discharge can be influenced by hospital care and the early transition to the non-acute care setting. The 30-day time frame is a clinically meaningful period for hospitals to collaborate with their communities to reduce readmissions.[10]

In determining whether an unplanned readmission occurred within 30 days of discharge from the index admission, the measure uses the claim "FROM" date, which is the date the subsequent admission episode started (that is, the date the patient first received care at that hospital within three days of the admission). Thus, in the case where (a) a patient began an unplanned readmission with an emergency department visit, observation stay, or care received in another outpatient location within the same facility (for example, outpatient diagnostic imaging), (b) the patient was admitted as an inpatient to that hospital within three days of that outpatient encounter, and (c) the care was combined into one claim, the date the outpatient care started would be used for the 30-day time frame.

Multiple Readmissions

If a patient has more than one unplanned admission within 30 days of discharge from the index admission, only the first is considered a readmission. The measure assesses a dichotomous yes or no outcome of whether each admitted patient has any unplanned readmission within 30 days. If the first readmission after discharge is planned, any subsequent unplanned readmission is not considered in the outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission.

2.2.3 Planned Readmission Algorithm (Version 4.0 2018 [ICD-10])

The planned readmission algorithm is a set of criteria for classifying readmissions as planned among the general Medicare population using Medicare administrative claims data. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital.

The planned readmission algorithm has three fundamental principles:

1. A few specific, limited types of care are always considered planned (transplant surgery, maintenance chemotherapy/immunotherapy, rehabilitation);
2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and,
3. Admissions for acute illness or for complications of care are never planned.

The algorithm was developed in 2011 as part of the HWR measure. In 2013, CMS applied the algorithm to its other readmission measures.

The planned readmission algorithm uses a flowchart and four tables of specific procedure categories, discharge diagnosis categories, and singular ICD-10 codes to classify readmissions as planned (Appendix E). As illustrated in Figure PR.1, readmissions are considered planned if any of the following occurs during the readmission:

1. A procedure is performed that is in one of the procedure categories that are always planned regardless of diagnosis (Table PR.1);
2. The principal diagnosis is in one of the diagnosis categories that are always planned (Table PR.2); or,
3. A procedure is performed that is one of the potentially planned procedures (Table PR.3) and the principal diagnosis is not in the list of acute discharge diagnoses (Table PR.4).

2.2.4 Risk-Adjustment Variables

In order to account for differences in case mix among hospitals, the measure adjusts for variables (that is, age and comorbid diseases) that are clinically relevant and have relationships with the outcome. Case mix differences among hospitals are based on the clinical status of the patient at the time of the index admission. Accordingly, only comorbidities that convey information about the patient at the time of the index admission, or any time within the preceding 12 months, are included in risk adjustment. Complications that arise during the course of the hospitalization are not used in risk adjustment.

In order to account for differences in service mix among hospitals, the measure adjusts for the principal discharge diagnosis of the index admission (grouped into AHRQ CCS diagnosis categories). Thus, for the cardiorespiratory, cardiovascular, neurology, and medicine specialty cohorts, the AHRQ CCS diagnosis categories used for risk adjustment are the same as those used to define each of these cohorts (Table D.4, Table D.5, Table D.6, and Table D.7, respectively). For the surgery/gynecology cohort, which is defined by AHRQ CCS procedure categories and ICD-10-PCS codes, the AHRQ CCS diagnosis category used for risk adjustment is simply the AHRQ CCS diagnosis category that the principal discharge diagnosis for that surgical admission falls into.

For each patient, risk-adjustment variables are obtained from inpatient Medicare administrative claims data extending 12 months prior to the index admission, and all claims data for the index admission itself.

The measure does not adjust for socioeconomic status (SES) because the association between SES and health outcomes can be due, in part, to differences in the quality of health care that groups of patients with varying SES receive. The intent is for the measure to adjust for age and clinical characteristics while illuminating important quality differences. The HWR measure was recently re-endorsed by the National Quality Forum (NQF) without adjustment for patient-level SES factors. For more information about this decision, please refer to the NQF website.

Refer to Table D.8 in Appendix D of this report for the list of comorbidity risk-adjustment variables common to all specialty cohorts and the list of potential

complications that are excluded from risk adjustment if they occur during the index admission. The Condition Categories (CCs) outlined in this table are used to identify risk variables in claims for discharges on or after October 1, 2015 as well as discharges prior to October 1, 2015.

Note that CC mappings to International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) codes (for discharges on or after October 1, 2015) and International Classification of Diseases, Clinical Modification, 9th Revision (ICD-9-CM) codes (for discharges prior to October 1, 2015) are available on the *QualityNet* website.

2.2.5 Data Sources

The data sources for these analyses are Medicare administrative claims and enrollment information for patients with hospitalizations between July 1, 2016 and June 30, 2017. To make it feasible to implement with Medicare data, the HWR risk-adjustment models use only inpatient claims data for the 12 months prior to the index admission and one month subsequent to the index admission for patients admitted in this time period. Refer to the original methodology report for further descriptions of these data sources.[1]

2.2.6 Measure Calculation

The measure estimates hospital-level 30-day all-cause RSRRs using hierarchical logistic regression models. In brief, the approach simultaneously models data at the patient and hospital levels to account for variance in patient outcomes within and between hospitals.[11] At the patient level, it models the log-odds of hospital readmission within 30 days of discharge using age, selected clinical covariates, and a hospital-specific effect. At the hospital level, the approach models the hospital-specific effects as arising from a normal distribution. The hospital effect represents the underlying risk of a readmission at the hospital, after accounting for patient risk. The hospital-specific effects are given a distribution to account for the clustering (non-independence) of patients within the same hospital.[11] If there were no differences among hospitals, then after adjusting for patient risk, the hospital effects should be identical across all hospitals.

Admissions are assigned to one of five mutually exclusive specialty cohort groups consisting of related conditions or procedures. For each specialty cohort group, the standardized readmission ratio (SRR) is calculated as the ratio of the number of "predicted" readmissions to the number of "expected" readmissions at a given hospital. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted based on the hospital's performance with its observed case mix and service mix, and the denominator is the number of readmissions expected based on the nation's performance with that hospital's case mix and service mix. This approach is analogous to a ratio of "observed" to "expected" used in other types of statistical analyses. It conceptually allows a particular hospital's performance, given its case mix and service mix, to be compared to an average hospital's performance with the same case mix and service mix. Thus, a lower ratio indicates lower-than-expected readmission rates or better quality, while a higher ratio indicates higher-than-expected readmission rates or worse quality.

For each specialty cohort, the "predicted" number of readmissions (the numerator) is calculated by using the coefficients estimated by regressing the risk factors (found in Appendix D) and the hospital-specific effect on the risk of readmission. The estimated hospital-specific effect for each cohort is added to the sum of the estimated regression coefficients multiplied by patient characteristics. The results are log transformed and summed over all patients attributed to a hospital to calculate a predicted value. The "expected" number of readmissions (the denominator) is obtained in the same manner, except that a common effect using all hospitals in our sample is added in place of the hospital-specific effect. The results are log transformed and summed over all patients attributed to a hospital to calculate an expected value. To assess hospital performance for each reporting period, we re-estimate the model coefficients using the data in that period.

The specialty cohort SRRs are then pooled for each hospital using a volume-weighted geometric mean to create a hospital-wide composite SRR. The composite SRR is multiplied by the national observed readmission rate to produce the RSRR. The statistical modeling approach is described fully in Appendix A and in the original methodology report.[1]

2.2.7 Categorizing Hospital Performance

To categorize hospital performance, CMS estimates each hospital's RSRR and the corresponding 95% interval estimate. CMS assigns hospitals to a performance category by comparing each hospital's RSRR interval estimate to the national observed readmission rate. Comparative performance for hospitals with 25 or more eligible cases is classified as follows:

- "No Different than the National Rate" if the 95% interval estimate surrounding the hospital's rate includes the national observed readmission rate.
- "Worse than the National Rate" if the entire 95% interval estimate surrounding the hospital's rate is higher than the national observed readmission rate.
- "Better than the National Rate" if the entire 95% interval estimate surrounding the hospital's rate is lower than the national observed readmission rate.

If a hospital has fewer than 25 eligible cases for a measure, CMS assigns the hospital to a separate category, "Number of Cases Too Small". This category is used when the number of cases is too small (fewer than 25) to reliably conclude how the hospital is performing. If a hospital has fewer than 25 eligible cases, the hospital's readmission rates and interval estimates will not be publicly reported for the measure.

Section 4.2.4 describes the distribution of hospitals by performance category in the U.S. for this reporting period.

3. UPDATES TO MEASURE FOR 2018 PUBLIC REPORTING

3.1. Rationale for Measure Updates

Annual measure reevaluation ensures that the risk-standardized readmission model is continually assessed and remains valid, given possible changes in clinical practice and coding standards over time. Modifications made to measure specialty cohorts, the risk model, and outcomes are informed by review of the most recent literature related to measure conditions or outcomes, feedback from various stakeholders, and empirical analyses, including assessment of coding trends that reveal shifts in clinical practice or billing patterns. As this report describes, for 2018 public reporting, we made the following modifications to the measure:

- Updated the ICD-10 code-based specifications used in the measure. Specifically:
  - Incorporated the code changes that occurred in the fiscal year (FY) 2017 version of the ICD-10-CM/PCS (effective with October 1, 2016+ discharges) into the surgery/gynecology cohort definition and planned readmission algorithm;
  - Applied the 2017.1 and 2017.2 versions of the AHRQ CCS to the specialty cohort definitions and planned readmission algorithm for diagnoses and procedures, respectively;
  - Applied the FY 2017 version of the V22 CMS-Hierarchical Condition Categories (HCC) crosswalk maintained by RTI International to the risk models; and,
  - Conducted code surveillance to identify any specification changes warranted due to coding practices and patterns. Additionally, our clinical and measure experts reviewed the pre-existing ICD-10 code-based specifications to confirm the appropriateness of the specifications unaffected by the updates.

As a part of annual reevaluation, we also undertook the following activities:

- Evaluated and validated model performance in the July 2016-June 2017 dataset; and,
- Updated the measure's SAS analytic package (SAS pack) and documentation.

3.2. Detailed Discussion of Measure Updates

3.2.1 Updates to ICD-10 Code-Based Measure Specifications

Cohort Definitions and Planned Readmission Algorithm

We studied the 2017.1 and 2017.2 versions of the AHRQ CCS for diagnoses and procedures, respectively, to determine how the newly implemented ICD-10 codes in the 2017 code set were categorized, and to examine any code shifts that may have occurred from the previous version of the AHRQ CCS to the most recent AHRQ CCS. Review of these versions of the AHRQ CCS was extensive, and included:

- Examination of approximately 2,000 ICD-10-CM codes in 73 AHRQ CCS diagnosis categories and over 1,200 ICD-10-PCS codes in 15 AHRQ CCS procedure categories to determine how the newly implemented ICD-10 codes should be incorporated into

the specialty cohort definitions and planned readmission algorithm specifications; and,
- Examination of 38 ICD-10-CM codes that shifted between AHRQ CCS diagnosis categories and over 1,300 ICD-10-PCS codes that shifted between AHRQ CCS procedure categories to investigate where code shifts may affect the specialty cohort definitions and planned readmission algorithm.

We then solicited input from clinical and measure experts to confirm the clinical appropriateness of the AHRQ CCS categorization of the newly implemented ICD-10 codes and any changes warranted due to the code shifts that occurred. The experts also reviewed the newly implemented ICD-10 codes in the FY 2017 version of the ICD-10-CM/PCS to determine which, if any, should be either added to the singular ICD-10 code lists that are also used in the algorithm (conditions that are not captured by AHRQ CCS categories) or added to any of the specialty cohort definitions (if not appropriately covered in AHRQ CCS categories). The intent was to maintain the clinical integrity of the algorithm and cohort definitions.

These processes led to the following changes:

- Changes to one of the specialty cohort definitions:
  - The addition of singular ICD-10-PCS codes to the surgery/gynecology cohort inclusion list, in addition to the AHRQ CCS-defined inclusions.
- Changes to the planned readmission algorithm:
  - Potentially planned procedures (Table PR.3): The addition of ICD-10-PCS codes that capture certain kidney/ureter release procedures, male perineum procedures, and hip/femur internal fixation device removal procedures.
  - Acute diagnoses (Table PR.4):
    - The addition of ICD-10-CM codes that capture certain intestinal atherosclerosis, artery dissection, pancreatitis, enterocolitis, and nonmalignant breast conditions, as well as lung abscess without pneumonia and select male and female genital disorders; and,
    - The removal of five AHRQ CCS diagnosis categories as whole categories (AHRQ CCS 225, 228, 230, 232, and 237); the subsets of ICD-10-CM initial encounter codes that fell under these categories were retained as acute diagnoses.

New ICD-10 codes were added to the cardiovascular, neurology, and medicine specialty cohort inclusions and the exclusions for all of the specialty cohorts. The additions included new codes in the FY 2017 version of the ICD-10-CM as well as code shifts, but the AHRQ CCS structure did not change.

Note that AHRQ publishes periodic updates to the CCS to ICD-10 code mappings. For our annual reporting, we utilize the most recent mapping available at the time of measure calculation. For 2018 public reporting, we used the 2017.1 and 2017.2 versions of the AHRQ CCS for diagnoses and procedures, respectively.

Risk Adjustment

The process of updating the risk models to account for differences in case mix among hospitals was similar to the planned readmission algorithm process described above. We studied the FY 2017 version of the V22 CMS-HCC crosswalk maintained by RTI International, to determine how the newly implemented ICD-10 codes in the 2017 code set were classified, and to examine any code shifts that may have occurred from the previous version of the HCC to the most current version. We then solicited input from clinical and measure experts to confirm the clinical appropriateness of the HCC classifications of the newly implemented ICD-10 codes and any changes warranted due to the code shifts that occurred. No changes were made as a result of these processes.

Additional Notes

The goal of these specification updates was to maintain the intent of the measure.

All changes made to the ICD-10 code-based specifications are detailed in the supplemental Excel file that accompanies this report on *QualityNet*.

Note that ICD-10 code listings in this report and the supplemental Excel file reflect the current (2017) labels or narrative descriptions for each code. Changes in the labels are not noted.

3.3. Changes to SAS Pack

We revised the measure calculation SAS pack to accommodate the ICD-10 code-based specification updates as well as the updates to the HCC and AHRQ CCS mappings. The new SAS pack and documentation are available upon request by emailing cmsreadmissionmeasures@yale.edu. **Do *NOT* submit patient-identifiable information (for example, date of birth, Social Security number, health insurance claim number) to this address.**

The SAS pack describes the data files and data elements that feed the model software. Please be aware that CMS does not provide training or technical support for the software. CMS has made the SAS pack available to be completely transparent regarding the measure calculation methodology. However, note that even with the SAS pack, it is not possible to replicate the RSRR calculation without the data files which contain longitudinal patient data from the entire national sample of acute care hospitals to estimate the individual hospital-specific effects, the average hospital-specific effect, and the risk-adjustment coefficients used in the equations.

4. RESULTS FOR 2018 PUBLIC REPORTING

4.1. Assessment of Updated Models

The HWR measure estimates hospital-specific 30-day all-cause RSRRs using hierarchical logistic regression models. Refer to Section 2 for a summary of the measure methodology and model risk-adjustment variables. Refer to prior methodology and technical reports for further details.[1-6]

We evaluated the performance of the models, using the July 1, 2016-June 30, 2017 data for the 2017 reporting period. We examined the differences in the frequencies of patient risk factors and the model variable coefficients by specialty cohort.

For each of the specialty cohorts, we assessed logistic regression model performance in terms of discriminant ability for the July 1, 2016-June 30, 2017 period. We computed two summary statistics to assess model performance: the predictive ability and the area under the receiver operating characteristic (ROC) curve (c-statistic).

The results of these analyses are presented in Section 4.2.

4.2. HWR 2018 Model Results

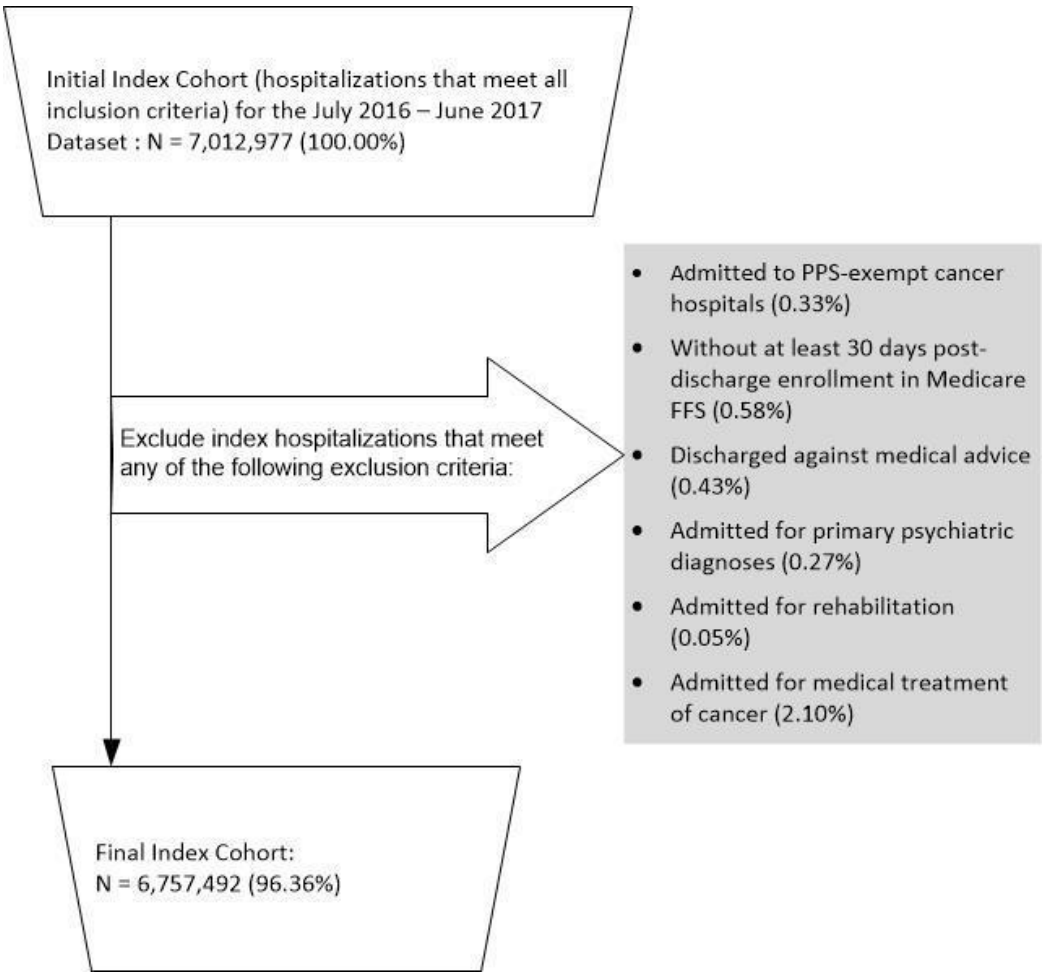
4.2.1 Index Cohort Exclusions

The exclusion criteria for this measure are presented in Section 2.2.1. The percentage of admissions that met each exclusion criterion in the July 2016-June 2017 dataset is presented in Figure 4.2.1.

Admissions may have been counted in more than one exclusion category because they are not mutually exclusive. The index cohort includes short-term acute care hospitalizations for patients:

- Aged 65 or over;
- Enrolled in Medicare FFS Part A for the 12 months prior to the date of admission and during the index admission;
- Who were not transferred to another acute care facility; and,
- Were alive at discharge.

Figure 4.2.1 – Cohort Exclusions in the July 2016-June 2017 Dataset



4.2.2 HWR Specialty Cohort Model Parameters and Performance

Table 4.2.1, Table 4.2.2, Table 4.2.3, Table 4.2.4, and Table 4.2.5 show the specialty cohort-level frequency of risk factors, risk-adjusted odds ratios (ORs) and 95% confidence intervals (CIs), and hierarchical logistic regression model variable coefficients and standard errors (SEs) for the July 1, 2016-June 30, 2017 data sample. Table 4.2.6 presents the cohort-level model performance. Table 4.2.7 presents the number of index hospitalizations and *observed* readmission rates for each specialty cohort.

4.2.3 Distribution of Hospital SRRs and RSRRs

Table 4.2.8 shows the number of hospitals with at least one admission in each specialty cohort, the mean and median national *observed* readmission rates, and the mean and median SRRs for each specialty cohort. Table 4.2.9 shows the distribution of hospital-level *observed* rates and RSRRs. The median hospital RSRR in the dataset was 15.3% (interquartile range [IQR]: 14.9% - 15.7%). Figure 4.2.2 shows the overall distribution of the hospital RSRRs for the combined dataset.

4.2.4 Distribution of Hospitals by Performance Category

Of 4,687 hospitals in the study cohort, 184 performed "Better than the National Rate," 4,060 performed "No Different than the National Rate," and 265 performed "Worse than the National Rate." 178 were classified as "Number of Cases Too Small" (fewer than 25) to reliably conclude how the hospital is performing.

Table 4.2.1 – Medicine Specialty Cohort Hierarchical Logistic Regression Model Risk Factor Frequencies, ORs, and Model Coefficients (July 2016-June 2017)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Age minus 65 (years above 65, continuous)	N/A	1.00 (1.00 - 1.00)	-0.001 (0.000)
Severe infection (CC 1, 3-6)	1.69	1.12 (1.10 - 1.14)	0.114 (0.011)
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	12.25	1.03 (1.02 - 1.04)	0.028 (0.005)
Other infectious diseases and pneumonias (CC 7, 114-116)	31.03	1.10 (1.09 - 1.11)	0.096 (0.004)
Metastatic cancer and acute leukemia (CC 8)	4.25	1.28 (1.26 - 1.30)	0.245 (0.008)
Severe cancer (CC 9-10)	6.59	1.25 (1.23 - 1.26)	0.221 (0.006)
Other cancers (CC 11-14)	9.35	1.09 (1.07 - 1.10)	0.083 (0.005)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	37.53	1.10 (1.09 - 1.11)	0.094 (0.003)
Protein-calorie malnutrition (CC 21)	14.85	1.14 (1.13 - 1.15)	0.132 (0.004)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	34.97	1.16 (1.15 - 1.17)	0.151 (0.004)
End-stage liver disease; cirrhosis of liver (CC 27-28)	3.74	1.28 (1.26 - 1.30)	0.245 (0.008)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Pancreatic disease; peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 34, 36)	11.82	1.11 (1.10 - 1.12)	0.107 (0.005)
Rheumatoid arthritis and inflammatory connective tissue disease (CC 40)	6.24	1.12 (1.10 - 1.13)	0.110 (0.006)
Severe hematological disorders (CC 46)	1.35	1.36 (1.33 - 1.39)	0.306 (0.012)
Coagulation defects and other specified hematological disorders (CC 48)	8.00	1.08 (1.07 - 1.09)	0.074 (0.005)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	50.54	1.20 (1.19 - 1.20)	0.178 (0.004)
Drug/alcohol psychosis or dependence (CC 54-55)	4.06	1.11 (1.09 - 1.13)	0.103 (0.008)
Psychiatric comorbidity (CC 57-59, 61, 63)	31.71	1.06 (1.06 - 1.07)	0.062 (0.003)
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	7.10	1.07 (1.06 - 1.08)	0.065 (0.006)
Seizure disorders and convulsions (CC 79)	5.12	1.07 (1.06 - 1.09)	0.071 (0.007)
Respirator dependence/tracheostomy status (CC 82)	0.51	1.12 (1.08 - 1.16)	0.116 (0.018)
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	16.10	1.10 (1.09 - 1.11)	0.091 (0.005)
Congestive heart failure (CC 85)	24.83	1.16 (1.15 - 1.17)	0.152 (0.004)
Coronary atherosclerosis or angina, cerebrovascular disease (CC 86-89, 102, 105-109)	51.72	1.12 (1.11 - 1.13)	0.113 (0.004)
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	26.08	1.08 (1.07 - 1.09)	0.080 (0.004)
Chronic obstructive pulmonary disease (COPD) (CC 111)	28.01	1.18 (1.17 - 1.18)	0.162 (0.004)
Fibrosis of lung or other chronic lung disorders (CC 112)	3.27	1.09 (1.08 - 1.11)	0.089 (0.008)
Transplants (CC 132, 186)	1.18	1.19 (1.16 - 1.22)	0.175 (0.013)
Dialysis status (CC 134)	3.20	1.27 (1.25 - 1.29)	0.242 (0.008)
Renal failure (CC 135-140)	43.74	1.23 (1.22 - 1.24)	0.205 (0.004)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	7.57	1.12 (1.11 - 1.13)	0.111 (0.006)
Hip fracture/dislocation (CC 170)	2.74	0.92 (0.91 - 0.94)	-0.081 (0.009)
Condition Specific Indicator (AHRQ CCS)			
Septicemia (except in labor) (CCS 2)	16.59	0.86 (0.85 - 0.87)	-0.153 (0.006)
Bacterial infection; unspecified site (CCS 3)	0.18	0.82 (0.77 - 0.89)	-0.193 (0.037)
Mycoses (CCS 4)	0.15	1.21 (1.13 - 1.29)	0.188 (0.035)
Hepatitis (CCS 6)	0.07	1.24 (1.12 - 1.37)	0.212 (0.051)
Viral infection (CCS 7)	0.28	0.82 (0.77 - 0.87)	-0.198 (0.031)
Other infections; including parasitic (CCS 8)	0.05	0.44 (0.37 - 0.53)	-0.815 (0.095)
Other and unspecified benign neoplasm (CCS 47)	0.17	0.86 (0.79 - 0.93)	-0.153 (0.041)
Thyroid disorders (CCS 48)	0.09	1.01 (0.91 - 1.11)	0.008 (0.051)
Diabetes mellitus with complications (CCS 50)	2.03	0.89 (0.87 - 0.91)	-0.115 (0.012)
Other endocrine disorders (CCS 51)	0.57	0.99 (0.95 - 1.03)	-0.011 (0.021)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Nutritional deficiencies (CCS 52)	0.09	0.96 (0.87 - 1.06)	-0.043 (0.050)
Gout and other crystal arthropathies (CCS 54)	0.19	0.72 (0.67 - 0.78)	-0.322 (0.039)
Fluid and electrolyte disorders (CCS 55)	3.35	0.92 (0.91 - 0.94)	-0.079 (0.010)
Other nutritional; endocrine; and metabolic disorders (CCS 58)	0.46	0.95 (0.91 - 0.99)	-0.055 (0.022)
Deficiency and other anemia (CCS 59)	1.45	1.00 (0.97 - 1.02)	-0.003 (0.013)
Acute posthemorrhagic anemia (CCS 60)	0.52	0.93 (0.89 - 0.97)	-0.075 (0.021)
Coagulation and hemorrhagic disorders (CCS 62)	0.36	1.05 (1.00 - 1.10)	0.050 (0.024)
Diseases of white blood cells (CCS 63)	0.32	1.09 (1.04 - 1.15)	0.088 (0.025)
Meningitis (except that caused by tuberculosis or sexually transmitted disease) (CCS 76)	0.06	0.80 (0.70 - 0.92)	-0.223 (0.072)
Encephalitis (except that caused by tuberculosis or sexually transmitted disease) (CCS 77)	0.06	1.04 (0.91 - 1.18)	0.036 (0.064)
Headache; including migraine (CCS 84)	0.15	0.63 (0.57 - 0.69)	-0.467 (0.048)
Blindness and vision defects (CCS 89)	0.04	0.65 (0.54 - 0.77)	-0.438 (0.093)
Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease) (CCS 90)	0.05	0.79 (0.67 - 0.92)	-0.240 (0.079)
Other eye disorders (CCS 91)	0.03	0.57 (0.46 - 0.70)	-0.571 (0.107)
Conditions associated with dizziness or vertigo (CCS 93)	0.46	0.44 (0.41 - 0.47)	-0.819 (0.034)
Essential hypertension (CCS 98)	0.25	0.65 (0.61 - 0.71)	-0.424 (0.039)
Hypertension with complications and secondary hypertension (CCS 99)	9.93	Reference	Reference
Phlebitis; thrombophlebitis and thromboembolism (CCS 118)	1.00	0.81 (0.79 - 0.84)	-0.205 (0.017)
Hemorrhoids (CCS 120)	0.24	0.85 (0.80 - 0.91)	-0.158 (0.032)
Other diseases of veins and lymphatics (CCS 121)	0.12	0.91 (0.83 - 0.99)	-0.098 (0.043)
Influenza (CCS 123)	1.27	0.65 (0.63 - 0.67)	-0.433 (0.017)
Other upper respiratory infections (CCS 126)	0.19	0.69 (0.63 - 0.74)	-0.375 (0.041)
Aspiration pneumonitis; food/vomitus (CCS 129)	2.04	0.90 (0.88 - 0.93)	-0.100 (0.012)
Pleurisy; pneumothorax; pulmonary collapse (CCS 130)	0.76	1.22 (1.18 - 1.26)	0.200 (0.016)
Lung disease due to external agents (CCS 132)	0.07	1.03 (0.92 - 1.14)	0.025 (0.055)
Other lower respiratory disease (CCS 133)	0.75	0.91 (0.88 - 0.94)	-0.096 (0.018)
Other upper respiratory disease (CCS 134)	0.15	0.83 (0.76 - 0.89)	-0.191 (0.040)
Intestinal infection (CCS 135)	1.87	0.99 (0.97 - 1.01)	-0.011 (0.012)
Disorders of teeth and jaw (CCS 136)	0.04	0.70 (0.59 - 0.83)	-0.358 (0.088)
Diseases of mouth; excluding dental (CCS 137)	0.10	0.65 (0.58 - 0.72)	-0.436 (0.057)
Esophageal disorders (CCS 138)	0.74	0.85 (0.82 - 0.88)	-0.166 (0.019)
Gastroduodenal ulcer (except hemorrhage) (CCS 139)	0.18	0.84 (0.78 - 0.90)	-0.176 (0.039)
Gastritis and duodenitis (CCS 140)	0.52	0.92 (0.88 - 0.96)	-0.087 (0.022)
Other disorders of stomach and duodenum (CCS 141)	0.40	1.07 (1.02 - 1.11)	0.064 (0.022)
Appendicitis and other appendiceal conditions (CCS 142)	0.06	0.88 (0.77 - 1.01)	-0.122 (0.070)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Abdominal hernia (CCS 143)	0.28	0.75 (0.71 - 0.80)	-0.281 (0.033)
Regional enteritis and ulcerative colitis (CCS 144)	0.25	1.16 (1.09 - 1.23)	0.148 (0.030)
Intestinal obstruction without hernia (CCS 145)	2.52	0.86 (0.84 - 0.88)	-0.149 (0.012)
Diverticulosis and diverticulitis (CCS 146)	2.34	0.85 (0.83 - 0.87)	-0.163 (0.012)
Anal and rectal conditions (CCS 147)	0.15	0.93 (0.86 - 1.00)	-0.077 (0.039)
Peritonitis and intestinal abscess (CCS 148)	0.10	1.10 (1.01 - 1.20)	0.097 (0.043)
Biliary tract disease (CCS 149)	0.97	1.00 (0.97 - 1.04)	0.003 (0.016)
Other liver diseases (CCS 151)	0.77	1.28 (1.24 - 1.32)	0.248 (0.017)
Pancreatic disorders (not diabetes) (CCS 152)	1.02	0.87 (0.84 - 0.90)	-0.139 (0.017)
Gastrointestinal hemorrhage (CCS 153)	3.90	0.83 (0.82 - 0.85)	-0.182 (0.009)
Noninfectious gastroenteritis (CCS 154)	0.89	0.82 (0.79 - 0.85)	-0.198 (0.018)
Other gastrointestinal disorders (CCS 155)	1.17	0.97 (0.95 - 1.00)	-0.025 (0.014)
Nephritis; nephrosis; renal sclerosis (CCS 156)	0.04	1.26 (1.10 - 1.45)	0.234 (0.069)
Acute and unspecified renal failure (CCS 157)	6.12	0.96 (0.95 - 0.97)	-0.041 (0.008)
Chronic kidney disease (CCS 158)	0.05	0.92 (0.81 - 1.04)	-0.083 (0.065)
Urinary tract infections (CCS 159)	6.61	0.87 (0.85 - 0.88)	-0.144 (0.008)
Calculus of urinary tract (CCS 160)	0.10	0.72 (0.65 - 0.81)	-0.323 (0.057)
Other diseases of kidney and ureters (CCS 161)	0.42	0.83 (0.79 - 0.88)	-0.182 (0.026)
Other diseases of bladder and urethra (CCS 162)	0.07	0.98 (0.87 - 1.10)	-0.022 (0.059)
Genitourinary symptoms and ill-defined conditions (CCS 163)	0.26	0.93 (0.87 - 0.99)	-0.073 (0.031)
Hyperplasia of prostate (CCS 164)	0.10	1.02 (0.93 - 1.13)	0.021 (0.050)
Inflammatory conditions of male genital organs (CCS 165)	0.12	0.60 (0.54 - 0.66)	-0.516 (0.054)
Skin and subcutaneous tissue infections (CCS 197)	3.32	0.77 (0.76 - 0.79)	-0.259 (0.010)
Other inflammatory condition of skin (CCS 198)	0.06	1.13 (1.00 - 1.27)	0.121 (0.061)
Chronic ulcer of skin (CCS 199)	0.21	0.81 (0.75 - 0.86)	-0.214 (0.034)
Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease (CCS 201)	0.23	0.88 (0.82 - 0.93)	-0.133 (0.032)
Rheumatoid arthritis and related disease (CCS 202)	0.05	0.82 (0.72 - 0.95)	-0.193 (0.071)
Osteoarthritis (CCS 203)	0.16	0.68 (0.63 - 0.75)	-0.380 (0.045)
Other non-traumatic joint disorders (CCS 204)	0.21	0.76 (0.70 - 0.81)	-0.281 (0.037)
Spondylosis; intervertebral disc disorders; other back problems (CCS 205)	1.19	0.77 (0.74 - 0.79)	-0.268 (0.017)
Pathological fracture (CCS 207)	0.33	0.82 (0.77 - 0.86)	-0.203 (0.029)
Systemic lupus erythematosus and connective tissue disorders (CCS 210)	0.09	1.11 (1.01 - 1.22)	0.104 (0.050)
Other connective tissue disease (CCS 211)	0.71	0.73 (0.70 - 0.77)	-0.309 (0.021)
Other bone disease and musculoskeletal deformities (CCS 212)	0.08	0.74 (0.66 - 0.83)	-0.300 (0.059)
Fracture of neck of femur (hip) (CCS 226)	0.29	0.67 (0.62 - 0.71)	-0.404 (0.034)
Skull and face fractures (CCS 228)	0.14	0.76 (0.69 - 0.84)	-0.271 (0.048)
Fracture of upper limb (CCS 229)	0.43	0.83 (0.79 - 0.87)	-0.188 (0.026)
Fracture of lower limb (CCS 230)	0.37	0.75 (0.71 - 0.79)	-0.287 (0.029)
Other fractures (CCS 231)	2.39	0.73 (0.71 - 0.75)	-0.317 (0.013)
Sprains and strains (CCS 232)	0.09	0.69 (0.62 - 0.78)	-0.369 (0.059)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Crushing injury or internal injury (CCS 234)	0.31	0.76 (0.71 - 0.81)	-0.277 (0.032)
Open wounds of head; neck; and trunk (CCS 235)	0.09	0.71 (0.63 - 0.79)	-0.345 (0.057)
Open wounds of extremities (CCS 236)	0.07	0.84 (0.74 - 0.95)	-0.174 (0.064)
Complication of device; implant or graft (CCS 237)	3.10	0.97 (0.95 - 0.99)	-0.031 (0.009)
Complications of surgical procedures or medical care (CCS 238)	2.33	0.88 (0.86 - 0.90)	-0.128 (0.011)
Superficial injury; contusion (CCS 239)	0.38	0.76 (0.72 - 0.80)	-0.277 (0.028)
Burns (CCS 240)	0.03	0.94 (0.79 - 1.11)	-0.064 (0.085)
Poisoning by psychotropic agents (CCS 241)	0.08	0.75 (0.67 - 0.84)	-0.288 (0.060)
Poisoning by other medications and drugs (CCS 242)	0.43	0.80 (0.77 - 0.84)	-0.219 (0.025)
Poisoning by nonmedicinal substances (CCS 243)	0.05	0.49 (0.41 - 0.59)	-0.712 (0.090)
Other injuries and conditions due to external causes (CCS 244)	0.57	0.75 (0.72 - 0.79)	-0.288 (0.023)
Syncope (CCS 245)	1.23	0.63 (0.61 - 0.65)	-0.468 (0.017)
Fever of unknown origin (CCS 246)	0.23	0.87 (0.81 - 0.92)	-0.145 (0.033)
Gangrene (CCS 248)	0.07	1.37 (1.24 - 1.51)	0.314 (0.051)
Shock (CCS 249)	0.07	0.83 (0.75 - 0.93)	-0.181 (0.057)
Nausea and vomiting (CCS 250)	0.21	1.11 (1.04 - 1.18)	0.106 (0.032)
Abdominal pain (CCS 251)	0.35	0.88 (0.83 - 0.93)	-0.130 (0.027)
Malaise and fatigue (CCS 252)	0.40	0.82 (0.78 - 0.86)	-0.203 (0.026)
Allergic reactions (CCS 253)	0.09	0.81 (0.73 - 0.90)	-0.210 (0.056)
Other aftercare (CCS 257)	0.04	0.77 (0.64 - 0.93)	-0.261 (0.094)
Other screening for suspected conditions (not mental disorders or infectious disease) (CCS 258)	0.09	0.85 (0.76 - 0.94)	-0.167 (0.053)
Residual codes; unclassified (CCS 259)	0.55	0.83 (0.79 - 0.87)	-0.189 (0.022)
Delirium, dementia, and amnestic and other cognitive disorders (CCS 653)	0.97	0.79 (0.76 - 0.82)	-0.240 (0.018)
Alcohol-related disorders (CCS 660)	0.58	1.03 (0.99 - 1.07)	0.027 (0.021)
Substance-related disorders (CCS 661)	0.11	0.80 (0.73 - 0.88)	-0.220 (0.049)
Adverse effects of medical drugs (CCS 2617)	0.08	0.90 (0.81 - 1.00)	-0.107 (0.053)
Low Frequency Conditions	0.46	0.83 (0.79 - 0.87)	-0.184 (0.024)

Table 4.2.2 – Surgery/Gynecology Specialty Cohort Hierarchical Logistic Regression Model Risk Factor Frequencies, ORs, and Model Coefficients (July 2016-June 2017)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Age minus 65 (years above 65, continuous)	N/A	1.01 (1.01 - 1.01)	0.014 (0.000)
Severe infection (CC 1, 3-6)	1.00	1.18 (1.14 - 1.23)	0.169 (0.020)
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	5.20	0.95 (0.93 - 0.97)	-0.054 (0.010)
Other infectious diseases and pneumonias (CC 7, 114-116)	12.80	1.10 (1.08 - 1.12)	0.096 (0.007)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Metastatic cancer and acute leukemia (CC 8)	3.25	1.30 (1.27 - 1.34)	0.266 (0.013)
Severe cancer (CC 9-10)	3.80	1.21 (1.18 - 1.23)	0.187 (0.011)
Other cancers (CC 11-14)	6.11	1.06 (1.04 - 1.08)	0.059 (0.009)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	28.76	1.17 (1.16 - 1.18)	0.157 (0.006)
Protein-calorie malnutrition (CC 21)	8.06	1.22 (1.20 - 1.23)	0.195 (0.008)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	17.23	1.10 (1.08 - 1.11)	0.092 (0.007)
End-stage liver disease; cirrhosis of liver (CC 27-28)	1.41	1.33 (1.29 - 1.38)	0.287 (0.017)
Pancreatic disease; peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 34, 36)	5.96	1.03 (1.01 - 1.05)	0.032 (0.009)
Rheumatoid arthritis and inflammatory connective tissue disease (CC 40)	5.47	1.15 (1.12 - 1.17)	0.137 (0.010)
Severe hematological disorders (CC 46)	0.53	1.37 (1.30 - 1.44)	0.316 (0.026)
Coagulation defects and other specified hematological disorders (CC 48)	3.62	1.01 (0.99 - 1.03)	0.007 (0.011)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	43.56	1.28 (1.27 - 1.29)	0.247 (0.006)
Drug/alcohol psychosis or dependence (CC 54-55)	2.44	1.12 (1.09 - 1.15)	0.112 (0.014)
Psychiatric comorbidity (CC 57-59, 61, 63)	24.18	1.11 (1.10 - 1.12)	0.104 (0.006)
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	4.41	1.08 (1.06 - 1.10)	0.077 (0.010)
Seizure disorders and convulsions (CC 79)	2.67	1.13 (1.10 - 1.16)	0.125 (0.013)
Respirator dependence/tracheostomy status (CC 82)	0.22	0.97 (0.90 - 1.05)	-0.028 (0.038)
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	6.91	1.03 (1.01 - 1.04)	0.025 (0.009)
Congestive heart failure (CC 85)	10.75	1.14 (1.12 - 1.16)	0.131 (0.008)
Coronary atherosclerosis or angina, cerebrovascular disease (CC 86-89, 102, 105-109)	37.12	1.21 (1.19 - 1.22)	0.188 (0.006)
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	13.34	1.08 (1.06 - 1.09)	0.074 (0.007)
Chronic obstructive pulmonary disease (COPD) (CC 111)	17.67	1.26 (1.24 - 1.27)	0.231 (0.006)
Fibrosis of lung or other chronic lung disorders (CC 112)	1.61	1.12 (1.09 - 1.16)	0.118 (0.016)
Transplants (CC 132, 186)	0.61	1.35 (1.29 - 1.41)	0.300 (0.024)
Dialysis status (CC 134)	1.63	1.34 (1.30 - 1.37)	0.290 (0.014)
Renal failure (CC 135-140)	23.59	1.28 (1.26 - 1.29)	0.244 (0.006)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	5.10	1.06 (1.04 - 1.09)	0.062 (0.011)
Hip fracture/dislocation (CC 170)	2.08	0.93 (0.91 - 0.96)	-0.068 (0.015)
Condition Specific Indicator (AHRQ CCS)			

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Septicemia (except in labor) (CCS 2)	3.06	0.96 (0.92 - 1.01)	-0.039 (0.026)
Cancer of head and neck (CCS 11)	0.27	0.71 (0.64 - 0.78)	-0.345 (0.051)
Cancer of esophagus (CCS 12)	0.08	1.36 (1.18 - 1.56)	0.307 (0.072)
Cancer of stomach (CCS 13)	0.17	0.90 (0.81 - 1.01)	-0.103 (0.056)
Cancer of colon (CCS 14)	1.39	0.69 (0.65 - 0.73)	-0.371 (0.031)
Cancer of rectum and anus (CCS 15)	0.36	1.15 (1.06 - 1.24)	0.136 (0.041)
Cancer of liver and intrahepatic bile duct (CCS 16)	0.09	1.13 (0.99 - 1.30)	0.124 (0.070)
Cancer of pancreas (CCS 17)	0.22	1.22 (1.11 - 1.34)	0.199 (0.047)
Cancer of other GI organs; peritoneum (CCS 18)	0.18	0.96 (0.86 - 1.07)	-0.042 (0.054)
Cancer of bronchus; lung (CCS 19)	1.05	0.70 (0.65 - 0.74)	-0.362 (0.033)
Cancer of bone and connective tissue (CCS 21)	0.09	0.90 (0.77 - 1.05)	-0.106 (0.077)
Other non-epithelial cancer of skin (CCS 23)	0.08	0.55 (0.46 - 0.66)	-0.605 (0.093)
Cancer of breast (CCS 24)	0.26	0.48 (0.42 - 0.54)	-0.736 (0.062)
Cancer of uterus (CCS 25)	0.27	0.65 (0.58 - 0.72)	-0.437 (0.055)
Cancer of ovary (CCS 27)	0.19	0.69 (0.61 - 0.77)	-0.373 (0.060)
Cancer of other female genital organs (CCS 28)	0.07	0.98 (0.83 - 1.15)	-0.023 (0.082)
Cancer of prostate (CCS 29)	0.89	0.41 (0.38 - 0.45)	-0.882 (0.044)
Cancer of bladder (CCS 32)	0.47	1.28 (1.19 - 1.37)	0.246 (0.036)
Cancer of kidney and renal pelvis (CCS 33)	0.58	0.58 (0.53 - 0.63)	-0.546 (0.042)
Cancer of other urinary organs (CCS 34)	0.08	0.75 (0.64 - 0.89)	-0.285 (0.083)
Cancer of brain and nervous system (CCS 35)	0.15	1.10 (0.98 - 1.23)	0.097 (0.058)
Non-Hodgkin`s lymphoma (CCS 38)	0.17	1.80 (1.64 - 1.98)	0.588 (0.048)
Secondary malignancies (CCS 42)	0.79	0.96 (0.90 - 1.03)	-0.040 (0.033)
Heart valve procedures (CCS 43)	0.06	1.02 (0.86 - 1.21)	0.020 (0.089)
Neoplasms of unspecified nature or uncertain behavior (CCS 44)	0.18	0.75 (0.67 - 0.85)	-0.287 (0.062)
Other and unspecified benign neoplasm (CCS 47)	1.02	0.69 (0.65 - 0.74)	-0.370 (0.034)
Diabetes mellitus with complications (CCS 50)	1.63	0.88 (0.83 - 0.93)	-0.127 (0.028)
Fluid and electrolyte disorders (CCS 55)	0.10	0.96 (0.85 - 1.09)	-0.037 (0.062)
Other nutritional; endocrine; and metabolic disorders (CCS 58)	0.35	0.47 (0.42 - 0.52)	-0.759 (0.058)
Parkinson`s disease (CCS 79)	0.08	0.41 (0.32 - 0.52)	-0.900 (0.123)
Other nervous system disorders (CCS 95)	0.49	0.83 (0.77 - 0.90)	-0.183 (0.040)
Heart valve disorders (CCS 96)	3.12	0.73 (0.69 - 0.76)	-0.321 (0.026)
Peri-; endo-; and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease) (CCS 97)	0.17	0.97 (0.87 - 1.07)	-0.033 (0.052)
Hypertension with complications and secondary hypertension (CCS 99)	0.61	Reference	Reference
Acute myocardial infarction (CCS 100)	1.15	0.89 (0.84 - 0.94)	-0.118 (0.030)
Coronary atherosclerosis and other heart disease (CCS 101)	2.18	0.74 (0.70 - 0.78)	-0.308 (0.028)
Cardiac dysrhythmias (CCS 106)	0.97	0.79 (0.74 - 0.84)	-0.240 (0.032)
Congestive heart failure; nonhypertensive (CCS 108)	0.19	1.04 (0.95 - 1.14)	0.041 (0.046)
Acute cerebrovascular disease (CCS 109)	1.07	0.93 (0.87 - 0.98)	-0.076 (0.031)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Occlusion or stenosis of precerebral arteries (CCS 110)	2.14	0.42 (0.39 - 0.44)	-0.873 (0.031)
Other and ill-defined cerebrovascular disease (CCS 111)	0.16	0.53 (0.46 - 0.62)	-0.629 (0.074)
Peripheral and visceral atherosclerosis (CCS 114)	1.10	0.93 (0.88 - 0.99)	-0.071 (0.030)
Aortic; peripheral; and visceral artery aneurysms (CCS 115)	0.38	1.01 (0.93 - 1.09)	0.006 (0.040)
Aortic and peripheral arterial embolism or thrombosis (CCS 116)	0.24	1.19 (1.09 - 1.30)	0.172 (0.045)
Other circulatory disease (CCS 117)	0.11	1.05 (0.93 - 1.18)	0.046 (0.062)
Phlebitis; thrombophlebitis and thromboembolism (CCS 118)	0.11	0.82 (0.72 - 0.94)	-0.194 (0.068)
Pneumonia (except that caused by tuberculosis or sexually transmitted disease) (CCS 122)	0.19	0.95 (0.87 - 1.05)	-0.046 (0.049)
Chronic obstructive pulmonary disease and bronchiectasis (CCS 127)	0.18	1.05 (0.96 - 1.16)	0.052 (0.050)
Aspiration pneumonitis; food/vomitus (CCS 129)	0.11	1.00 (0.89 - 1.13)	0.004 (0.059)
Pleurisy; pneumothorax; pulmonary collapse (CCS 130)	0.22	0.85 (0.77 - 0.93)	-0.165 (0.049)
Respiratory failure; insufficiency; arrest (adult) (CCS 131)	0.23	0.92 (0.84 - 1.00)	-0.088 (0.045)
Other lower respiratory disease (CCS 133)	0.17	0.74 (0.66 - 0.83)	-0.302 (0.061)
Other upper respiratory disease (CCS 134)	0.12	0.86 (0.76 - 0.97)	-0.149 (0.063)
Esophageal disorders (CCS 138)	0.20	0.75 (0.67 - 0.83)	-0.293 (0.057)
Gastroduodenal ulcer (except hemorrhage) (CCS 139)	0.16	0.98 (0.87 - 1.09)	-0.023 (0.058)
Other disorders of stomach and duodenum (CCS 141)	0.18	0.97 (0.87 - 1.07)	-0.036 (0.051)
Appendicitis and other appendiceal conditions (CCS 142)	0.54	0.62 (0.57 - 0.68)	-0.477 (0.044)
Abdominal hernia (CCS 143)	2.16	0.68 (0.64 - 0.72)	-0.392 (0.029)
Regional enteritis and ulcerative colitis (CCS 144)	0.08	1.32 (1.15 - 1.52)	0.276 (0.072)
Intestinal obstruction without hernia (CCS 145)	1.29	0.85 (0.80 - 0.90)	-0.168 (0.030)
Diverticulosis and diverticulitis (CCS 146)	0.87	0.81 (0.76 - 0.86)	-0.212 (0.034)
Anal and rectal conditions (CCS 147)	0.27	0.68 (0.61 - 0.75)	-0.390 (0.052)
Biliary tract disease (CCS 149)	2.43	0.64 (0.61 - 0.68)	-0.445 (0.028)
Other liver diseases (CCS 151)	0.09	1.28 (1.14 - 1.45)	0.251 (0.063)
Pancreatic disorders (not diabetes) (CCS 152)	0.36	0.78 (0.72 - 0.86)	-0.244 (0.045)
Gastrointestinal hemorrhage (CCS 153)	0.37	0.87 (0.81 - 0.94)	-0.138 (0.039)
Other gastrointestinal disorders (CCS 155)	0.85	0.77 (0.72 - 0.82)	-0.265 (0.033)
Acute and unspecified renal failure (CCS 157)	0.41	1.06 (0.99 - 1.14)	0.056 (0.036)
Urinary tract infections (CCS 159)	0.36	1.03 (0.95 - 1.11)	0.030 (0.039)
Calculus of urinary tract (CCS 160)	0.22	0.65 (0.58 - 0.72)	-0.435 (0.058)
Other diseases of kidney and ureters (CCS 161)	0.47	0.67 (0.62 - 0.73)	-0.393 (0.043)
Other diseases of bladder and urethra (CCS 162)	0.18	0.88 (0.79 - 0.98)	-0.125 (0.055)
Genitourinary symptoms and ill-defined conditions (CCS 163)	0.14	0.83 (0.74 - 0.93)	-0.186 (0.060)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Hyperplasia of prostate (CCS 164)	0.45	0.60 (0.55 - 0.65)	-0.514 (0.045)
Prolapse of female genital organs (CCS 170)	0.24	0.33 (0.28 - 0.39)	-1.100 (0.081)
Other female genital disorders (CCS 175)	0.11	0.77 (0.67 - 0.89)	-0.259 (0.075)
Skin and subcutaneous tissue infections (CCS 197)	0.46	0.70 (0.65 - 0.76)	-0.355 (0.040)
Chronic ulcer of skin (CCS 199)	0.32	0.76 (0.70 - 0.83)	-0.274 (0.042)
Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease (CCS 201)	0.57	0.69 (0.65 - 0.75)	-0.365 (0.037)
Rheumatoid arthritis and related disease (CCS 202)	0.07	0.38 (0.29 - 0.49)	-0.974 (0.133)
Osteoarthritis (CCS 203)	24.03	0.29 (0.28 - 0.30)	-1.238 (0.025)
Other non-traumatic joint disorders (CCS 204)	0.24	0.33 (0.29 - 0.39)	-1.095 (0.076)
Spondylosis; intervertebral disc disorders; other back problems (CCS 205)	5.13	0.52 (0.50 - 0.55)	-0.650 (0.027)
Pathological fracture (CCS 207)	0.99	0.73 (0.69 - 0.78)	-0.311 (0.032)
Other acquired deformities (CCS 209)	1.26	0.51 (0.47 - 0.54)	-0.680 (0.036)
Other connective tissue disease (CCS 211)	0.57	0.42 (0.39 - 0.46)	-0.860 (0.047)
Other bone disease and musculoskeletal deformities (CCS 212)	0.24	0.47 (0.42 - 0.54)	-0.749 (0.063)
Cardiac and circulatory congenital anomalies (CCS 213)	0.11	0.72 (0.63 - 0.84)	-0.323 (0.074)
Joint disorders and dislocations; trauma-related (CCS 225)	0.15	0.64 (0.56 - 0.74)	-0.444 (0.069)
Fracture of neck of femur (hip) (CCS 226)	8.79	0.63 (0.60 - 0.66)	-0.468 (0.025)
Skull and face fractures (CCS 228)	0.08	0.56 (0.46 - 0.67)	-0.586 (0.095)
Fracture of upper limb (CCS 229)	1.19	0.50 (0.47 - 0.54)	-0.689 (0.034)
Fracture of lower limb (CCS 230)	2.07	0.65 (0.62 - 0.69)	-0.426 (0.029)
Other fractures (CCS 231)	0.94	0.82 (0.77 - 0.87)	-0.204 (0.032)
Sprains and strains (CCS 232)	0.11	0.44 (0.36 - 0.53)	-0.825 (0.097)
Intracranial injury (CCS 233)	0.53	0.98 (0.91 - 1.05)	-0.023 (0.037)
Crushing injury or internal injury (CCS 234)	0.11	0.95 (0.83 - 1.08)	-0.057 (0.068)
Open wounds of head; neck; and trunk (CCS 235)	0.06	0.54 (0.44 - 0.67)	-0.613 (0.107)
Open wounds of extremities (CCS 236)	0.12	0.78 (0.68 - 0.89)	-0.252 (0.068)
Complication of device; implant or graft (CCS 237)	4.63	0.77 (0.73 - 0.81)	-0.259 (0.025)
Complications of surgical procedures or medical care (CCS 238)	2.43	0.83 (0.79 - 0.88)	-0.184 (0.027)
Burns (CCS 240)	0.06	0.88 (0.74 - 1.05)	-0.127 (0.090)
Other injuries and conditions due to external causes (CCS 244)	0.07	0.84 (0.71 - 0.99)	-0.173 (0.084)
Gangrene (CCS 248)	0.38	1.17 (1.08 - 1.25)	0.153 (0.037)
Other aftercare (CCS 257)	0.15	0.54 (0.47 - 0.61)	-0.623 (0.069)
Low Frequency Conditions	1.96	0.85 (0.81 - 0.90)	-0.158 (0.028)

Table 4.2.3 - Cardiorespiratory Specialty Cohort Hierarchical Logistic Regression Model Risk Factor Frequencies, ORs, and Model Coefficients (July 2016-June 2017)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Age minus 65 (years above 65, continuous)	N/A	1.00 (1.00 - 1.00)	-0.002 (0.000)
Severe infection (CC 1, 3-6)	1.67	1.10 (1.06 - 1.15)	0.098 (0.020)
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	10.25	1.01 (1.00 - 1.03)	0.015 (0.009)
Other infectious diseases and pneumonias (CC 7, 114-116)	40.74	1.06 (1.05 - 1.07)	0.059 (0.007)
Metastatic cancer and acute leukemia (CC 8)	3.21	1.26 (1.22 - 1.30)	0.232 (0.016)
Severe cancer (CC 9-10)	6.88	1.24 (1.21 - 1.27)	0.213 (0.011)
Other cancers (CC 11-14)	5.83	1.06 (1.04 - 1.08)	0.058 (0.012)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	35.87	1.09 (1.08 - 1.11)	0.090 (0.006)
Protein-calorie malnutrition (CC 21)	12.05	1.11 (1.10 - 1.13)	0.107 (0.008)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	33.01	1.14 (1.12 - 1.16)	0.131 (0.007)
End-stage liver disease; cirrhosis of liver (CC 27-28)	1.78	1.16 (1.11 - 1.20)	0.145 (0.019)
Pancreatic disease; peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 34, 36)	8.00	1.09 (1.07 - 1.11)	0.083 (0.010)
Rheumatoid arthritis and inflammatory connective tissue disease (CC 40)	6.09	1.06 (1.04 - 1.08)	0.058 (0.011)
Severe hematological disorders (CC 46)	1.05	1.24 (1.19 - 1.31)	0.219 (0.025)
Coagulation defects and other specified hematological disorders (CC 48)	6.68	1.05 (1.03 - 1.07)	0.046 (0.010)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	44.24	1.20 (1.18 - 1.21)	0.180 (0.006)
Drug/alcohol psychosis or dependence (CC 54-55)	3.68	1.20 (1.17 - 1.24)	0.185 (0.014)
Psychiatric comorbidity (CC 57-59, 61, 63)	34.71	1.10 (1.09 - 1.12)	0.100 (0.006)
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	4.73	1.08 (1.06 - 1.11)	0.078 (0.012)
Seizure disorders and convulsions (CC 79)	3.90	1.06 (1.03 - 1.09)	0.060 (0.014)
Respirator dependence/tracheostomy status (CC 82)	0.63	1.09 (1.03 - 1.16)	0.090 (0.030)
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	29.43	1.22 (1.20 - 1.23)	0.195 (0.007)
Congestive heart failure (CC 85)	32.65	1.20 (1.18 - 1.22)	0.184 (0.008)
Coronary atherosclerosis or angina, cerebrovascular disease (CC 86-89, 102, 105-109)	54.25	1.12 (1.11 - 1.14)	0.116 (0.006)
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	28.88	1.11 (1.09 - 1.12)	0.103 (0.007)
Chronic obstructive pulmonary disease (COPD) (CC 111)	53.18	1.20 (1.19 - 1.22)	0.185 (0.007)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Fibrosis of lung or other chronic lung disorders (CC 112)	7.57	1.09 (1.07 - 1.11)	0.087 (0.010)
Transplants (CC 132, 186)	0.67	1.16 (1.09 - 1.23)	0.149 (0.030)
Dialysis status (CC 134)	2.21	1.24 (1.20 - 1.28)	0.212 (0.017)
Renal failure (CC 135-140)	38.60	1.18 (1.17 - 1.20)	0.169 (0.006)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	4.80	1.10 (1.08 - 1.13)	0.098 (0.012)
Hip fracture/dislocation (CC 170)	2.25	0.90 (0.87 - 0.94)	-0.101 (0.018)
Condition Specific Indicator (AHRQ CCS)			
Pulmonary heart disease (CCS 103)	6.08	0.81 (0.78 - 0.83)	-0.215 (0.015)
Congestive heart failure; nonhypertensive (CCS 108)	19.88	1.06 (1.04 - 1.08)	0.056 (0.010)
Pneumonia (except that caused by tuberculosis or sexually transmitted disease) (CCS 122)	25.55	0.88 (0.86 - 0.89)	-0.131 (0.010)
Acute bronchitis (CCS 125)	2.06	0.74 (0.71 - 0.78)	-0.297 (0.025)
Chronic obstructive pulmonary disease and bronchiectasis (CCS 127)	29.94	1.00 (0.98 - 1.02)	0.001 (0.009)
Asthma (CCS 128)	1.45	0.77 (0.73 - 0.82)	-0.257 (0.028)
Respiratory failure; insufficiency; arrest (adult) (CCS 131)	15.03	Reference	Reference
Low Frequency Conditions	0.01	0.94 (0.44 - 2.02)	-0.063 (0.392)

Table 4.2.4 - Cardiovascular Specialty Cohort Hierarchical Logistic Regression Model Risk Factor Frequencies, ORs, and Model Coefficients (July 2016-June 2017)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Age minus 65 (years above 65, continuous)	N/A	1.01 (1.01 - 1.02)	0.015 (0.000)
Severe infection (CC 1, 3-6)	0.78	1.16 (1.08 - 1.24)	0.148 (0.035)
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	5.09	0.98 (0.95 - 1.01)	-0.022 (0.015)
Other infectious diseases and pneumonias (CC 7, 114-116)	16.87	1.15 (1.13 - 1.17)	0.140 (0.010)
Metastatic cancer and acute leukemia (CC 8)	1.80	1.36 (1.30 - 1.43)	0.310 (0.025)
Severe cancer (CC 9-10)	3.65	1.30 (1.26 - 1.35)	0.262 (0.018)
Other cancers (CC 11-14)	5.02	1.05 (1.02 - 1.08)	0.049 (0.016)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	34.18	1.14 (1.12 - 1.16)	0.132 (0.008)
Protein-calorie malnutrition (CC 21)	6.29	1.15 (1.12 - 1.19)	0.144 (0.013)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	21.80	1.14 (1.12 - 1.16)	0.131 (0.010)
End-stage liver disease; cirrhosis of liver (CC 27-28)	1.40	1.27 (1.21 - 1.34)	0.240 (0.026)
Pancreatic disease; peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 34, 36)	6.14	1.08 (1.06 - 1.11)	0.081 (0.014)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Rheumatoid arthritis and inflammatory connective tissue disease (CC 40)	5.05	1.13 (1.10 - 1.17)	0.123 (0.015)
Severe hematological disorders (CC 46)	0.71	1.27 (1.19 - 1.37)	0.242 (0.036)
Coagulation defects and other specified hematological disorders (CC 48)	4.77	1.02 (0.99 - 1.05)	0.021 (0.015)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	33.93	1.31 (1.29 - 1.33)	0.272 (0.009)
Drug/alcohol psychosis or dependence (CC 54-55)	2.49	1.26 (1.21 - 1.31)	0.228 (0.021)
Psychiatric comorbidity (CC 57-59, 61, 63)	24.82	1.13 (1.11 - 1.15)	0.124 (0.008)
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	3.88	1.14 (1.11 - 1.18)	0.134 (0.017)
Seizure disorders and convulsions (CC 79)	3.02	1.13 (1.09 - 1.18)	0.125 (0.019)
Respirator dependence/tracheostomy status (CC 82)	0.17	1.02 (0.89 - 1.17)	0.021 (0.069)
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	10.76	1.07 (1.05 - 1.10)	0.069 (0.012)
Congestive heart failure (CC 85)	21.66	1.24 (1.21 - 1.27)	0.214 (0.011)
Coronary atherosclerosis or angina, cerebrovascular disease (CC 86-89, 102, 105-109)	63.15	1.10 (1.08 - 1.12)	0.093 (0.009)
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	26.86	1.06 (1.04 - 1.08)	0.059 (0.010)
Chronic obstructive pulmonary disease (COPD) (CC 111)	25.23	1.32 (1.30 - 1.35)	0.280 (0.008)
Fibrosis of lung or other chronic lung disorders (CC 112)	2.62	1.14 (1.10 - 1.19)	0.133 (0.020)
Transplants (CC 132, 186)	0.62	1.11 (1.03 - 1.20)	0.107 (0.040)
Dialysis status (CC 134)	2.46	1.45 (1.39 - 1.50)	0.370 (0.019)
Renal failure (CC 135-140)	34.45	1.31 (1.29 - 1.33)	0.272 (0.008)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	3.19	1.20 (1.16 - 1.24)	0.179 (0.018)
Hip fracture/dislocation (CC 170)	1.43	0.89 (0.84 - 0.94)	-0.116 (0.027)
Condition Specific Indicator (AHRQ CCS)			
Heart valve disorders (CCS 96)	1.43	0.72 (0.67 - 0.78)	-0.326 (0.040)
Peri-; endo-; and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease) (CCS 97)	1.53	Reference	Reference
Acute myocardial infarction (CCS 100)	25.04	0.84 (0.80 - 0.89)	-0.170 (0.028)
Coronary atherosclerosis and other heart disease (CCS 101)	10.64	0.64 (0.60 - 0.68)	-0.446 (0.029)
Nonspecific chest pain (CCS 102)	6.37	0.59 (0.56 - 0.63)	-0.523 (0.031)
Other and ill-defined heart disease (CCS 104)	0.49	0.73 (0.65 - 0.83)	-0.313 (0.062)
Conduction disorders (CCS 105)	4.10	0.54 (0.51 - 0.58)	-0.608 (0.034)
Cardiac dysrhythmias (CCS 106)	37.05	0.83 (0.78 - 0.87)	-0.190 (0.027)
Cardiac arrest and ventricular fibrillation (CCS 107)	0.41	0.72 (0.64 - 0.81)	-0.334 (0.061)
Peripheral and visceral atherosclerosis (CCS 114)	3.32	0.76 (0.71 - 0.81)	-0.278 (0.033)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Aortic; peripheral; and visceral artery aneurysms (CCS 115)	3.59	0.70 (0.65 - 0.75)	-0.358 (0.034)
Aortic and peripheral arterial embolism or thrombosis (CCS 116)	0.47	0.83 (0.74 - 0.93)	-0.184 (0.058)
Other circulatory disease (CCS 117)	5.22	0.73 (0.69 - 0.78)	-0.312 (0.031)
Cardiac and circulatory congenital anomalies (CCS 213)	0.34	0.87 (0.77 - 0.98)	-0.143 (0.060)

Table 4.2.5 - Neurology Specialty Cohort Hierarchical Logistic Regression Model Risk Factor Frequencies, ORs, and Model Coefficients (July 2016-June 2017)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Age minus 65 (years above 65, continuous)	N/A	1.00 (1.00 - 1.00)	0.000 (0.001)
Severe infection (CC 1, 3-6)	1.20	1.11 (1.04 - 1.20)	0.109 (0.037)
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	5.87	1.00 (0.97 - 1.04)	0.003 (0.019)
Other infectious diseases and pneumonias (CC 7, 114-116)	16.58	1.13 (1.10 - 1.16)	0.118 (0.014)
Metastatic cancer and acute leukemia (CC 8)	3.30	1.34 (1.27 - 1.41)	0.292 (0.026)
Severe cancer (CC 9-10)	4.41	1.26 (1.20 - 1.31)	0.228 (0.022)
Other cancers (CC 11-14)	6.33	1.09 (1.05 - 1.13)	0.083 (0.019)
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	34.51	1.17 (1.15 - 1.19)	0.156 (0.010)
Protein-calorie malnutrition (CC 21)	9.03	1.11 (1.08 - 1.14)	0.103 (0.015)
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	23.88	1.11 (1.09 - 1.14)	0.108 (0.013)
End-stage liver disease; cirrhosis of liver (CC 27-28)	1.44	1.37 (1.29 - 1.46)	0.317 (0.033)
Pancreatic disease; peptic ulcer, hemorrhage, other specified gastrointestinal disorders (CC 34, 36)	5.77	1.04 (1.00 - 1.08)	0.038 (0.018)
Rheumatoid arthritis and inflammatory connective tissue disease (CC 40)	4.68	1.10 (1.06 - 1.15)	0.098 (0.021)
Severe hematological disorders (CC 46)	0.64	1.31 (1.19 - 1.44)	0.271 (0.049)
Coagulation defects and other specified hematological disorders (CC 48)	4.73	1.06 (1.02 - 1.10)	0.054 (0.020)
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	31.12	1.22 (1.19 - 1.24)	0.195 (0.011)
Drug/alcohol psychosis or dependence (CC 54-55)	3.87	1.07 (1.02 - 1.12)	0.064 (0.023)
Psychiatric comorbidity (CC 57-59, 61, 63)	29.45	1.01 (0.99 - 1.03)	0.013 (0.011)
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	9.14	1.08 (1.05 - 1.11)	0.077 (0.016)
Seizure disorders and convulsions (CC 79)	10.73	1.14 (1.10 - 1.17)	0.127 (0.015)

Risk Variable	% of Hospitalizations with This Risk Variable	OR (95% CI)	Model Coefficients (SE)
Respirator dependence/tracheostomy status (CC 82)	0.21	0.95 (0.81 - 1.12)	-0.048 (0.084)
Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	8.76	1.08 (1.05 - 1.12)	0.079 (0.017)
Congestive heart failure (CC 85)	14.47	1.12 (1.09 - 1.15)	0.113 (0.015)
Coronary atherosclerosis or angina, cerebrovascular disease (CC 86-89, 102, 105-109)	55.72	1.14 (1.12 - 1.16)	0.130 (0.011)
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	19.08	1.10 (1.07 - 1.12)	0.091 (0.013)
Chronic obstructive pulmonary disease (COPD) (CC 111)	17.98	1.17 (1.14 - 1.20)	0.159 (0.012)
Fibrosis of lung or other chronic lung disorders (CC 112)	1.64	1.07 (1.00 - 1.14)	0.066 (0.033)
Transplants (CC 132, 186)	0.55	1.18 (1.07 - 1.31)	0.168 (0.052)
Dialysis status (CC 134)	1.99	1.43 (1.35 - 1.50)	0.356 (0.027)
Renal failure (CC 135-140)	28.90	1.24 (1.21 - 1.27)	0.214 (0.011)
Decubitus ulcer or chronic skin ulcer (CC 157-161)	3.22	1.15 (1.10 - 1.21)	0.144 (0.023)
Hip fracture/dislocation (CC 170)	2.14	0.82 (0.77 - 0.87)	-0.197 (0.031)
Condition Specific Indicator (AHRQ CCS)			
Parkinson`s disease (CCS 79)	1.55	0.87 (0.80 - 0.94)	-0.138 (0.041)
Multiple sclerosis (CCS 80)	0.32	1.15 (0.98 - 1.34)	0.137 (0.081)
Other hereditary and degenerative nervous system conditions (CCS 81)	1.18	0.88 (0.80 - 0.95)	-0.133 (0.044)
Paralysis (CCS 82)	0.29	0.85 (0.72 - 1.00)	-0.166 (0.086)
Epilepsy; convulsions (CCS 83)	8.38	0.84 (0.81 - 0.87)	-0.176 (0.020)
Other nervous system disorders (CCS 95)	16.64	Reference	Reference
Acute cerebrovascular disease (CCS 109)	47.06	0.84 (0.81 - 0.86)	-0.180 (0.013)
Occlusion or stenosis of precerebral arteries (CCS 110)	0.82	0.75 (0.67 - 0.84)	-0.288 (0.056)
Other and ill-defined cerebrovascular disease (CCS 111)	0.49	0.80 (0.70 - 0.92)	-0.221 (0.069)
Transient cerebral ischemia (CCS 112)	10.53	0.66 (0.64 - 0.69)	-0.411 (0.020)
Late effects of cerebrovascular disease (CCS 113)	1.34	0.77 (0.71 - 0.84)	-0.262 (0.042)
Intracranial injury (CCS 233)	10.88	1.10 (1.06 - 1.14)	0.097 (0.017)
Low Frequency Conditions	0.52	1.12 (0.99 - 1.25)	0.110 (0.059)

Table 4.2.6 – Model Performance by Specialty Cohort (July 2016-June 2017)

Specialty Cohort	Predictive Ability, % (lowest decile-highest decile)	c-statistic
Medicine	7.7 - 32.8	0.65
Surgery/Gynecology	2.4 - 26.7	0.71
Cardiorespiratory	8.4 - 34.6	0.64

Specialty Cohort	Predictive Ability, % (lowest decile-highest decile)	c-statistic
Cardiovascular	5.2 - 29.5	0.67
Neurology	6.4 - 25.4	0.63

Table 4.2.7 - Index Hospitalizations and Observed Readmission Rates by Specialty Cohort (July 2016-June 2017)

Specialty Cohort	Index Hospitalizations	Observed Readmission Rate
Medicine	3,064,545	17.3%
Surgery/Gynecology	1,756,819	11.1%
Cardiorespiratory	879,670	18.7%
Cardiovascular	644,861	14.3%
Neurology	411,597	13.0%
HWR	6,757,492	15.3%

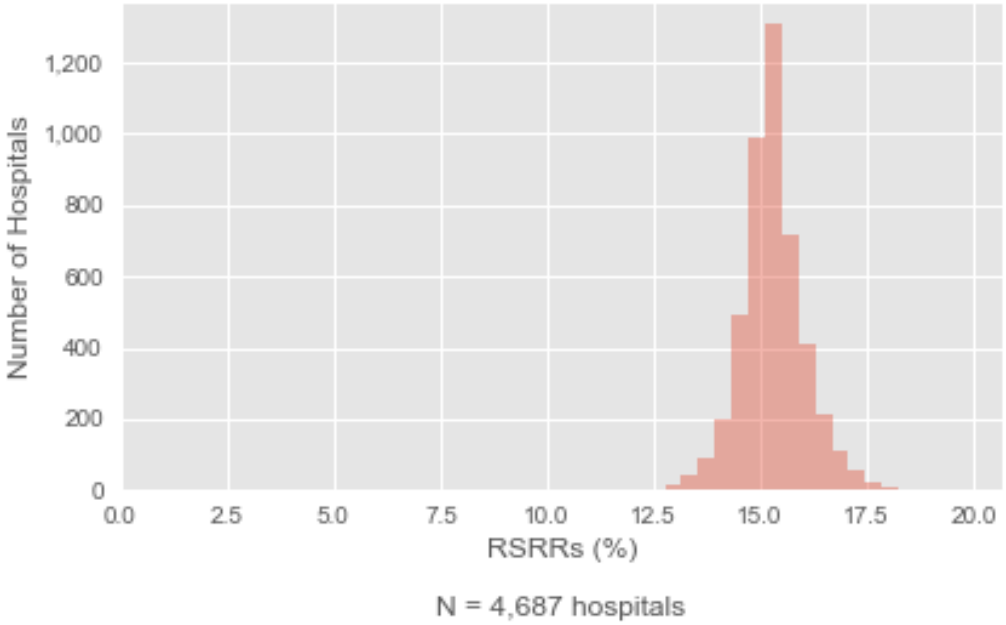
Table 4.2.8 - Hospital-Level Observed Readmission Rates and SRRs (July 2016-June 2017)

Variable	Number of Hospitals	Mean Observed Readmission Rate (standard deviation [SD])	Median Observed Readmission Rate (IQR)	Mean SRR (SD)	Median SRR (IQR)
Medicine	4,644	15.3 (5.6)	15.9 (12.9 - 18.3)	1.001 (0.065)	0.997 (0.963 - 1.035)
Surgery/ Gynecology	3,932	10.6 (8.8)	10.2 (6.7 - 13.3)	1.001 (0.060)	0.998 (0.971 - 1.028)
Cardiorespiratory	4,508	17.2 (7.2)	17.5 (13.9 - 20.8)	1.001 (0.058)	0.996 (0.966 - 1.031)
Cardiovascular	4,307	14.4 (11.7)	13.8 (9.7 - 17.6)	1.001 (0.044)	0.998 (0.983 - 1.018)
Neurology	4,284	11.9 (12.0)	11.5 (4.7 - 15.3)	1.001 (0.041)	0.997 (0.983 - 1.015)
HWR	4,687	14.2 (4.8)	14.6 (12.0 - 16.8)	1.000 (0.050)	0.997 (0.972 - 1.026)

Table 4.2.9 - Distribution of Hospital-Level Observed Readmission Rates and RSRRs (July 2016-June 2017)

Composite Readmission Rate	Mean	SD	Min	10th Percentile	Lower Quartile	Median	Upper Quartile	90th Percentile	Max
Observed	14.2	4.8	0.0	8.7	12.0	14.6	16.8	19.1	100.0
RSRR	15.3	0.8	10.6	14.4	14.9	15.3	15.7	16.3	20.3

Figure 4.2.2 – Distribution of Hospital 30-Day HWR RSRRs between July 2016 and June 2017



5. GLOSSARY

Acute care hospital: A hospital that provides inpatient medical care for surgery and acute medical conditions or injuries. Short-term acute care hospitals provide care for short-term illnesses and conditions.

Bootstrapping: The bootstrap is a computer-based method for estimating the standard error of an estimate when the estimate is based on a sample with an unknown probability distribution. Bootstrap methods depend on the bootstrap sample, which is a random sample of size *n* drawn with replacement from the population of *n* objects. The bootstrap algorithm works by drawing many independent bootstrap samples, evaluating the corresponding bootstrap replications, and estimating the standard error of the statistic by the empirical standard deviation of the replications.

C-statistic: An indicator of the model's discriminant ability or ability to correctly classify those who have and have not been readmitted within 30 days of discharge. Potential values range from 0.5, meaning no better than chance, to 1.0, an indication of perfect prediction. Perfect prediction implies that patients' outcomes can be predicted completely by their risk factors, and physicians and hospitals play no role in their patients' outcomes.

Case mix: The particular illness severity, age, and, for some measures, gender characteristics of patients with index admissions at a given hospital.

Clinical Classification Software (CCS): Software maintained by the AHRQ that groups thousands of individual procedure and diagnosis codes into clinically coherent, mutually exclusive procedure and diagnosis categories. AHRQ CCS procedure and diagnosis categories are used to define specialty cohorts and risk adjust. Additionally, AHRQ CCS categories are used to determine if a readmission is planned. AHRQ CCS procedure categories are used to define planned and potentially planned procedures. AHRQ CCS diagnosis categories are used to define acute diagnoses and complications of care that are considered unplanned, as well as a few specific types of care that are always considered planned (for example, maintenance chemotherapy). Mappings which show the assignment of ICD-10 codes to the AHRQ CCS diagnosis and procedure categories are available on the AHRQ website.

Cohort: The index admissions used to calculate the measure after inclusion and exclusion criteria have been applied.

Comorbidities: Medical conditions that the patient had in addition to his/her primary reason for admission to the hospital.

Complications: Medical conditions that may have occurred as a consequence of care rendered during hospitalization.

Condition Categories (CCs): Groupings of ICD-9-CM/ICD-10-CM diagnosis codes in clinically relevant categories, from the HCCs system.[12,13] CMS uses the grouping but not the hierarchical logic of the system to create risk factor variables. Mappings which show the assignment of ICD-9 and ICD-10 codes to the CCs are available on the *QualityNet* website.

Confidence interval (CI): A CI is a range of values that describes the uncertainty surrounding an estimate. It is indicated by its endpoints; for example, a 95% CI for the OR associated with protein-

calorie malnutrition noted as "1.09 – 1.15" would indicate that there is 95% confidence that the OR lies between 1.09 and 1.15.

Expected readmissions: The number of readmissions expected based on average hospital performance with a given hospital's case mix and service mix.

Hierarchical model: A widely accepted statistical method that enables evaluation of relative hospital performance by accounting for patient risk factors. This statistical model accounts for the hierarchical structure of the data (patients clustered within hospitals are assumed to be correlated) and accommodates modeling of the association between outcomes and patient characteristics. Based on the hierarchical model, we can evaluate (1) how much variation in hospital readmission rates overall is accounted for by patients' individual risk factors (such as age and other medical conditions), and (2) how much variation is accounted for by hospital contribution to readmission risk.

Hospital-specific effect: A measure of the hospital quality of care that is calculated through hierarchical logistic regression, taking into consideration how many patients were eligible for the cohort, these patients' risk factors, and how many were readmitted. The hospital-specific effect is the calculated random effect for each hospital. The hospital-specific effect will be negative for a better-than-average hospital, positive for a worse-than-average hospital, and close to zero for an average hospital. The hospital-specific effect is used in the numerator to calculate "predicted" readmissions.

Index admission: Any admission included in the measure calculation as the initial admission for an episode of care and evaluated for the outcome.

Interval estimate: Similar to a CI. The interval estimate is a range of probable values for the estimate that characterizes the amount of associated uncertainty. For example, a 95% interval estimate for a readmission rate indicates there is 95% confidence that the true value of the rate lies between the lower and the upper limit of the interval.

Low Frequency Conditions: Compilation of all AHRQ CCS categories with fewer than 1,000 admits/year. Included AHRQ CCS categories could change from year to year.

Medicare Fee-For-Service (FFS): Original Medicare plan in which providers receive a fee or payment for each individual service provided directly from Medicare. Only beneficiaries in Medicare FFS, not in managed care (Medicare Advantage), are included in the measure.

National observed readmission rate: All included hospitalizations with the outcome divided by all included hospitalizations.

Odds ratio (OR): The ORs express the relative odds of the outcome for each of the predictor variables. For example, the OR for Protein-calorie malnutrition (CC 21) represents the odds of the outcome for patients with that risk variable present relative to those without the risk variable present. The model coefficient for each risk variable is the log (odds) for that variable.

Outcome: The result of a broad set of healthcare activities that affect patients' well-being. For this readmission measure, the outcome is readmission within 30 days of discharge.

Planned readmissions: A readmission within 30 days of discharge from a short-term acute care hospital that is a scheduled part of the patient's plan of care. Planned readmissions are not captured in the outcome of this measure.

Predicted readmissions: The number of readmissions within 30 days predicted based on the hospital's performance with its observed case mix and service mix.

Predictive ability: An indicator of the model's discriminant ability or ability to distinguish high-risk subjects from low-risk subjects. A wide range between the lowest decile and highest decile suggests better discrimination.

Risk-adjustment variables: Patient demographics and comorbidities used to standardize rates for differences in case mix and service mix across hospitals.

Service mix: The particular conditions and procedures of the patients with index admissions at a given hospital.

Specialty cohort: A group of index admissions for patients with related AHRQ CCS diagnosis or procedure categories (or related ICD-10-PCS codes, in the case of the surgery/gynecology cohort) that are likely treated by similar care teams. This measure includes five cohorts, each with its own risk model.

Unplanned readmissions: Acute clinical events a patient experiences that require urgent rehospitalization. Unplanned readmissions are the outcomes of the measure.

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7. APPENDICES

Appendix A. Statistical Approach for Medicare HWR

The Medicare HWR measure uses hierarchical generalized linear models (HGLMs) to estimate RSRRs for hospitals. This modeling approach accounts for the within-hospital correlation of the observed outcome, and accommodates the assumption that underlying differences in quality across hospitals lead to systematic differences in outcomes.

For each of the five specialty cohorts in the Medicare HWR measure, a separate HGLM model is estimated. Then for each hospital, an SRR is calculated for each of the specialty cohorts with at least one index admission. Finally, a composite SRR for each hospital is created by calculating a volume weighted geometric mean of the specialty cohort SRRs for that hospital. The RSRR is calculated by multiplying the composite SRR for each hospital by the national observed readmission rate.

Hierarchical Generalized Linear Model

For each specialty cohort, we fit an HGLM, which accounts for clustering of observations within hospitals. We assume the outcome has a known exponential family distribution and relates linearly to the covariates via a known link function, *h*. Specifically, we assume a binomial distribution and a logit link function. Further, we account for the clustering within hospitals by estimating a hospital-specific effect, α_i, which we assume follows a normal distribution with a mean μ and variance τ^2, the between-hospital variance component. The following equation defines the HGLM:

$$h\left(\Pr\left(Y_{ij}=1\middle|\boldsymbol{Z}_{ij},\omega_i\right)\right)=log\left(\frac{\Pr(Y_{ij}=1|\boldsymbol{Z}_{ij},\omega_i)}{1-\Pr(Y_{ij}=1|\boldsymbol{Z}_{ij},\omega_i)}\right)=\alpha_i+\boldsymbol{\beta}\boldsymbol{Z}_{ij} \qquad (1)$$

$$\text{where } \alpha_i=\mu+\omega_i;\ \omega_i{\sim}N(0,\tau^2)$$

$$\text{i=1,…, I; j=1,…,}n_i$$

where Y_{ij} denotes the outcome (equal to 1 if the patient is readmitted within 30 days, 0 otherwise) for the *j-th* patient in the specialty cohort at the *i-th* hospital; $\boldsymbol{Z}_{ij}=\left(Z_{ij1},Z_{ij2},\ldots,Z_{ijp}\right)^T$ is a set of *p* patient-specific covariates derived from the data; and *I* denotes the total number of hospitals and n_i denotes the number of index admissions at hospital *i* in each specialty cohort. The hospital-specific intercept of the *i-th* hospital, α_i, defined above, comprises μ, the adjusted average intercept over all hospitals in the sample, and ω_i, the hospital-specific intercept deviation from μ.[14]

We estimate the HGLMs using the SAS software system (GLIMMIX procedure).

Standardized Risk Ratio for Each Specialty Cohort

For each specialty cohort, we use the HGLM defined by Equation (1), to obtain the parameter estimates $\hat{\mu}$, $\{\hat{\alpha}_1,\hat{\alpha}_2,\ldots,\hat{\alpha}_I\}$, $\widehat{\boldsymbol{\beta}}$, and $\hat{\tau}^2$. We calculate an SRR, $\hat{s}_i$, for each hospital by computing the number of the predicted readmissions to the number of expected readmissions. Specifically, we calculate:

Predicted Value: $\hat{p}_{ij} = h^{-1}\left(\hat{\alpha}_i + \widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij}\right) = \frac{\exp(\hat{\alpha}_i + \widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij})}{\exp(\hat{\alpha}_i + \widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij})+1}$ (2)

Expected Value: $\hat{e}_{ij} = h^{-1}\left(\hat{\mu} + \widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij}\right) = \frac{\exp(\hat{\mu} + \widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij})}{\exp(\hat{\mu} + \widehat{\boldsymbol{\beta}}\boldsymbol{Z}_{ij})+1}$ (3)

Standardized Risk Ratio: $\hat{s}_i = \frac{\sum_{j=1}^{n_i} \hat{p}_{ij}}{\sum_{j=1}^{n_i} \hat{e}_{ij}}$ (4)

Composite Standardized Risk Ratio and Risk Standardized Readmission Rate

For each hospital, we obtain the parameter estimate $\hat{s}_i$ from Equation (4). To report a single readmission score, the specialty cohort SRRs are combined into a composite SRR, $\hat{t}_i$. The composite SRR is the volume-weighted geometric mean of the specialty cohort SRRs where *k=1,…,5* indicates the *k*-th specialty cohort:

Composite Standardized Risk Ratio: $\hat{t}_i = \left(\prod_{k=1}^{5} \hat{s}_{ik}^{n_{ik}}\right)^{\frac{1}{\sum_{k=1}^{5} n_{ik}}} = exp\left(\frac{\sum_{k=1}^{5} n_{ik} \log \hat{s}_{ik}}{\sum_{k=1}^{5} n_{ik}}\right)$ (5)

We calculate an RSRR, $\widehat{RSRR}_i$, for each hospital by using the estimate from Equation (5) and multiplying by the national observed readmission rate, denoted by $\bar{y}$. Specifically, we calculate:

Risk-Standardized Readmission Rate: $\widehat{RSRR}_i = \hat{t}_i \times \bar{y}$ (6)

Creating Interval Estimates

The measure score is a complex function of parameter estimates; therefore, we use re-sampling and simulation techniques to derive an interval estimate to determine if a hospital is performing better than, worse than, or no different than expected. A hospital is considered better than expected if the upper bound of their confidence interval falls below the national observed readmission rate, $\bar{y}$, and considered worse if the lower bound of their confidence interval falls above $\bar{y}$. A hospital is considered no different than expected if the confidence interval overlaps $\bar{y}$.

More specifically, we use bootstrapping procedures to compute confidence intervals. Because the theoretical-based standard errors are not easily derived, and to avoid making unnecessary assumptions, we use the bootstrap to empirically construct the sampling distribution for each hospital risk-standardized ratio. The bootstrapping algorithm is described below.

Bootstrapping Algorithm

Let *I* denote the total number of hospitals in the sample. We repeat steps 1 – 4 below for b = 1,2,…B times:

1. Sample *I* hospitals with replacement.
2. For each specialty cohort, fit the hierarchical logistic regression model defined by Equation (1) using all patients within each sampled hospital. The starting values are the parameter estimates obtained

by fitting the model to all hospitals. If some hospitals are selected more than once in a bootstrapped sample, we treat them as distinct so that we have *I* random effects to estimate the variance components. After Step 2, we have:

   a. The estimated regression coefficients of the risk factors, $\widehat{\boldsymbol{\beta}}^{(b)}$.
   b. The parameters governing the random effects, hospital adjusted outcomes, distribution $\hat{\mu}^{(b)}$ and $\hat{\tau}^{2(b)}$.
      c. The set of hospital-specific intercepts and corresponding variances,$\left\{\hat{\alpha}_i^{(b)}, \hat{var}\left(\alpha_i^{(b)}\right); i = 1,2,\dots,I\right\}$

3. We generate a hospital random effect by sampling from the distribution of the hospital-specific distribution obtained in Step 2c. We approximate the distribution for each random effect by a normal distribution. Thus, we draw $\alpha_i^{(b*)} \sim N(\hat{\alpha}_i^{(b)}, \hat{var}\left(\alpha_i^{(b)}\right))$ for the unique set of hospitals sampled in Step 1.
4. Within each unique hospital *i* sampled in Step 1, and for each case *j* in that hospital, we calculate $\hat{p}_{ij}^{(b)}$, $\hat{e}_{ij}^{(b)}$, and $\hat{s}_i^{(b)}$ where $\widehat{\boldsymbol{\beta}}^{(b)}$ and $\hat{\mu}^{(b)}$ are obtained from Step 2 and $\alpha_i^{(b*)}$ is obtained from Step 3.
5. After Step 4, results from all specialty cohorts are combined to derive $\hat{t}_i^{(b)}$ for each hospital.

Ninety-five percent interval estimates (or alternative interval estimates) for the hospital-standardized outcome can be computed by identifying the 2.5th and 97.5th percentiles of a large selected number of estimates for all hospitals (or the percentiles corresponding to the alternative desired intervals).[15]

Appendix B. Data QA

This production year required revision of all SAS packs to account for updates in ICD-10 codes and associated mappings of clinical groupers. To assure the quality of measure output, we utilized a multi-phase approach to QA of the HWR measure.

This section represents QA for the subset of the work CORE conducted to maintain and report the HWR measure. It does not describe the QA to process data and create the input files, nor does it include the QA for the final processing of production data for public reporting, because another contractor conducts that work.

Phase I

The first step in this year's QA process was to review changes in the cohort and outcomes definitions as determined by the measure-specific code set files that were updated to account for changes in ICD-10 coding. This included updates to the AHRQ CCS software and the HCC clinical category maps.

In general, we used both manual scan and descriptive analyses to conduct data validity checks, including cross-checking readmission information, distributions of ICD-10 codes, and frequencies of key variables.

Phase II

We updated the existing SAS pack to accommodate the new codes and updates to the measure. To assure accuracy in SAS pack coding, two analysts independently write SAS code for any major changes made in calculating the HWR measure: data preparation, sample selection, hierarchical modeling, and calculation of RSRRs. This process highlights any programming errors in syntax or logic. Once the parallel programming process is complete, the analysts cross-check their codes by analyzing datasets in parallel, checking for consistency of output, and reconciling any discrepancies.

Phase III

A third analyst reviews the finalized SAS code and recommends changes to the coding and readability of the SAS pack, where appropriate. The primary analyst receives the suggested changes for possible re-coding or program documentation when needed.

During this phase, we also compare prior years' risk-adjustment coefficients and variable frequencies to enable us to check for potential inconsistencies in the data and the impact of any changes to the SAS pack. Anything that seems outside of normal coding fluctuation is further reviewed in more detail.

Appendix C. Annual Updates

Prior annual updates for the measure can be found in the annual updates and specifications reports available on *QualityNet*. For convenience, we have listed all prior updates here under the reporting year and corresponding report. In 2013, CMS began assigning version numbers to its measures. The measure specifications in the original methodology reports are considered Version 1.0 for a measure. The measure receives a new version number for each subsequent year of public reporting.

2018

2018 Measure Updates and Specifications Report (Version 7.0 - HWR)

1. Updated the ICD-10 code-based specifications used in the measure. Specifically:
    - Applied the 2017.1 and 2017.2 versions of the AHRQ CCS to the specialty cohort definitions and planned readmission algorithm for diagnoses and procedures, respectively;
    - Incorporated the code changes that occurred in the FY 2017 version of the ICD-10-CM/PCS into the surgery/gynecology cohort definition and planned readmission algorithm;
    - Applied the FY 2017 version of the V22 CMS-HCC crosswalk maintained by RTI International to the risk models; and,
    - Conducted code surveillance to identify any specification changes warranted due to coding practices and patterns. Additionally, our clinical and measure experts reviewed the pre-existing ICD-10 code-based specifications to confirm the appropriateness of the specifications unaffected by the updates.
        - Rationale: Updated versions of the ICD-10-CM/PCS, AHRQ CCS, and CMS-HCC crosswalk were released. Revisions to the measure specifications were warranted to accommodate these updates.
2. Updated the methodology used in analytic input file production to identify transfers to rehabilitation units, to further ensure these transfers are not captured as readmissions for any hospital. In addition to the previous methods described in the 2013 and 2017 updates below and the 2010 AMI, HF, and pneumonia readmission measures maintenance report, use of revenue center codes has been implemented, to help identify these cases in ICD-10 code-based claims. Specifically:
    - 0024: Inpatient Rehabilitation Facility services paid under PPS submitted as Type of Bill 11X
    - 0118: Private medical or general-rehabilitation
    - 0128: Semi-private two bed (medical or general)-rehabilitation
    - 0148: Private (deluxe)-rehabilitation
        - Rationale: The inability to use principal discharge diagnosis codes to identify rehabilitation stays (due to ICD-10 coding guidance) has led to an under-counting of these transfers primarily for Maryland hospitals and critical access hospitals, hospitals that are not part of the Inpatient Prospective Payment System. Utilization of revenue center codes augments our ability to identify and exclude admissions to rehabilitation beds in these hospitals that are not identified through discharge disposition codes alone. Of note, rehabilitation units are most often identified by CMS certification number (CCN).
3. Removed the obstetric AHRQ CCS procedure and diagnosis categories from the planned readmission algorithm. Specifically, AHRQ CCS procedure categories 134 and 135 and AHRQ CCS

diagnosis categories 194 and 196 were deleted from the always planned procedure and diagnosis lists, Tables PR.1 and PR.2, respectively. Similarly, the obstetric AHRQ CCS procedure categories 134, 135, and 139 were deleted from the surgery/gynecology specialty cohort list. They remain in the SAS packs, but are commented out.

- Rationale: The obstetric codes were incorporated into initial measure specifications during development. They were provided for all-payer settings, but are not applicable to the CMS readmission measures that include only those patients aged 65 or over.

2017

2017 Measure Updates and Specifications Report HWR (Version 6.0)

1. Revised the measure specifications to accommodate the implementation of ICD-10 coding:
   - Updated the specialty cohort definitions, by using the most recent (2016) version of the AHRQ ICD-10 CCS for discharges on or after October 1, 2015.
   - Updated the planned readmission algorithm, by using the most recent (2016) version of the ICD-10-based AHRQ CCS and ICD-10 codes for certain "potentially planned procedures" and "acute diagnoses" to the algorithm specifications, for discharges on or after October 1, 2015.
   - Re-specified the risk model, updating the CC-based risk variables to the ICD-10-compatible Hierarchical Condition Categories (HCC) system version 22 to the model.
     - Rationale: The ICD-9 code sets used to report medical diagnoses and inpatient procedures were replaced by ICD-10 code sets on October 1, 2015. The U.S. Department of Health and Human Services (HHS) mandated that ICD-10 codes be used for medical coding, effective with October 1, 2015 discharges. The measurement period for 2017 public reporting required data from claims that include ICD-10 codes in addition to data from claims that include ICD-9 codes. Thus, re-specification was warranted to accommodate ICD-10 coding.
2. Updated the methodologies used to identify transfers to psychiatric and rehabilitation units, to ensure these transfers are not captured as readmissions for any hospital (as described in the 2013 update below and the 2010 AMI, HF, and pneumonia readmission measures maintenance report):
   - Psychiatric admissions – Criterion (2) and (3) from the 2013 update apply. However, criterion (1) was modified slightly to:
     (1) the admission being evaluated as a potential readmission has a psychiatric principal discharge diagnosis code (ICD-9-CM codes beginning with '29', '30' or '31', for discharges prior to October 1, 2015, or ICD-10-CM codes beginning with 'F', for discharges on or after October 1, 2015).
   - Rehabilitation admissions – For discharges on or after October 1, 2015, the previous approach is replaced with:
     (1) the index admission has a discharge disposition code to a rehabilitation hospital or rehabilitation unit from the index admission; and,
     (2) the admission being evaluated as a potential readmission occurred on the same day as or the day following the index discharge.
     - Rationale: With the implementation of ICD-10 coding effective with discharges on or after October 1, 2015, the ICD-9-code-based criterion developed in 2010 needed to be re-specified. For psychiatric admissions, defining "psychiatric diagnosis" with ICD-10-CM codes for discharges on or after October 1, 2015 was a simple solution, as mental health diagnosis codes all reside under the Category 'F' (Mental, Behavioral and Neurodevelopmental disorders). However, for rehabilitation admissions,

rehabilitation diagnosis codes are not coded consistently. Thus, re-defining the V57.0 ICD-9-CM code criterion with ICD-10-CM codes was not a viable option, and a different strategy was warranted.

2016

2016 Measure Updates and Specifications Report HWR (Version 5.0)

1. Re-specified the measure by updating to CMS planned readmission algorithm version 4.0.
   - Rationale: Version 4.0 incorporates improvements made following a validation study of the algorithm using data from a medical record review and input from clinical experts. These changes improve the accuracy of the algorithm by decreasing the number of readmissions that the algorithm mistakenly designates as planned/unplanned by removing five procedure categories and adding one procedure category.
2. Applied the 2015 version of the AHRQ CCS to the planned readmission algorithm, risk-adjustment models, and specialty cohort definitions.
   - Rationale: A 2015 version of the AHRQ CCS was released.

2015

2015 Measure Updates and Specifications Report HWR (Version 4.0)

1. Applied updated AHRQ CCS version to the planned readmission algorithm, risk adjustment-models, and specialty cohort definitions.
   - Rationale: An updated version of the AHRQ CCS was released in 2014.

2014

2014 Measure Updates and Specifications Report HWR (Version 3.0)

1. Re-specified the measure by updating to CMS planned readmission algorithm version 3.0.
   - Rationale: Version 3.0 incorporates improvements made following a validation study of the algorithm using data from a medical record review. These changes improve the accuracy of the algorithm by decreasing the number of readmissions that the algorithm mistakenly designated as planned by removing two procedure categories and adding several acute diagnoses.
2. Applied updated AHRQ CCS version to the planned readmission algorithm, risk adjustment-models, and specialty cohort definitions.
   - Rationale: An updated version of the AHRQ CCS was released in 2013.

2013

2013 Measure Updates and Specifications Report HWR (Version 2.0)

1. Re-specified the measure by updating to CMS planned readmission algorithm version 2.1.
   - Rationale: Version 2.1 incorporated improvements to the original algorithm made following an extensive review by clinical experts and stakeholder feedback submitted during the HWR measure's public comment period and 2012 dry run.
2. Updated CC map.
   - Rationale: The ICD-9-CM CC map is updated annually to capture all relevant comorbidities coded in patient administrative claims data.
3. Removed AHRQ CCS procedure category 61 from the list of procedures qualifying an admission for the surgery cohort.
   - Rationale: This procedure category was removed from the surgical cohort because patients undergoing this procedure are typically admitted primarily for cardiovascular or medical care.

4. Updated the methodology used to determine readmission outcome in cases of admission to psychiatric and rehabilitation hospital units.
    - Rationale: Psychiatric and rehabilitation units within short-term acute care hospitals in Maryland have the same type of provider ID number (or CCN) as the acute care hospital in which they are housed. Transfers to these units can therefore look like readmissions. In order to accurately assess readmissions in Maryland and allow for public reporting of Maryland readmission rates, methodologies to identify these cases were needed, to ensure these transfers are not captured as readmissions for any hospital. Rehabilitation admissions are identified by ICD-9-CM principal discharge diagnosis code (codes beginning with 'V57' indicate admission to a rehabilitation unit). A psychiatric admission is identified if all three of the following criteria are met:
      (1) the admission being evaluated as a potential readmission has a psychiatric principal discharge diagnosis code (ICD-9-CM codes beginning with '29', '30', or '31');
      (2) the index admission has a discharge disposition code to a psychiatric hospital or psychiatric unit from the index admission; and,
      (3) the admission being evaluated as a potential readmission occurred during the same day as or the day following the index discharge.
      Psychiatric/rehabilitation admissions identified as described above are not captured as readmissions. Note that we do not expect to see rehabilitation claims in hospital data from states other than Maryland.
    - The criteria for identifying such admissions are available in the 2010 AMI, HF, and pneumonia readmission measures maintenance report.

Appendix D. Measure Specifications

Hospital-Wide All-Cause Unplanned Readmission (NQF #1789)

Cohort

Inclusion Criteria for HWR Measure

1. **Enrolled in Medicare FFS Part A for the 12 months prior to the date of admission and during the index admission**
   Rationale: Claims data are consistently available only for Medicare FFS beneficiaries. The 12-month prior enrollment ensures a full year of administrative data is available for risk adjustment. Medicare Part A is required at the time of admission to ensure no Medicare Advantage patients are included in the measure.
2. **Aged 65 or over**
   Rationale: Medicare patients younger than 65 usually qualify for the program due to severe disability. They are not included in the measure because Medicare patients younger than 65 are considered to be too clinically distinct from Medicare patients 65 and over.
3. **Discharged alive from a non-federal short-term acute care hospital**
   Rationale: It is only possible for patients to be readmitted if they are discharged alive.
4. **Not transferred to another acute care facility**
   Rationale: Hospitalizations that result in a transfer to another acute care facility are not included in the measure because the measure's focus is on admissions that result in discharge to a non-acute care setting (for example, to home or a skilled nursing facility).

Exclusion Criteria for HWR Measure

1. **Admitted to PPS-exempt cancer hospitals**
   Rationale: These hospitals care for a unique population of patients that cannot reasonably be compared to patients admitted to other hospitals.
2. **Without at least 30 days of post-discharge enrollment in Medicare FFS**
   Rationale: The 30-day readmission outcome cannot be assessed in this group since claims data are used to determine whether a patient was readmitted.
3. **Discharged against medical advice**
   Rationale: Providers did not have the opportunity to deliver full care and prepare the patient for discharge.
4. **Admitted for primary psychiatric diagnoses**
   Rationale: Patients admitted for psychiatric treatment are typically cared for in separate psychiatric or rehabilitation centers that are not comparable to short-term acute care hospitals (Table D.1).
5. **Admitted for rehabilitation**
   Rationale: These admissions are not typically to a short-term acute care hospital and are not for acute care.
6. **Admitted for medical treatment of cancer**
   Rationale: These admissions have a different mortality and readmission profile than the rest of the Medicare population, and outcomes for these admissions do not correlate well with

outcomes for other admissions. Patients with cancer admitted for other diagnoses or for surgical treatment of their cancer remain in the measure (Table D.3).

Figure D.1 – HWR Flow Diagram of Inclusion and Exclusion Criteria and Specialty Cohort Assignment for the Index Admission

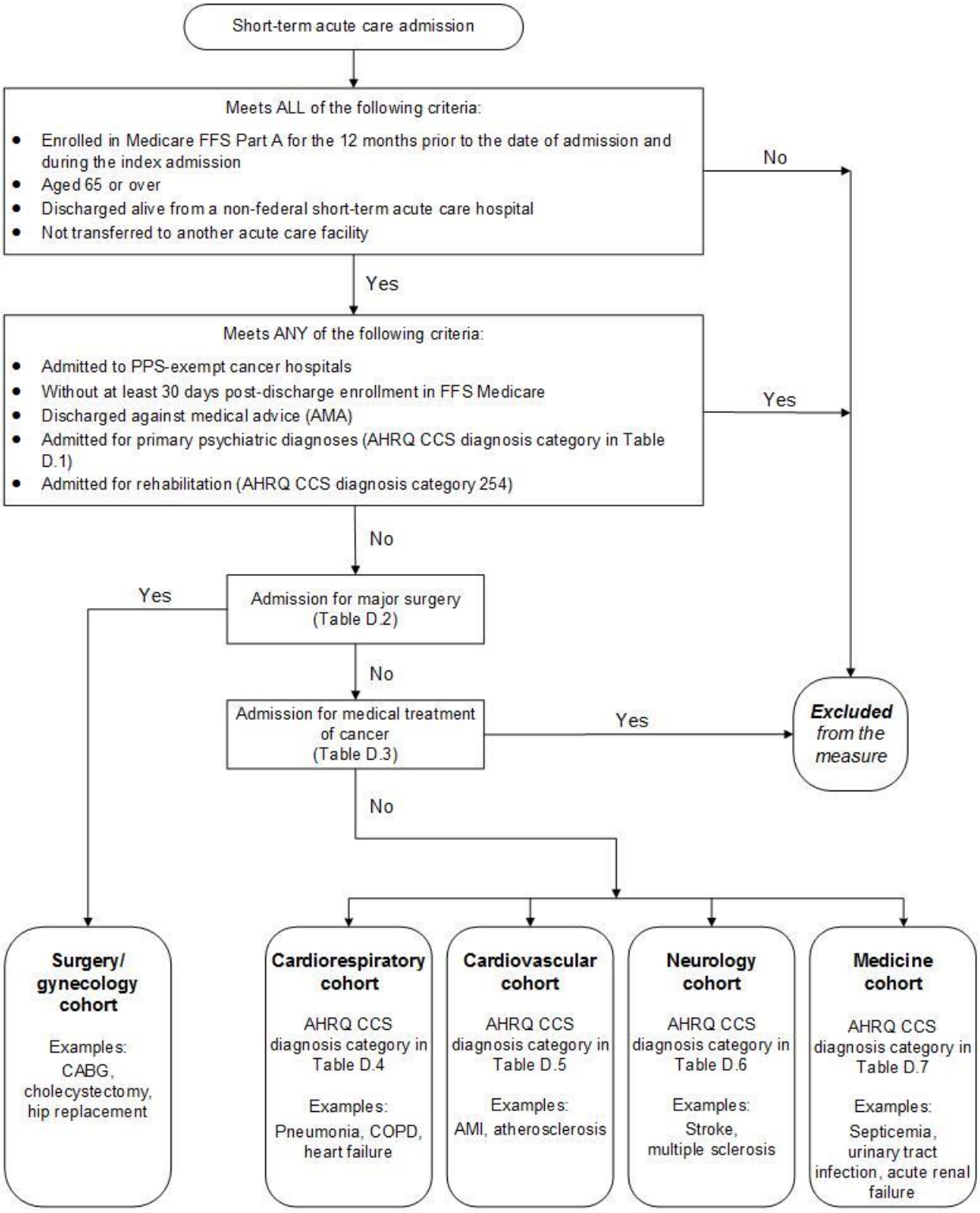


Table D.1 - Psychiatric Discharge Diagnosis Categories Excluded from the Measure

AHRQ CCS Diagnosis	Description
650	Adjustment disorders
651	Anxiety disorders
652	Attention-deficit conduct and disruptive behavior disorders
654	Developmental disorders
655	Disorders usually diagnosed in infancy childhood or adolescence
656	Impulse control disorders NEC
657	Mood disorders
658	Personality disorders
659	Schizophrenia and other psychotic disorders
662	Suicide and intentional self-inflicted injury
670	Miscellaneous mental health disorders

Table D.2 – Procedures Defining the Surgery/Gynecology Cohort

Procedure Category/ICD-10-PCS Codes	Description
AHRQ CCS Procedure Categories	
1	Incision and excision of CNS
2	Insertion; replacement; or removal of extracranial ventricular shunt
3	Excision destruction or resection of intervertebral disc
9	Other OR therapeutic nervous system procedures
10	Thyroidectomy; partial or complete
12	Therapeutic endocrine procedures
13	Corneal transplant
14	Procedures typically performed for glaucoma
15	Lens and cataract procedures
16	Repair of retina
17	Destruction of lesion of retina and choroid
20	Other intraocular therapeutic procedures
21	Other extraocular muscle and orbit therapeutic procedures
22	Tympanoplasty
23	Myringotomy
24	Mastoidectomy
26	Other therapeutic procedures on the ear nose and sinus
28	Plastic procedures on nose
30	Tonsillectomy and/or adenoidectomy
33	Other OR procedures on mouth and throat
36	Lobectomy or pneumonectomy
42	Other OR Rx procedures on respiratory system and mediastinum
43	Heart valve procedures
44	Coronary artery bypass graft (CABG)
49	Other OR heart procedures
51	Endarterectomy; vessel of head and neck
52	Aortic resection; replacement or anastomosis
53	Varicose vein stripping; lower limb
55	Peripheral vascular bypass
56	Other vascular bypass and shunt; not heart

Procedure Category/ICD-10-PCS Codes	Description
59	Other OR procedures on vessels of head and neck
60	Embolectomy and endarterectomy of lower limbs
66	Procedures on spleen
67	Other procedures; hemic and lymphatic systems
72	Colostomy; temporary and permanent
73	Ileostomy and other enterostomy
74	Gastrectomy; partial and total
75	Small bowel resection
78	Colorectal resection
79	Excision (partial) of large intestine (not endoscopic)
80	Appendectomy
84	Cholecystectomy and common duct exploration
85	Inguinal and femoral hernia repair
86	Other hernia repair
89	Exploratory laparotomy
90	Excision; lysis peritoneal adhesions
94	Other OR upper GI therapeutic procedures
96	Other OR lower GI therapeutic procedures
99	Other OR gastrointestinal therapeutic procedures
101	Transurethral excision; drainage; or removal urinary obstruction
103	Nephrotomy and nephrostomy
104	Nephrectomy; partial or complete
105	Kidney transplant
106	Genitourinary incontinence procedures
109	Procedures on the urethra
112	Other OR therapeutic procedures of urinary tract
113	Transurethral resection of prostate (TURP)
114	Open prostatectomy
118	Other OR therapeutic procedures; male genital
119	Oophorectomy; unilateral and bilateral
120	Other operations on ovary
121	Ligation or occlusion of fallopian tubes
123	Other operations on fallopian tubes
124	Hysterectomy; abdominal and vaginal
125	Other excision of cervix and uterus
129	Repair of cystocele and rectocele; obliteration of vaginal vault
131	Other non-OR therapeutic procedures; female organs
132	Other OR therapeutic procedures; female organs
133	Episiotomy
141	Other therapeutic obstetrical procedures
142	Partial excision bone
144	Fracture treatment including reposition with or without fixation; facial fracture or dislocation
145	Fracture treatment including reposition with or without fixation; radius or ulna fracture or dislocation
146	Fracture treatment including reposition with or without fixation; hip or femur fracture or dislocation
147	Fracture treatment including reposition with or without fixation; lower extremity fracture or dislocation (other than hip or femur)

Procedure Category/ICD-10-PCS Codes	Description
148	Fracture treatment including reposition with or without fixation of other fracture or dislocation
150	Division or release of joint capsule; ligament or cartilage
152	Arthroplasty knee
153	Hip replacement; total and partial
154	Arthroplasty other than hip or knee
157	Amputation of lower extremity
158	Spinal fusion
160	Other therapeutic procedures on muscles and tendons
161	Other OR therapeutic procedures on bone
162	Other OR therapeutic procedures on joints
164	Other OR therapeutic procedures on musculoskeletal system
166	Lumpectomy; quadrantectomy of breast
167	Mastectomy
172	Skin graft
175	Other OR therapeutic procedures on skin subcutaneous tissue fascia and breast
176	Organ transplantation (other than bone marrow corneal or kidney)
ICD-10-PCS Codes	
0C9030Z	Drainage of Upper Lip with Drainage Device, Percutaneous Approach
0C903ZZ	Drainage of Upper Lip, Percutaneous Approach
0C9130Z	Drainage of Lower Lip with Drainage Device, Percutaneous Approach
0C913ZZ	Drainage of Lower Lip, Percutaneous Approach
0C9230Z	Drainage of Hard Palate with Drainage Device, Percutaneous Approach
0C923ZZ	Drainage of Hard Palate, Percutaneous Approach
0C9330Z	Drainage of Soft Palate with Drainage Device, Percutaneous Approach
0C933ZZ	Drainage of Soft Palate, Percutaneous Approach
0C9430Z	Drainage of Buccal Mucosa with Drainage Device, Percutaneous Approach
0C943ZZ	Drainage of Buccal Mucosa, Percutaneous Approach
0C9730Z	Drainage of Tongue with Drainage Device, Percutaneous Approach
0C973ZZ	Drainage of Tongue, Percutaneous Approach
0C9M30Z	Drainage of Pharynx with Drainage Device, Percutaneous Approach
0C9M3ZZ	Drainage of Pharynx, Percutaneous Approach
0C9N30Z	Drainage of Uvula with Drainage Device, Percutaneous Approach
0C9N3ZZ	Drainage of Uvula, Percutaneous Approach
0C9P30Z	Drainage of Tonsils with Drainage Device, Percutaneous Approach
0C9P3ZZ	Drainage of Tonsils, Percutaneous Approach
0C9Q30Z	Drainage of Adenoids with Drainage Device, Percutaneous Approach
0C9Q3ZZ	Drainage of Adenoids, Percutaneous Approach
0C9R30Z	Drainage of Epiglottis with Drainage Device, Percutaneous Approach
0C9R3ZZ	Drainage of Epiglottis, Percutaneous Approach
0C9S30Z	Drainage of Larynx with Drainage Device, Percutaneous Approach
0C9S3ZZ	Drainage of Larynx, Percutaneous Approach
0C9T30Z	Drainage of Right Vocal Cord with Drainage Device, Percutaneous Approach
0C9T3ZZ	Drainage of Right Vocal Cord, Percutaneous Approach
0C9V30Z	Drainage of Left Vocal Cord with Drainage Device, Percutaneous Approach
0C9V3ZZ	Drainage of Left Vocal Cord, Percutaneous Approach
0CPS70Z	Removal of Drainage Device from Larynx, Via Natural or Artificial Opening
0CPS7DZ	Removal of Intraluminal Device from Larynx, Via Natural or Artificial Opening
0CPS80Z	Removal of Drainage Device from Larynx, Via Natural or Artificial Opening Endoscopic

Procedure Category/ICD-10-PCS Codes	Description
0CPS8DZ	Removal of Intraluminal Device from Larynx, Via Natural or Artificial Opening Endoscopic
0MPX30Z	Removal of Drainage Device from Upper Bursa and Ligament, Percutaneous Approach
0MPY30Z	Removal of Drainage Device from Lower Bursa and Ligament, Percutaneous Approach
0N9030Z	Drainage of Skull with Drainage Device, Percutaneous Approach
0N903ZZ	Drainage of Skull, Percutaneous Approach
0N9130Z	Drainage of Right Frontal Bone with Drainage Device, Percutaneous Approach
0N913ZZ	Drainage of Right Frontal Bone, Percutaneous Approach
0N9230Z	Drainage of Left Frontal Bone with Drainage Device, Percutaneous Approach
0N923ZZ	Drainage of Left Frontal Bone, Percutaneous Approach
0N9330Z	Drainage of Right Parietal Bone with Drainage Device, Percutaneous Approach
0N933ZZ	Drainage of Right Parietal Bone, Percutaneous Approach
0N9430Z	Drainage of Left Parietal Bone with Drainage Device, Percutaneous Approach
0N943ZZ	Drainage of Left Parietal Bone, Percutaneous Approach
0N9530Z	Drainage of Right Temporal Bone with Drainage Device, Percutaneous Approach
0N953ZZ	Drainage of Right Temporal Bone, Percutaneous Approach
0N9630Z	Drainage of Left Temporal Bone with Drainage Device, Percutaneous Approach
0N963ZZ	Drainage of Left Temporal Bone, Percutaneous Approach
0N9730Z	Drainage of Right Occipital Bone with Drainage Device, Percutaneous Approach
0N973ZZ	Drainage of Right Occipital Bone, Percutaneous Approach
0N9830Z	Drainage of Left Occipital Bone with Drainage Device, Percutaneous Approach
0N983ZZ	Drainage of Left Occipital Bone, Percutaneous Approach
0N9C30Z	Drainage of Right Sphenoid Bone with Drainage Device, Percutaneous Approach
0N9C3ZZ	Drainage of Right Sphenoid Bone, Percutaneous Approach
0N9D30Z	Drainage of Left Sphenoid Bone with Drainage Device, Percutaneous Approach
0N9D3ZZ	Drainage of Left Sphenoid Bone, Percutaneous Approach
0N9F30Z	Drainage of Right Ethmoid Bone with Drainage Device, Percutaneous Approach
0N9F3ZZ	Drainage of Right Ethmoid Bone, Percutaneous Approach
0N9G30Z	Drainage of Left Ethmoid Bone with Drainage Device, Percutaneous Approach
0N9G3ZZ	Drainage of Left Ethmoid Bone, Percutaneous Approach
0N9H30Z	Drainage of Right Lacrimal Bone with Drainage Device, Percutaneous Approach
0N9H3ZZ	Drainage of Right Lacrimal Bone, Percutaneous Approach
0N9J30Z	Drainage of Left Lacrimal Bone with Drainage Device, Percutaneous Approach
0N9J3ZZ	Drainage of Left Lacrimal Bone, Percutaneous Approach
0N9K30Z	Drainage of Right Palatine Bone with Drainage Device, Percutaneous Approach
0N9K3ZZ	Drainage of Right Palatine Bone, Percutaneous Approach
0N9L30Z	Drainage of Left Palatine Bone with Drainage Device, Percutaneous Approach
0N9L3ZZ	Drainage of Left Palatine Bone, Percutaneous Approach
0N9M30Z	Drainage of Right Zygomatic Bone with Drainage Device, Percutaneous Approach
0N9M3ZZ	Drainage of Right Zygomatic Bone, Percutaneous Approach
0N9N30Z	Drainage of Left Zygomatic Bone with Drainage Device, Percutaneous Approach
0N9N3ZZ	Drainage of Left Zygomatic Bone, Percutaneous Approach
0N9P30Z	Drainage of Right Orbit with Drainage Device, Percutaneous Approach
0N9P3ZZ	Drainage of Right Orbit, Percutaneous Approach
0N9Q30Z	Drainage of Left Orbit with Drainage Device, Percutaneous Approach
0N9Q3ZZ	Drainage of Left Orbit, Percutaneous Approach
0N9X30Z	Drainage of Hyoid Bone with Drainage Device, Percutaneous Approach
0N9X3ZZ	Drainage of Hyoid Bone, Percutaneous Approach
0NH005Z	Insertion of External Fixation Device into Skull, Open Approach

Procedure Category/ICD-10-PCS Codes	Description
0NH035Z	Insertion of External Fixation Device into Skull, Percutaneous Approach
0NH045Z	Insertion of External Fixation Device into Skull, Percutaneous Endoscopic Approach
0P9030Z	Drainage of Sternum with Drainage Device, Percutaneous Approach
0P903ZZ	Drainage of Sternum, Percutaneous Approach
0P9130Z	Drainage of Right Rib with Drainage Device, Percutaneous Approach
0P913ZZ	Drainage of Right Rib, Percutaneous Approach
0P9230Z	Drainage of Left Rib with Drainage Device, Percutaneous Approach
0P923ZZ	Drainage of Left Rib, Percutaneous Approach
0P9330Z	Drainage of Cervical Vertebra with Drainage Device, Percutaneous Approach
0P933ZZ	Drainage of Cervical Vertebra, Percutaneous Approach
0P9430Z	Drainage of Thoracic Vertebra with Drainage Device, Percutaneous Approach
0P943ZZ	Drainage of Thoracic Vertebra, Percutaneous Approach
0P9530Z	Drainage of Right Scapula with Drainage Device, Percutaneous Approach
0P953ZZ	Drainage of Right Scapula, Percutaneous Approach
0P9630Z	Drainage of Left Scapula with Drainage Device, Percutaneous Approach
0P963ZZ	Drainage of Left Scapula, Percutaneous Approach
0P9730Z	Drainage of Right Glenoid Cavity with Drainage Device, Percutaneous Approach
0P973ZZ	Drainage of Right Glenoid Cavity, Percutaneous Approach
0P9830Z	Drainage of Left Glenoid Cavity with Drainage Device, Percutaneous Approach
0P983ZZ	Drainage of Left Glenoid Cavity, Percutaneous Approach
0P9930Z	Drainage of Right Clavicle with Drainage Device, Percutaneous Approach
0P993ZZ	Drainage of Right Clavicle, Percutaneous Approach
0P9B30Z	Drainage of Left Clavicle with Drainage Device, Percutaneous Approach
0P9B3ZZ	Drainage of Left Clavicle, Percutaneous Approach
0P9C30Z	Drainage of Right Humeral Head with Drainage Device, Percutaneous Approach
0P9C3ZZ	Drainage of Right Humeral Head, Percutaneous Approach
0P9D30Z	Drainage of Left Humeral Head with Drainage Device, Percutaneous Approach
0P9D3ZZ	Drainage of Left Humeral Head, Percutaneous Approach
0P9F30Z	Drainage of Right Humeral Shaft with Drainage Device, Percutaneous Approach
0P9F3ZZ	Drainage of Right Humeral Shaft, Percutaneous Approach
0P9G30Z	Drainage of Left Humeral Shaft with Drainage Device, Percutaneous Approach
0P9G3ZZ	Drainage of Left Humeral Shaft, Percutaneous Approach
0P9H30Z	Drainage of Right Radius with Drainage Device, Percutaneous Approach
0P9H3ZZ	Drainage of Right Radius, Percutaneous Approach
0P9J30Z	Drainage of Left Radius with Drainage Device, Percutaneous Approach
0P9J3ZZ	Drainage of Left Radius, Percutaneous Approach
0P9K30Z	Drainage of Right Ulna with Drainage Device, Percutaneous Approach
0P9K3ZZ	Drainage of Right Ulna, Percutaneous Approach
0P9L30Z	Drainage of Left Ulna with Drainage Device, Percutaneous Approach
0P9L3ZZ	Drainage of Left Ulna, Percutaneous Approach
0P9M30Z	Drainage of Right Carpal with Drainage Device, Percutaneous Approach
0P9M3ZZ	Drainage of Right Carpal, Percutaneous Approach
0P9N30Z	Drainage of Left Carpal with Drainage Device, Percutaneous Approach
0P9N3ZZ	Drainage of Left Carpal, Percutaneous Approach
0P9P30Z	Drainage of Right Metacarpal with Drainage Device, Percutaneous Approach
0P9P3ZZ	Drainage of Right Metacarpal, Percutaneous Approach
0P9Q30Z	Drainage of Left Metacarpal with Drainage Device, Percutaneous Approach
0P9Q3ZZ	Drainage of Left Metacarpal, Percutaneous Approach

Procedure Category/ICD-10-PCS Codes	Description
0P9R30Z	Drainage of Right Thumb Phalanx with Drainage Device, Percutaneous Approach
0P9R3ZZ	Drainage of Right Thumb Phalanx, Percutaneous Approach
0P9S30Z	Drainage of Left Thumb Phalanx with Drainage Device, Percutaneous Approach
0P9S3ZZ	Drainage of Left Thumb Phalanx, Percutaneous Approach
0P9T30Z	Drainage of Right Finger Phalanx with Drainage Device, Percutaneous Approach
0P9T3ZZ	Drainage of Right Finger Phalanx, Percutaneous Approach
0P9V30Z	Drainage of Left Finger Phalanx with Drainage Device, Percutaneous Approach
0P9V3ZZ	Drainage of Left Finger Phalanx, Percutaneous Approach
0PPY30Z	Removal of Drainage Device from Upper Bone, Percutaneous Approach
0Q9030Z	Drainage of Lumbar Vertebra with Drainage Device, Percutaneous Approach
0Q903ZZ	Drainage of Lumbar Vertebra, Percutaneous Approach
0Q9130Z	Drainage of Sacrum with Drainage Device, Percutaneous Approach
0Q913ZZ	Drainage of Sacrum, Percutaneous Approach
0Q9230Z	Drainage of Right Pelvic Bone with Drainage Device, Percutaneous Approach
0Q923ZZ	Drainage of Right Pelvic Bone, Percutaneous Approach
0Q9330Z	Drainage of Left Pelvic Bone with Drainage Device, Percutaneous Approach
0Q933ZZ	Drainage of Left Pelvic Bone, Percutaneous Approach
0Q9430Z	Drainage of Right Acetabulum with Drainage Device, Percutaneous Approach
0Q943ZZ	Drainage of Right Acetabulum, Percutaneous Approach
0Q9530Z	Drainage of Left Acetabulum with Drainage Device, Percutaneous Approach
0Q953ZZ	Drainage of Left Acetabulum, Percutaneous Approach
0Q9630Z	Drainage of Right Upper Femur with Drainage Device, Percutaneous Approach
0Q963ZZ	Drainage of Right Upper Femur, Percutaneous Approach
0Q9730Z	Drainage of Left Upper Femur with Drainage Device, Percutaneous Approach
0Q973ZZ	Drainage of Left Upper Femur, Percutaneous Approach
0Q9830Z	Drainage of Right Femoral Shaft with Drainage Device, Percutaneous Approach
0Q983ZZ	Drainage of Right Femoral Shaft, Percutaneous Approach
0Q9930Z	Drainage of Left Femoral Shaft with Drainage Device, Percutaneous Approach
0Q993ZZ	Drainage of Left Femoral Shaft, Percutaneous Approach
0Q9B30Z	Drainage of Right Lower Femur with Drainage Device, Percutaneous Approach
0Q9B3ZZ	Drainage of Right Lower Femur, Percutaneous Approach
0Q9C30Z	Drainage of Left Lower Femur with Drainage Device, Percutaneous Approach
0Q9C3ZZ	Drainage of Left Lower Femur, Percutaneous Approach
0Q9D30Z	Drainage of Right Patella with Drainage Device, Percutaneous Approach
0Q9D3ZZ	Drainage of Right Patella, Percutaneous Approach
0Q9F30Z	Drainage of Left Patella with Drainage Device, Percutaneous Approach
0Q9F3ZZ	Drainage of Left Patella, Percutaneous Approach
0Q9G30Z	Drainage of Right Tibia with Drainage Device, Percutaneous Approach
0Q9G3ZZ	Drainage of Right Tibia, Percutaneous Approach
0Q9H30Z	Drainage of Left Tibia with Drainage Device, Percutaneous Approach
0Q9H3ZZ	Drainage of Left Tibia, Percutaneous Approach
0Q9J30Z	Drainage of Right Fibula with Drainage Device, Percutaneous Approach
0Q9J3ZZ	Drainage of Right Fibula, Percutaneous Approach
0Q9K30Z	Drainage of Left Fibula with Drainage Device, Percutaneous Approach
0Q9K3ZZ	Drainage of Left Fibula, Percutaneous Approach
0Q9L30Z	Drainage of Right Tarsal with Drainage Device, Percutaneous Approach
0Q9L3ZZ	Drainage of Right Tarsal, Percutaneous Approach
0Q9M30Z	Drainage of Left Tarsal with Drainage Device, Percutaneous Approach

Procedure Category/ICD-10-PCS Codes	Description
0Q9M3ZZ	Drainage of Left Tarsal, Percutaneous Approach
0Q9N30Z	Drainage of Right Metatarsal with Drainage Device, Percutaneous Approach
0Q9N3ZZ	Drainage of Right Metatarsal, Percutaneous Approach
0Q9P30Z	Drainage of Left Metatarsal with Drainage Device, Percutaneous Approach
0Q9P3ZZ	Drainage of Left Metatarsal, Percutaneous Approach
0Q9Q30Z	Drainage of Right Toe Phalanx with Drainage Device, Percutaneous Approach
0Q9Q3ZZ	Drainage of Right Toe Phalanx, Percutaneous Approach
0Q9R30Z	Drainage of Left Toe Phalanx with Drainage Device, Percutaneous Approach
0Q9R3ZZ	Drainage of Left Toe Phalanx, Percutaneous Approach
0Q9S30Z	Drainage of Coccyx with Drainage Device, Percutaneous Approach
0Q9S3ZZ	Drainage of Coccyx, Percutaneous Approach
0QPY30Z	Removal of Drainage Device from Lower Bone, Percutaneous Approach
0W9230Z	Drainage of Face with Drainage Device, Percutaneous Approach
0W923ZZ	Drainage of Face, Percutaneous Approach
0W9330Z	Drainage of Oral Cavity and Throat with Drainage Device, Percutaneous Approach
0W933ZZ	Drainage of Oral Cavity and Throat, Percutaneous Approach
0W9430Z	Drainage of Upper Jaw with Drainage Device, Percutaneous Approach
0W943ZZ	Drainage of Upper Jaw, Percutaneous Approach
0W9530Z	Drainage of Lower Jaw with Drainage Device, Percutaneous Approach
0W953ZZ	Drainage of Lower Jaw, Percutaneous Approach
0W9630Z	Drainage of Neck with Drainage Device, Percutaneous Approach
0W963ZZ	Drainage of Neck, Percutaneous Approach

Table D.3 - Cancer Discharge Diagnosis Categories Excluded from the Measure for Admissions Not Included in the Surgical Cohort

AHRQ CCS Diagnosis	Description
11	Cancer of head and neck
12	Cancer of esophagus
13	Cancer of stomach
14	Cancer of colon
15	Cancer of rectum and anus
16	Cancer of liver and intrahepatic bile duct
17	Cancer of pancreas
18	Cancer of other GI organs; peritoneum
19	Cancer of bronchus; lung
20	Cancer; other respiratory and intrathoracic
21	Cancer of bone and connective tissue
22	Melanomas of skin
23	Other non-epithelial cancer of skin
24	Cancer of breast
25	Cancer of uterus
26	Cancer of cervix
27	Cancer of ovary
28	Cancer of other female genital organs
29	Cancer of prostate
30	Cancer of testis

AHRQ CCS Diagnosis	Description
31	Cancer of other male genital organs
32	Cancer of bladder
33	Cancer of kidney and renal pelvis
34	Cancer of other urinary organs
35	Cancer of brain and nervous system
36	Cancer of thyroid
37	Hodgkin`s disease
38	Non-Hodgkin`s lymphoma
39	Leukemias
40	Multiple myeloma
41	Cancer; other and unspecified primary
42	Secondary malignancies
43	Malignant neoplasm without specification of site
44	Neoplasms of unspecified nature or uncertain behavior
45	Maintenance chemotherapy; radiotherapy

Table D.4 – Diagnosis Categories Defining the Cardiorespiratory Cohort

AHRQ CCS Diagnosis	Description
56	Cystic fibrosis
103	Pulmonary heart disease
108	Congestive heart failure; nonhypertensive
122	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)
125	Acute bronchitis
127	Chronic obstructive pulmonary disease and bronchiectasis
128	Asthma
131	Respiratory failure; insufficiency; arrest (adult)

Table D.5 – Diagnosis Categories Defining the Cardiovascular Cohort

AHRQ CCS Diagnosis	Description
96	Heart valve disorders
97	Peri-; endo-; and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease)
100	Acute myocardial infarction
101	Coronary atherosclerosis and other heart disease
102	Nonspecific chest pain
104	Other and ill-defined heart disease
105	Conduction disorders
106	Cardiac dysrhythmias
107	Cardiac arrest and ventricular fibrillation
114	Peripheral and visceral atherosclerosis
115	Aortic; peripheral; and visceral artery aneurysms
116	Aortic and peripheral arterial embolism or thrombosis
117	Other circulatory disease
213	Cardiac and circulatory congenital anomalies

Table D.6 – Diagnosis Categories Defining the Neurology Cohort

AHRQ CCS Diagnosis	Description
78	Other CNS infection and poliomyelitis
79	Parkinson`s disease
80	Multiple sclerosis
81	Other hereditary and degenerative nervous system conditions
82	Paralysis
83	Epilepsy; convulsions
85	Coma; stupor; and brain damage
95	Other nervous system disorders
109	Acute cerebrovascular disease
110	Occlusion or stenosis of precerebral arteries
111	Other and ill-defined cerebrovascular disease
112	Transient cerebral ischemia
113	Late effects of cerebrovascular disease
216	Nervous system congenital anomalies
227	Spinal cord injury
233	Intracranial injury

Table D.7 – Diagnosis Categories Defining the Medicine Cohort

AHRQ CCS Diagnosis	Description
1	Tuberculosis
2	Septicemia (except in labor)
3	Bacterial infection; unspecified site
4	Mycoses
5	HIV infection
6	Hepatitis
7	Viral infection
8	Other infections; including parasitic
9	Sexually transmitted infections (not HIV or hepatitis)
10	Immunizations and screening for infectious disease
46	Benign neoplasm of uterus
47	Other and unspecified benign neoplasm
48	Thyroid disorders
49	Diabetes mellitus without complication
50	Diabetes mellitus with complications
51	Other endocrine disorders
52	Nutritional deficiencies
53	Disorders of lipid metabolism
54	Gout and other crystal arthropathies
55	Fluid and electrolyte disorders
57	Immunity disorders
58	Other nutritional; endocrine; and metabolic disorders
59	Deficiency and other anemia
60	Acute posthemorrhagic anemia
61	Sickle cell anemia
62	Coagulation and hemorrhagic disorders

AHRQ CCS Diagnosis	Description
63	Diseases of white blood cells
64	Other hematologic conditions
76	Meningitis (except that caused by tuberculosis or sexually transmitted disease)
77	Encephalitis (except that caused by tuberculosis or sexually transmitted disease)
84	Headache; including migraine
86	Cataract
87	Retinal detachments; defects; vascular occlusion; and retinopathy
88	Glaucoma
89	Blindness and vision defects
90	Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease)
91	Other eye disorders
92	Otitis media and related conditions
93	Conditions associated with dizziness or vertigo
94	Other ear and sense organ disorders
98	Essential hypertension
99	Hypertension with complications and secondary hypertension
118	Phlebitis; thrombophlebitis and thromboembolism
119	Varicose veins of lower extremity
120	Hemorrhoids
121	Other diseases of veins and lymphatics
123	Influenza
124	Acute and chronic tonsillitis
126	Other upper respiratory infections
129	Aspiration pneumonitis; food/vomitus
130	Pleurisy; pneumothorax; pulmonary collapse
132	Lung disease due to external agents
133	Other lower respiratory disease
134	Other upper respiratory disease
135	Intestinal infection
136	Disorders of teeth and jaw
137	Diseases of mouth; excluding dental
138	Esophageal disorders
139	Gastroduodenal ulcer (except hemorrhage)
140	Gastritis and duodenitis
141	Other disorders of stomach and duodenum
142	Appendicitis and other appendiceal conditions
143	Abdominal hernia
144	Regional enteritis and ulcerative colitis
145	Intestinal obstruction without hernia
146	Diverticulosis and diverticulitis
147	Anal and rectal conditions
148	Peritonitis and intestinal abscess
149	Biliary tract disease
151	Other liver diseases
152	Pancreatic disorders (not diabetes)
153	Gastrointestinal hemorrhage
154	Noninfectious gastroenteritis
155	Other gastrointestinal disorders

AHRQ CCS Diagnosis	Description
156	Nephritis; nephrosis; renal sclerosis
157	Acute and unspecified renal failure
158	Chronic kidney disease
159	Urinary tract infections
160	Calculus of urinary tract
161	Other diseases of kidney and ureters
162	Other diseases of bladder and urethra
163	Genitourinary symptoms and ill-defined conditions
164	Hyperplasia of prostate
165	Inflammatory conditions of male genital organs
166	Other male genital disorders
167	Nonmalignant breast conditions
168	Inflammatory diseases of female pelvic organs
169	Endometriosis
170	Prolapse of female genital organs
171	Menstrual disorders
172	Ovarian cyst
173	Menopausal disorders
175	Other female genital disorders
197	Skin and subcutaneous tissue infections
198	Other inflammatory condition of skin
199	Chronic ulcer of skin
200	Other skin disorders
201	Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease)
202	Rheumatoid arthritis and related disease
203	Osteoarthritis
204	Other non-traumatic joint disorders
205	Spondylosis; intervertebral disc disorders; other back problems
206	Osteoporosis
207	Pathological fracture
208	Acquired foot deformities
209	Other acquired deformities
210	Systemic lupus erythematosus and connective tissue disorders
211	Other connective tissue disease
212	Other bone disease and musculoskeletal deformities
214	Digestive congenital anomalies
215	Genitourinary congenital anomalies
217	Other congenital anomalies
225	Joint disorders and dislocations; trauma-related
226	Fracture of neck of femur (hip)
228	Skull and face fractures
229	Fracture of upper limb
230	Fracture of lower limb
231	Other fractures
232	Sprains and strains
234	Crushing injury or internal injury
235	Open wounds of head; neck; and trunk
236	Open wounds of extremities

AHRQ CCS Diagnosis	Description
237	Complication of device; implant or graft
238	Complications of surgical procedures or medical care
239	Superficial injury; contusion
240	Burns
241	Poisoning by psychotropic agents
242	Poisoning by other medications and drugs
243	Poisoning by nonmedicinal substances
244	Other injuries and conditions due to external causes
245	Syncope
246	Fever of unknown origin
247	Lymphadenitis
248	Gangrene
249	Shock
250	Nausea and vomiting
251	Abdominal pain
252	Malaise and fatigue
253	Allergic reactions
255	Administrative/social admission
256	Medical examination/evaluation
257	Other aftercare
258	Other screening for suspected conditions (not mental disorders or infectious disease)
259	Residual codes; unclassified
653	Delirium dementia and amnestic and other cognitive disorders
660	Alcohol-related disorders
661	Substance-related disorders
663	Screening and history of mental health and substance abuse codes
2617	Adverse effects of medical drugs

Risk Adjustment

The CCs outlined in Table D.8 below are used to identify risk variables in claims for discharges on or after October 1, 2015 as well as discharges prior to October 1, 2015.

Table D.8 – Comorbidity Risk Variables Common to All HWR Specialty Cohorts

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
Age minus 65 (years above 65, continuous)	n/a	
Severe infection (CC 1, 3-6)	HIV/AIDS (CC 1)	
	Bacterial, fungal, and parasitic central nervous system infections (CC 3)	
	Viral and late effects central nervous system infections (CC 4)	
	Tuberculosis (CC 5)	
	Opportunistic infections (CC 6)	
Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	Septicemia, sepsis, systemic inflammatory response syndrome/shock (CC 2)	X
Other infectious diseases and pneumonias (CC 7, 114-116)	Other infectious diseases (CC 7)	X
	Aspiration and specified bacterial pneumonias (CC 114)	X
	Pneumococcal pneumonia, empyema, lung abscess (CC 115)	X
	Viral and unspecified pneumonia, pleurisy (CC 116)	
Metastatic cancer and acute leukemia (CC 8)	Metastatic cancer and acute leukemia (CC 8)	
Severe cancer (CC 9-10)	Lung and other severe cancers (CC 9)	
	Lymphoma and other cancers (CC 10)	
Other cancers (CC 11-14)	Colorectal, bladder, and other cancers (CC 11)	
	Breast, prostate, and other cancers and tumors (CC 12)	
	Other respiratory and heart neoplasms (CC 13)	
	Other digestive and urinary neoplasms (CC 14)	
Diabetes mellitus (DM) or DM complications (CC 17-19, 122-123)	Diabetes with acute complications (CC 17)	X
	Diabetes with chronic complications (CC 18)	
	Diabetes without complications (CC 19)	
	Proliferative diabetic retinopathy and vitreous hemorrhage (CC 122)	
	Diabetic and other vascular retinopathies (CC 123)	
Protein-calorie malnutrition (CC 21)	Protein-calorie malnutrition (CC 21)	
Other significant endocrine and metabolic disorders; disorders of fluid/electrolyte/acid-base balance (CC 23-24)	Other significant endocrine and metabolic disorders (CC 23)	
	Disorders of fluid/electrolyte/acid-base balance (CC 24)	X
End-stage liver disease; cirrhosis of liver (CC 27-28)	End-stage liver disease (CC 27)	
	Cirrhosis of liver (CC 28)	
Pancreatic disease; peptic ulcer, hemorrhage, other specified	Chronic pancreatitis (CC 34)	
	Peptic ulcer, hemorrhage, other specified	X

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
gastrointestinal disorders (CC 34, 36)	gastrointestinal disorders (CC 36)	
Rheumatoid arthritis and inflammatory connective tissue disease (CC 40)	Rheumatoid arthritis and inflammatory connective tissue disease (CC 40)	
Severe hematological disorders (CC 46)	Severe hematological disorders (CC 46)	
Coagulation defects and other specified hematological disorders (CC 48)	Coagulation defects and other specified hematological disorders (CC 48)	X
Iron deficiency or other/unspecified anemias and blood disease (CC 49)	Iron deficiency or other/unspecified anemias and blood disease (CC 49)	
Drug/alcohol psychosis or dependence (CC 54-55)	Drug/alcohol psychosis (CC 54)	
	Drug/alcohol dependence (CC 55)	
Psychiatric comorbidity (CC 57-59, 61, 63)	Schizophrenia (CC 57)	
	Major depressive, bipolar, and paranoid disorders (CC 58)	
	Reactive and unspecified psychosis (CC 59)	
	Depression (CC 61)	
	Other psychiatric disorders (CC 63)	
Hemiplegia, paraplegia, paralysis, functional disability (CC 70-74, 103-104, 189-190)	Quadriplegia (CC 70)	
	Paraplegia (CC 71)	
	Spinal cord disorders/injuries (CC 72)	
	Amyotrophic lateral sclerosis and other motor neuron disease (CC 73)	
	Cerebral palsy (CC 74)	
	Hemiplegia/hemiparesis (CC 103)	X
	Monoplegia, other paralytic syndromes (CC 104)	X
	Amputation status, lower limb/amputation complications (CC 189)	X
	Amputation status, upper limb (CC 190)	X
Seizure disorders and convulsions (CC 79)	Seizure disorders and convulsions (CC 79)	
Respirator dependence/tracheostomy status (CC 82)	Respirator dependence/tracheostomy status (CC 82)	X
Cardio-respiratory failure and shock	Cardio-respiratory failure and shock (CC 84 plus ICD-10-CM codes R09.01 and R09.02, for discharges on or after October 1, 2015; CC 84 plus ICD-9-CM codes 799.01 and 799.02, for discharges prior to October 1, 2015)	X
Congestive heart failure (CC 85)	Congestive heart failure (CC 85)	X
Coronary atherosclerosis or angina, cerebrovascular disease (CC 86-89, 102, 105-109)	Acute myocardial infarction (CC 86)	X
	Unstable angina and other acute ischemic heart disease (CC 87)	X
	Angina pectoris (CC 88)	
	Coronary atherosclerosis/other chronic ischemic heart disease (CC 89)	
	Cerebrovascular atherosclerosis, aneurysm, and other disease (CC 102)	

Description of Risk Variable	CCs and/or ICD Codes Included	Variables Not Used in Risk Adjustment if Occurred Only during Index Admission (indicated by "X")
	Late effects of cerebrovascular disease, except paralysis (CC 105)	
	Atherosclerosis of the extremities with ulceration or gangrene (CC 106)	X
	Vascular disease with complications (CC 107)	X
	Vascular disease (CC 108)	X
	Other circulatory disease (CC 109)	X
Specified arrhythmias and other heart rhythm disorders (CC 96-97)	Specified heart arrhythmias (CC 96)	X
	Other heart rhythm and conduction disorders (CC 97)	X
Chronic obstructive pulmonary disease (COPD) (CC 111)	Chronic obstructive pulmonary disease (COPD) (CC 111)	
Fibrosis of lung or other chronic lung disorders (CC 112)	Fibrosis of lung or other chronic lung disorders (CC 112)	
Transplants (CC 132, 186)	Kidney transplant status (CC 132)	
	Major organ transplant or replacement status (CC 186)	X
Dialysis status (CC 134)	Dialysis status (CC 134)	X
Renal failure (CC 135-140)	Acute renal failure (CC 135)	X
	Chronic kidney disease, stage 5 (CC 136)	
	Chronic kidney disease, severe (stage 4) (CC 137)	
	Chronic kidney disease, moderate (stage 3) (CC 138)	
	Chronic kidney disease, mild or unspecified (stages 1-2 or unspecified) (CC 139)	
	Unspecified renal failure (CC 140)	X
Decubitus ulcer or chronic skin ulcer (CC 157-161)	Pressure ulcer of skin with necrosis through to muscle, tendon, or bone (CC 157)	X
	Pressure ulcer of skin with full thickness skin loss (CC 158)	X
	Pressure ulcer of skin with partial thickness skin loss (CC 159)	X
	Pressure pre-ulcer skin changes or unspecified stage (CC 160)	X
	Chronic ulcer of skin, except pressure (CC 161)	
Hip fracture/dislocation (CC 170)	Hip fracture/dislocation (CC 170)	X

Outcome

Outcome Criteria for HWR Measure

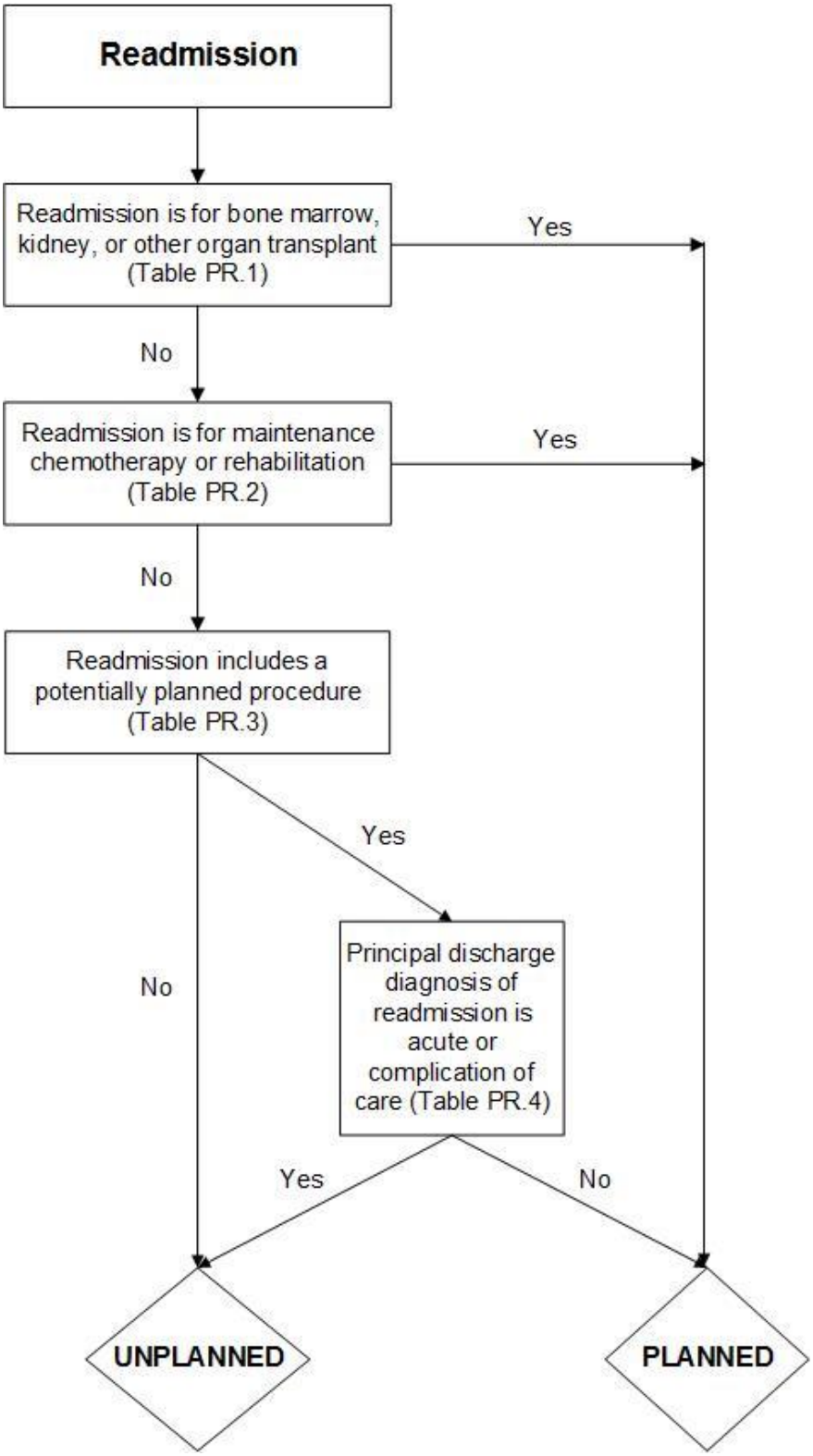
Unplanned readmission, from any cause, within 30 days from the date of discharge from an index admission.

Rationale: Planned readmissions are generally not a signal of quality of care. Including planned readmissions in a readmission measure could create a disincentive to provide appropriate care to patients who are scheduled for elective or necessary procedures within 30 days of discharge. From a patient perspective, an unplanned readmission from any cause is an adverse event. Outcomes occurring within 30 days of discharge can be influenced by hospital care and the early transition to

the non-acute care setting. The 30-day time frame is a clinically meaningful period for hospitals to collaborate with their communities to reduce readmissions.

Appendix E. Planned Readmission Algorithm

Figure PR.1 - Planned Readmission Algorithm Version 4.0 2018 (ICD-10) Flowchart



Planned Readmission Algorithm Version 4.0 2018 (ICD-10) Tables – HWR Measure

Note that the singular ICD-10 codes described in Tables PR.3 and PR.4 are listed in the supplemental Excel file on *QualityNet*; hyperlinks to these lists are provided in the tables.

Table PR.1 - Procedure Categories That Are Always Planned (Version 4.0 2018 [ICD-10])

AHRQ CCS Procedure	Description
64	Bone marrow transplant
105	Kidney transplant
176	Other organ transplantation (other than bone marrow corneal or kidney)

Table PR.2 – Diagnosis Categories That Are Always Planned (Version 4.0 2018 [ICD-10])

AHRQ CCS Diagnosis	Description
45	Maintenance chemotherapy; radiotherapy
254	Rehabilitation care; fitting of prostheses; and adjustment of devices

Table PR.3 – Potentially Planned Procedures (Version 4.0 2018 [ICD-10])

Procedure Category/ICD-10-PCS Codes	Description
AHRQ CCS Procedure Categories	
1	Incision and excision of CNS
3	Excision destruction or resection of intervertebral disc
5	Insertion of catheter or spinal stimulator and injection into spinal canal
9	Other OR therapeutic nervous system procedures
10	Thyroidectomy; partial or complete
12	Therapeutic endocrine procedures
33	Other OR procedures on mouth and throat
36	Lobectomy or pneumonectomy
38	Other diagnostic procedures on lung and bronchus
40	Other diagnostic procedures on the respiratory system and mediastinum
43	Heart valve procedures
44	Coronary artery bypass graft (CABG)
45	Percutaneous transluminal coronary angioplasty (PTCA) with or without stent placement
49	Other OR heart procedures
51	Endarterectomy; vessel of head and neck
52	Aortic resection; replacement or anastomosis
53	Varicose vein stripping; lower limb
55	Peripheral vascular bypass
56	Other vascular bypass and shunt; not heart
59	Other OR procedures on vessels of head and neck
66	Procedures on spleen
67	Other procedures; hemic and lymphatic systems
74	Gastrectomy; partial and total
78	Colorectal resection
79	Excision (partial) of large intestine (not endoscopic)
84	Cholecystectomy and common duct exploration

Procedure Category/ICD-10-PCS Codes	Description
85	Inguinal and femoral hernia repair
86	Other hernia repair
99	Other OR gastrointestinal therapeutic procedures
104	Nephrectomy; partial or complete
106	Genitourinary incontinence procedures
107	Extracorporeal lithotripsy; urinary
109	Procedures on the urethra
112	Other OR therapeutic procedures of urinary tract
113	Transurethral resection of prostate (TURP)
114	Open prostatectomy
119	Oophorectomy; unilateral and bilateral
120	Other operations on ovary
124	Hysterectomy; abdominal and vaginal
129	Repair of cystocele and rectocele; obliteration of vaginal vault
132	Other OR therapeutic procedures; female organs
142	Partial excision bone
152	Arthroplasty knee
153	Hip replacement; total and partial
154	Arthroplasty other than hip or knee
158	Spinal fusion
159	Other diagnostic procedures on musculoskeletal system
166	Lumpectomy; quadrantectomy of breast
167	Mastectomy
172	Skin graft
175	Other OR therapeutic procedures on skin subcutaneous tissue fascia and breast
ICD-10-PCS Codes - ICD-10-PCS code list posted on *QualityNet*	

Table PR.4 – Acute Diagnoses (Version 4.0 2018 [ICD-10])

Diagnosis Category/ICD-10-CM Codes	Description
AHRQ CCS Diagnosis Categories	
1	Tuberculosis
2	Septicemia (except in labor)
3	Bacterial infection; unspecified site
4	Mycoses
5	HIV infection
7	Viral infection
8	Other infections; including parasitic
9	Sexually transmitted infections (not HIV or hepatitis)
54	Gout and other crystal arthropathies
55	Fluid and electrolyte disorders
60	Acute posthemorrhagic anemia
61	Sickle cell anemia
63	Diseases of white blood cells
76	Meningitis (except that caused by tuberculosis or sexually transmitted disease)
77	Encephalitis (except that caused by tuberculosis or sexually transmitted disease)
78	Other CNS infection and poliomyelitis
82	Paralysis

Diagnosis Category/ICD-10-CM Codes	Description
83	Epilepsy; convulsions
84	Headache; including migraine
85	Coma; stupor; and brain damage
87	Retinal detachments; defects; vascular occlusion; and retinopathy
89	Blindness and vision defects
90	Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease)
91	Other eye disorders
92	Otitis media and related conditions
93	Conditions associated with dizziness or vertigo
99	Hypertension with complications and secondary hypertension
102	Nonspecific chest pain
104	Other and ill-defined heart disease
107	Cardiac arrest and ventricular fibrillation
109	Acute cerebrovascular disease
112	Transient cerebral ischemia
116	Aortic and peripheral arterial embolism or thrombosis
118	Phlebitis; thrombophlebitis and thromboembolism
120	Hemorrhoids
122	Pneumonia (except that caused by tuberculosis or sexually transmitted disease)
123	Influenza
124	Acute and chronic tonsillitis
125	Acute bronchitis
126	Other upper respiratory infections
127	Chronic obstructive pulmonary disease and bronchiectasis
128	Asthma
129	Aspiration pneumonitis; food/vomitus
130	Pleurisy; pneumothorax; pulmonary collapse
131	Respiratory failure; insufficiency; arrest (adult)
135	Intestinal infection
137	Diseases of mouth; excluding dental
139	Gastroduodenal ulcer (except hemorrhage)
140	Gastritis and duodenitis
142	Appendicitis and other appendiceal conditions
145	Intestinal obstruction without hernia
146	Diverticulosis and diverticulitis
148	Peritonitis and intestinal abscess
153	Gastrointestinal hemorrhage
154	Noninfectious gastroenteritis
157	Acute and unspecified renal failure
159	Urinary tract infections
165	Inflammatory conditions of male genital organs
168	Inflammatory diseases of female pelvic organs
172	Ovarian cyst
197	Skin and subcutaneous tissue infections
198	Other inflammatory condition of skin
226	Fracture of neck of femur (hip)
227	Spinal cord injury
229	Fracture of upper limb

Diagnosis Category/ICD-10-CM Codes	Description
233	Intracranial injury
234	Crushing injury or internal injury
235	Open wounds of head; neck; and trunk
238	Complications of surgical procedures or medical care
239	Superficial injury; contusion
240	Burns
241	Poisoning by psychotropic agents
242	Poisoning by other medications and drugs
243	Poisoning by nonmedicinal substances
244	Other injuries and conditions due to external causes
245	Syncope
246	Fever of unknown origin
247	Lymphadenitis
249	Shock
250	Nausea and vomiting
251	Abdominal pain
252	Malaise and fatigue
253	Allergic reactions
259	Residual codes; unclassified
650	Adjustment disorders
651	Anxiety disorders
652	Attention-deficit conduct and disruptive behavior disorders
653	Delirium dementia and amnestic and other cognitive disorders
656	Impulse control disorders NEC
658	Personality disorders
660	Alcohol-related disorders
661	Substance-related disorders
662	Suicide and intentional self-inflicted injury
663	Screening and history of mental health and substance abuse codes
670	Miscellaneous mental health disorders
ICD-10-CM Codes - ICD-10-CM code list posted on *QualityNet*	

Immunizations for Adolescents (IMA)

SUMMARY OF CHANGES TO HEDIS 2020

- Modified value sets to make them compatible with digital measure formatting.
- Clarified in the Hybrid Specification that immunizations documented under a generic header of "meningococcal conjugate vaccine" or "meningococcal polysaccharide vaccine" meet criteria.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of adolescents 13 years of age who had one dose of meningococcal vaccine, one tetanus, diphtheria toxoids and acellular pertussis (Tdap) vaccine, and have completed the human papillomavirus (HPV) vaccine series by their 13th birthday. The measure calculates a rate for each vaccine and two combination rates.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines	Commercial, Medicaid (report each product line separately).
Age	Adolescents who turn 13 years of age during the measurement year.
Continuous enrollment	12 months prior to the member's 13th birthday.
Allowable gap	No more than one gap in enrollment of up to 45 days during the 12 months prior to the 13th birthday. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not continuously enrolled).
Anchor date	Enrolled on the member's 13th birthday.
Benefit	Medical.
Event/diagnosis	None.

Administrative Specification

Denominator	The eligible population.
Numerators	For meningococcal, Tdap and HPV count *only* evidence of the antigen or combination vaccine.
Meningococcal serogroups A, C, W, Y	At least one meningococcal serogroups A, C, W, Y vaccine (Meningococcal Immunization Value Set; Meningococcal Vaccine Procedure Value Set), with a date of service on or between the member's 11th and 13th birthdays.

Tdap At least one tetanus, diphtheria toxoids and acellular pertussis (Tdap) vaccine (Tdap Immunization Value Set; Tdap Vaccine Procedure Value Set), with a date of service on or between the member's 10th and 13th birthdays.

HPV

- At least two HPV vaccines (HPV Immunization Value Set; HPV Vaccine Procedure Value Set), with dates of service at least 146 days apart on or between the member's 9th and 13th birthdays. For example, if the service date for the first vaccine was March 1, then the service date for the second vaccine must be after July 25.

OR

- At least three HPV vaccines (HPV Immunization Value Set; HPV Vaccine Procedure Value Set), with different dates of service on or between the member's 9th and 13th birthdays.

Combination 1 (Meningococcal, Tdap) Adolescents who are numerator compliant for both the meningococcal and Tdap indicators.

Combination 2 (Meningococcal, Tdap, HPV) Adolescents who are numerator compliant for all three indicators (meningococcal, Tdap, HPV).

Exclusion *(optional)*

Exclude adolescents who had a contraindication for a specific vaccine from the denominator for all antigen rates and the combination rates. The denominator for all rates must be the same. Contraindicated adolescents may be excluded only if administrative data do not indicate that the contraindicated immunization was rendered.

Any of the following meet optional exclusion criteria:

Any particular vaccine

- Anaphylactic reaction to the vaccine or its components (Anaphylactic Reaction Due To Vaccination Value Set) any time on or before the member's 13th birthday.
- Anaphylactic reaction to the vaccine or its components (Anaphylactic Reaction Due To Serum Value Set), with a date of service prior to October 1, 2011.

Tdap

- Encephalopathy (Encephalopathy Due To Vaccination Value Set) with a vaccine adverse-effect code (Vaccine Causing Adverse Effect Value Set) anytime on or before the member's 13th birthday.

Hybrid Specification

Denominator A systematic sample drawn from the eligible population for each product line. Organizations may reduce the sample size using current year's administrative rate or prior year's audited, product line-specific rate for the lowest rate across all antigens and combinations. For information on reducing the sample size, refer to the *Guidelines for Calculations and Sampling.*

Numerators For meningococcal, Tdap and HPV, count *only* the evidence of the antigen or combination vaccine.

Administrative Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record For immunization information obtained from the medical record, count members where there is evidence that the antigen was rendered from either of the following:

- A note indicating the name of the specific antigen and the date of the immunization.
- A certificate of immunization prepared by an authorized health care provider or agency, including the specific dates and types of immunizations administered.

For the two-dose HPV vaccination series, there must be at least 146 days between the first and second dose of the HPV vaccine.

For meningococcal, *do not count* meningococcal recombinant (serogroup B) (MenB) vaccines. Immunizations documented under a generic header of "meningococcal" and generic documentation that "meningococcal vaccine," "meningococcal conjugate vaccine" or "meningococcal polysaccharide vaccine" were administered meet criteria.

Immunizations documented using a generic header of "Tdap/Td" can be counted as evidence of Tdap. The burden on organizations to substantiate the Tdap antigen is excessive compared to a risk associated with data integrity.

Exclusion *(optional)*

Refer to *Administrative Specification* for exclusion criteria. The exclusion must have occurred on or before the member's 13th birthday.

Note

- *To align with Advisory Committee On Immunization Practices (ACIP) recommendations, only the quadrivalent meningococcal vaccine (serogroups A, C, W and Y) is included in the measure.*
- *To align with ACIP recommendations, the minimum interval for the two-dose HPV vaccination schedule is 150 days (5 months), with a 4-day grace period (146 days).*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table IMA-1/2: Data Elements for Immunizations for Adolescents

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (administrative or hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		*Each of the 5 rates*
Current year's administrative rate (before exclusions)		*Each of the 5 rates*
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		*Each of the 5 rates*
Administrative rate on MRSS		*Each of the 5 rates*
Number of medical records excluded because of valid data errors		✓
Number of administrative data records excluded		✓
Number of medical record data records excluded		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	*Each of the 5 rates*	*Each of the 5 rates*
Numerator events by medical records		*Each of the 5 rates*
Numerator events by supplemental data	*Each of the 5 rates*	*Each of the 5 rates*
Reported rate	*Each of the 5 rates*	*Each of the 5 rates*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Immunizations for Adolescents

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age 13 as of June 30"). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefit	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	NA	There is no event/diagnosis for this measure.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• Meningococcal • Tdap • HPV	No	Value sets and logic may not be changed. Vaccine dose requirements may not be changed.
• Combination Rates	Yes, with limits	Organizations are not required to calculate combination rates; alternate combinations of specified immunizations are allowed.

Initiation and Engagement of Alcohol and Other Drug Abuse or Dependence Treatment (IET)

SUMMARY OF CHANGES TO HEDIS 2020

- Revised the Intake Period to end on November 13 of the measurement year.
- Removed "with or without a telehealth modifier" language; refer to *General Guideline 43*.
- Clarified that the diagnosis must be on the discharge claim when identifying acute and nonacute inpatient discharges.
- Renamed the medication lists.
- Added "Buprenorphine injections" to the Opioid Use Disorder Treatment Medications List.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of adolescent and adult members with a new episode of alcohol or other drug (AOD) abuse or dependence who received the following.

- *Initiation of AOD Treatment.* The percentage of members who initiate treatment through an inpatient AOD admission, outpatient visit, intensive outpatient encounter or partial hospitalization, telehealth or medication treatment within 14 days of the diagnosis.
- *Engagement of AOD Treatment.* The percentage of members who initiated treatment and who were engaged in ongoing AOD treatment within 34 days of the initiation visit.

Definitions

Intake Period — January 1–November 13 of the measurement year. The Intake Period is used to capture new episodes of AOD abuse and dependence.

Index Episode — The earliest eligible encounter during the Intake Period with a diagnosis of AOD abuse or dependence. *For ED visits that result in an inpatient stay*, the inpatient discharge is the Index Episode.

IESD — Index Episode Start Date. The earliest date of service for an eligible encounter during the Intake Period with a diagnosis of AOD abuse or dependence.

For an outpatient, intensive outpatient, partial hospitalization, observation, telehealth, detoxification or ED visit (not resulting in an inpatient stay), the IESD is the date of service.

For an inpatient stay, the IESD is the date of discharge.

For an ED and observation visits that results in an inpatient stay, the IESD is the date of the inpatient discharge (an AOD diagnosis is not required for the inpatient stay; use the diagnosis from the ED or observation visit to determine the diagnosis cohort).

For direct transfers, the IESD is the discharge date from the last admission (an AOD diagnosis is not required for the transfer; use the diagnosis from the initial admission to determine the diagnosis cohort).

Negative Diagnosis History

A period of 60 days (2 months) before the IESD when the member had no claims/encounters with a diagnosis of AOD abuse or dependence.

For an inpatient stay, use the admission date to determine the Negative Diagnosis History.

For ED or observation visits that result in an inpatient stay, use the earliest date of service (either the ED/observation date of service or the inpatient admission date) to determine the Negative Diagnosis History.

For direct transfers, use the first admission to determine the Negative Diagnosis History.

Direct transfer

A direct transfer is when the discharge date from the first inpatient setting precedes the admission date to a second inpatient setting by one calendar day or less. For example:

- An inpatient discharge on June 1, followed by an admission to another inpatient setting on June 1, is a direct transfer.
- An inpatient discharge on June 1, followed by an admission to an inpatient setting on June 2, is a direct transfer.
- An inpatient discharge on June 1, followed by an admission to another inpatient setting on June 3, is not a direct transfer; these are two distinct inpatient stays.

Use the following method to identify admissions to and discharges from inpatient settings.

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission and discharge dates for the stay.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product lines

Commercial, Medicaid, Medicare (report each product line separately).

Age

13 years and older as of December 31 of the measurement year. Report two age stratifications and a total rate.

- 13–17 years.
- 18+ years.
- Total.

The total is the sum of the age stratifications.

AOD diagnosis cohorts

Report the following diagnosis cohorts for each age stratification and the total rate:

- Alcohol abuse or dependence.
- Opioid abuse or dependence.
- Other drug abuse or dependence.
- Total.

Continuous enrollment 60 days (2 months) prior to the IESD through 48 days after the IESD (109 total days).

Allowable gap None.

Anchor date None.

Benefits Medical, pharmacy and chemical dependency (inpatient and outpatient).

Note: *Members with detoxification-only chemical dependency benefits do not meet these criteria.*

Event/diagnosis New episode of AOD abuse or dependence during the Intake Period.

Follow the steps below to identify the eligible population, which is the denominator for both rates.

Step 1 Identify the Index Episode. Identify all members in the specified age range who during the Intake Period had one of the following:

- An outpatient visit, telehealth, intensive outpatient visit or partial hospitalization with a diagnosis of AOD abuse or dependence. Any of the following code combinations meet criteria:
  - IET Stand Alone Visits Value Set ***with*** one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
  - IET Visits Group 1 Value Set ***with*** IET POS Group 1 Value Set and with one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
  - IET Visits Group 2 Value Set ***with*** IET POS Group 2 Value Set and ***with*** one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- A detoxification visit (Detoxification Value Set) ***with*** one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- An ED visit (ED Value Set) ***with*** one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- An observation visit (Observation Value Set) ***with*** one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- An acute or nonacute inpatient discharge ***with*** one of the following on the discharge claim: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set. To identify acute and nonacute inpatient discharges:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Identify the discharge date for the stay.
- A telephone visit (Telephone Visits Value Set) ***with*** one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.

- An online assessment (Online Assessments Value Set) ***with*** one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.

For members with more than one episode of AOD abuse or dependence, use the first episode.

For members whose first episode was an ED or observation visit that resulted in an inpatient stay, use the diagnosis from the ED or observation visit to determine the diagnosis cohort and use the inpatient discharge date as the IESD.

Step 2 Select the Index Episode and stratify based on age and AOD diagnosis cohort.

- If the member has a diagnosis of alcohol abuse or dependence (Alcohol Abuse and Dependence Value Set), place the member in the alcohol cohort.
- If the member has a diagnosis of opioid abuse of dependence (Opioid Abuse and Dependence Value Set), place the member in the opioid cohort.
- If the member has a drug abuse or dependence that is neither for opioid or alcohol (Other Drug Abuse and Dependence Value Set), place the member in the other drug cohort.

If the member has multiple substance use diagnosis for the visit, report the member in all AOD diagnosis stratifications for which they meet criteria.

The total is not a sum of the diagnosis cohorts. Count members in the total denominator rate if they had at least one alcohol, opioid or other drug abuse or dependence diagnosis during the measurement period. Report member with multiple diagnoses during the Index Episode only once for the total rate for the denominator.

Step 3 Test for Negative Diagnosis History. Exclude members who had a claim/ encounter with a diagnosis of AOD abuse or dependence (AOD Abuse and Dependence Value Set), AOD medication treatment (AOD Medication Treatment Value Set) or an alcohol or opioid dependency treatment medication dispensing event (Alcohol Use Disorder Treatment Medications List; Opioid Use Disorder Treatment Medications List) during the 60 days (2 months) before the IESD.

For an inpatient IESD, use the admission date to determine the 60-day Negative Diagnosis History period.

For an ED or observation visit that results in an inpatient stay, use the ED/ observation date of service to determine the 60-day Negative Diagnosis History period.

Step 4 Calculate continuous enrollment. Members must be continuously enrolled for 60 days (2 months) before the IESD through 48 days after the IESD (109 total days), with no gaps.

Administrative Specification

Denominator The eligible population.

Numerator

Initiation of AOD Treatment Initiation of AOD treatment within 14 days of the IESD.

If the Index Episode was an inpatient discharge (or an ED/observation visit that resulted in an inpatient stay), the inpatient stay is considered initiation of treatment and the member is compliant.

If the Index Episode was not an inpatient discharge, the member must initiate treatment on the IESD or in the 13 days after the IESD (14 total days). Any of the following code combinations meet criteria for initiation:

- An acute or nonacute inpatient admission ***with*** a diagnosis (on the discharge claim) matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set. To identify acute and nonacute inpatient admissions:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Identify the admission date for the stay.
- IET Stand Alone Visits Value Set ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- Observation Value Set ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- IET Visits Group 1 Value Set ***with*** IET POS Group 1 Value Set ***and*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- IET Visits Group 2 Value Set ***with*** IET POS Group 2 Value Set ***and*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- A telephone visit (Telephone Visit Value Set) ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- An online assessment (Online Assessment Value Set) set ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- If the Index Episode was for a diagnosis of alcohol abuse or dependence (Alcohol Abuse and Dependence Value Set) a medication treatment dispensing event (Alcohol Use Disorder Treatment Medications List) or

medication treatment during a visit (AOD Medication Treatment Value Set).

- If the Index Episode was for a diagnosis of opioid abuse or dependence (Opioid Abuse and Dependence Value Set) a medication treatment dispensing event (Opioid Use Disorder Treatment Medications List) or medication treatment during a visit (AOD Medication Treatment Value Set).

For all initiation events except medication treatment (AOD Medication Treatment Value Set; Alcohol Use Disorder Treatment Medications List; Alcohol Use Disorder Treatment Medications List), initiation on the same day as the IESD must be with different providers in order to count.

If a member is compliant for the Initiation numerator for any diagnosis cohort (i.e., alcohol, opioid, other drug) or for multiple cohorts, count the member only once in the Total Initiation numerator. The "Total" column is not the sum of the diagnosis columns.

Exclude the member from the denominator for both indicators *(Initiation of AOD Treatment* and *Engagement of AOD Treatment)* if the initiation of treatment event is an inpatient stay with a discharge date after November 27 of the measurement year.

Engagement of AOD Treatment

Step 1 Identify all members compliant for the Initiation of AOD Treatment numerator.

For members who initiated treatment via an inpatient admission, the 34-day period for the two engagement visits begins the day after discharge.

Step 2 Identify members whose initiation of AOD treatment was a medication treatment event (Alcohol Use Disorder Treatment Medications List; Opioid Use Disorder Treatment Medications List; AOD Medication Treatment Value Set).

These members are numerator compliant if they have two or more engagement events, where only one can be an engagement medication treatment event, beginning on the day after the initiation encounter through 34 days after the initiation event (total of 34 days).

Step 3 Identify the remaining members whose initiation of AOD treatment was *not* a medication treatment event (members not identified in step 2).

These members are numerator compliant if they meet *either* of the following:

- At least one engagement medication treatment event.
- At least two engagement visits.

Two engagement visits can be on the same date of service but they must be with different providers in order to count as two events. An engagement visit on the same date of service as an engagement medication treatment event meets criteria (there is no requirement that they be with different providers).

Refer to the descriptions below to identify engagement visits and engagement medication treatment events.

Engagement visits

Any of the following beginning on the day after the initiation encounter through 34 days after the initiation event (total of 34 days) meet criteria for an engagement visit:

- An acute or nonacute inpatient admission with a diagnosis (on the discharge claim) matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set. To identify acute or nonacute inpatient admissions:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Identify the admission date for the stay.
- IET Stand Alone Visits Value Set ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- Observation Value Set ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- IET Visits Group 1 Value Set ***with*** IET POS Group 1 Value Set ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- IET Visits Group 2 Value Set ***with*** IET POS Group 2 Value Set ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- A telephone visit (Telephone Visits Value Set) ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.
- An online assessment (Online Assessments Value Set) ***with*** a diagnosis matching the IESD diagnosis cohort using one of the following: Alcohol Abuse and Dependence Value Set, Opioid Abuse and Dependence Value Set, Other Drug Abuse and Dependence Value Set.

Engagement medication treatment events

Either of the following meets criteria for an engagement medication treatment event:

- If the IESD diagnosis was *a diagnosis of alcohol abuse or dependence* (Alcohol Abuse and Dependence Value Set), one or more medication treatment dispensing events (Alcohol Use Disorder Treatment Medications List) or medication treatment during a visit (AOD Medication Treatment Value Set), beginning on the day after the initiation encounter through 34 days after the initiation event (total of 34 days), meets criteria for Alcohol Abuse and Dependence Treatment.
- If the IESD diagnosis was *a diagnosis of opioid abuse or dependence* (Opioid Abuse and Dependence Value Set), one or more medication dispensing events (Opioid Use Disorder Treatment Medications List) or medication treatment during a visit (AOD Medication Treatment Value

Set), beginning on the day after the initiation encounter through 34 days after the initiation event (total of 34 days), meets criteria for *Opioid Abuse and Dependence Treatment.*

If the member is compliant for multiple cohorts, only count the member once for the Total Engagement numerator. The Total Column is not the sum of the diagnosis columns.

Alcohol Use Disorder Treatment Medications

Description	Prescription
Aldehyde dehydrogenase inhibitor	• Disulfiram (oral)
Antagonist	• Naltrexone (oral and injectable)
Other	• Acamprosate (oral; delayed-release tablet)

Opioid Use Disorder Treatment Medications

Description	Prescription
Antagonist	• Naltrexone (oral and injectable)
Partial agonist	• Buprenorphine (sublingual tablet, injection, implant) • Buprenorphine/naloxone (sublingual tablet, buccal film, sublingual film)

Note

- *Organizations may have different methods for billing intensive outpatient encounters and partial hospitalizations. Some organizations may bill comparable to outpatient billing, with separate claims for each date of service; others may bill comparable to inpatient billing, with an admission date, a discharge date and units of service. Organizations whose billing is comparable to inpatient billing may count each unit of service as an individual visit. The unit of service must have occurred during the required time frame for the rate.*
- *For members in the "other drug abuse or dependence" cohort, medication treatment does not meet numerator criteria for* Initiation of AOD Treatment *or* Engagement of AOD Treatment*.*
- *Methadone is not included in the medication lists for this measure. Methadone for opioid use disorder is only administered or dispensed by federally certified opioid treatment programs and does not show up in pharmacy claims data. A pharmacy claim for methadone would be more indicative of treatment for pain than treatment for an opioid use disorder; therefore they are not included in the medication lists. The AOD Medication Treatment Value Set includes some codes that identify methadone treatment because these codes are used on medical claims, not pharmacy claims.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table IET-1/2/3: Data Elements for Initiation and Engagement of Alcohol and Other Drug Dependence Treatment

	Administrative
Measurement year	✓
Data collection methodology (administrative)	✓
Eligible population	*For each age stratification, diagnosis stratification and total*
Numerator events by administrative data	*Each rate, for each age stratification, diagnosis stratification and total*
Reported rate	*Each rate, for each age stratification, diagnosis stratification and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Initiation and Engagement of Alcohol and Other Drug Dependence Treatment

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes	The age determination dates may be changed (e.g., select, "age as of June 30"). Changing the denominator age range is allowed.
AOD diagnosis cohorts	Yes, with limits	Reporting each stratum or combined strata is allowed.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	Yes, with limits	Only events that contain (or map to) codes in the medication lists and value sets may be used to identify visits. Medication lists and value sets and logic may not be changed. ***Note:*** *This measure uses new episodes of AOD abuse and dependence; modifying the Intake period can affect the Index Episode and other dates; however, the order and relationship of the events may not be changed.*
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Exclusions	NA	There are no exclusions for this measure.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• Initiation of AOD Treatment • Engagement of AOD Treatment	No	Medication lists, value sets and logic may not be changed.

Inpatient Utilization—General Hospital/Acute Care (IPU)

SUMMARY OF CHANGES TO HEDIS 2020

- Retired the Medicare and Commercial product lines.
- Clarified in step 2 to use the diagnosis on the discharge claim.
- Added a *Note* section.
- Added shading to the Data Elements for Reporting tables to indicate how data are reported.
- Added the *Rules for Allowable Adjustments of HEDIS* section

Description

This measure summarizes utilization of acute inpatient care and services in the following categories:

- Maternity.
- Surgery.
- Medicine.
- Total inpatient (the sum of Maternity, Surgery and Medicine).

Calculations

Note: *Members in hospice are excluded from this measure. Refer to General Guideline 17: Members in Hospice.*

Product lines Report the following tables for the Medicaid product line:

- Table IPU-1a Total Medicaid.
- Table IPU-1b Medicaid/Medicare Dual-Eligibles.
- Table IPU-1c Medicaid—Disabled.
- Table IPU-1d Medicaid—Other Low Income.

Member months For each table, report all member months for the measurement year.. Refer to *Specific Instructions for Utilization Tables* for more information.

Maternity rates are reported per 1,000 male and per 1,000 female total member months for members 10–64 years in order to capture deliveries as a percentage of the total inpatient discharges.

Days Count all days associated with the identified discharges. Report days for total inpatient, maternity, surgery and medicine.

ALOS Refer to *Specific Instructions for Utilization Tables* for the formula. Calculate average length of stay for total inpatient, maternity, surgery and medicine.

Use the following steps to identify and categorize inpatient discharges.

Step 1 Identify all acute inpatient discharges on or between January 1 and December 31 of the measurement year. To identify acute inpatient discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the discharge date for the stay.

Step 2 Exclude discharges with a principal diagnosis of mental health or chemical dependency (Mental and Behavioral Disorders Value Set) on the discharge claim.

Exclude newborn care rendered from birth to discharge home from delivery (only include care rendered during subsequent rehospitalizations after the delivery discharge). Identify newborn care by a principal diagnosis of live-born infant (Deliveries Infant Record Value Set). Organizations must develop methods to differentiate between the mother's claim and the newborn's claim, if needed.

Step 3 Report total inpatient, using all discharges identified after completing steps 1 and 2.

Step 4 Report maternity. A delivery is not required for inclusion in the *Maternity* category; any maternity-related stay is included. Include birthing center deliveries and count them as one day of stay.

Starting with all discharges identified in step 3, identify maternity using either of the following:

- A maternity-related principal diagnosis (Maternity Diagnosis Value Set).
- A maternity-related stay (Maternity Value Set).

Step 5 Report surgery. From discharges remaining after removing maternity (identified in step 4) from total inpatient (identified in step 3), identify surgery (Surgery Value Set).

Step 6 Report medicine. Categorize as medicine the discharges remaining after removing maternity (identified in step 4) and surgery (identified in step 5) from total inpatient (identified in step 3).

Note

- *Supplemental data may not be used for this measure.*

Table IPU-1: Inpatient Utilization—General Hospital/Acute Care

Age	Member Months
<1	
1-9	
10-19	
20-44	
45-64	
65-74	
75-84	
85+	
Unknown	
Total	

Age	Discharges	Discharges/1,000 Member Months	Days	Days/1,000 Member Months	Average Length of Stay
Total Inpatient					
<1					
1-9					
10-19					
20-44					
45-64					
65-74					
75-84					
85+					
Unknown					
Total					
Maternity*					
10-19					
20-44					
45-64					
Unknown					
Total					
Surgery					
<1					
1-9					
10-19					
20-44					
45-64					
65-74					
75-84					
85+					
Unknown					
Total					

*****The *Maternity* category is calculated using member months for members 10–64 years.

Age	Discharges	Discharges/1,000 Member Months	Days	Days/1,000 Member Months	Average Length of Stay
Medicine					
<1					
1-9					
10-19					
20-44					
45-64					
65-74					
75-84					
85+					
Unknown					
Total					

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Inpatient Utilization—General Hospital/Acute Care

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	NA	There are no ages specified in this measure. Organizations can choose whether to apply age band criteria.
Continuous enrollment, Allowable gap, Anchor Date	NA	There are no continuous enrollment, Allowable gap or Anchor date requirements for this measure. Organizations are not required to calculate member months.
Benefits	No	There are no required benefits for this measure.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	NA	There is no event/diagnosis for this measure.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Exclusions	NA	There are no exclusions for this measure.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Inpatient Services	No	Value sets and logic may not be changed.

Lead Screening in Children (LSC)

SUMMARY OF CHANGES TO HEDIS 2020

- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of children 2 years of age who had one or more capillary or venous lead blood test for lead poisoning by their second birthday.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product line	Medicaid.
Age	Children who turn 2 years old during the measurement year.
Continuous enrollment	12 months prior to the child's second birthday.
Allowable gap	No more than one gap in enrollment of up to 45 days during the 12 months prior to the child's second birthday. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
Anchor date	Enrolled on the child's second birthday.
Benefit	Medical.
Event/diagnosis	None.

Administrative Specification

Denominator	The eligible population.
Numerator	At least one lead capillary or venous blood test (Lead Tests Value Set) on or before the child's second birthday.

Hybrid Specification

Denominator

A systematic sample drawn from the eligible population.

Organizations that use the Hybrid Method to report the *Childhood Immunization Status* and *Lead Screening in Children* measures may use the same sample for both measures. If an organization applies optional exclusions to the CIS measure and uses the CIS systematic sample, the same children will be excluded from the LSC measure. Excluding these members will not create a statistically significant difference in the LSC eligible population.

Organizations may reduce the sample size based on the current year's administrative rate or prior year's audited, product line-specific rate for the lowest rate of all CIS antigens, CIS combinations and LSC rate.

If a separate sample from the CIS measure is used for LSC, organizations may reduce the sample based on the product line-specific current measurement year's administrative rate or the prior year's audited, product line-specific rate for LSC.

Numerator

At least one lead capillary or venous blood test on or before the child's second birthday as documented through either administrative data or medical record review.

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record

Documentation in the medical record must include both of the following:

- A note indicating the date the test was performed.
- The result or finding.

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table LSC-1: Data Elements for Lead Screening in Children

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		✓
Current year's administrative rate (before exclusions)		✓
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		✓
Administrative rate on MRSS		✓
Number of medical records excluded because of valid data errors		✓
Number of administrative records excluded		✓
Number of medical records excluded		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	✓	✓
Numerator events by medical records		✓
Numerator events by supplemental data	✓	✓
Reported rate	✓	✓

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Lead Screening in Children

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age 2 as of June 30"). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefit	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	NA	There is no event/diagnosis for this measure.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	NA	There are no exclusions for this measure.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Lead capillary or venous blood test	No	Value sets and logic may not be changed.

eCQM Title	**Maternal Depression Screening**		
eCQM Identifier (Measure Authoring Tool)	82	**eCQM Version number**	7.1.000
NQF Number	Not Applicable	**GUID**	8e6c8479-99fd-4949-b0ad-24fa60fe4201
Measurement Period	January 1, 20XX through December 31, 20XX		
Measure Steward	National Committee for Quality Assurance		
Measure Developer	National Committee for Quality Assurance		
Endorsed By	None		
Description	The percentage of children who turned 6 months of age during the measurement year, who had a face-to-face visit between the clinician and the child during child's first 6 months, and who had a maternal depression screening for the mother at least once between 0 and 6 months of life		
Copyright	This Physician Performance Measure (Measure) and related data specifications were developed by the National Committee for Quality Assurance (NCQA) with support from The Commonwealth Fund, a national, private foundation based in New York City that supports independent research on health care issues and makes grants to improve health care practice and policy. The views presented here are those of the author and not necessarily those of The Commonwealth Fund, its directors, officers, or staff. The Measure can be reproduced and distributed, without modification, for noncommercial purposes (e.g., use by healthcare providers in connection with their practices) without obtaining approval from NCQA. Commercial use is defined as the sale, licensing, or distribution of the Measure for commercial gain, or incorporation of the Measure into a product or service that is sold, licensed or distributed for commercial gain. All commercial uses must be approved by NCQA and are subject to a license at the discretion of NCQA. NCQA is not responsible for any use of the Measure. NCQA makes no representations, warranties, or endorsement about the quality of any organization or physician that uses or reports performance measures and NCQA has no liability to anyone who relies on such measures or specifications. (C) 2009-2019 National Committee for Quality Assurance. All Rights Reserved. Limited proprietary coding is contained in the Measure specifications for user convenience. Users of proprietary code sets should obtain all necessary licenses from the owners of the code sets. NCQA disclaims all liability for use or accuracy of any third party codes contained in the specifications. CPT(R) contained in the Measure specifications is copyright 2004-2018 American Medical Association. LOINC(R) copyright 2004-2018 Regenstrief Institute, Inc. This material contains SNOMED Clinical Terms(R) (SNOMED CT[R]) copyright 2004-2018 International Health Terminology Standards Development Organisation. ICD-10 copyright 2018 World Health Organization. All Rights Reserved.		
Disclaimer	The performance Measure is not a clinical guideline and does not establish a standard of medical care, and has not been tested for all potential applications. THE MEASURE AND SPECIFICATIONS ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND. Due to technical limitations, registered trademarks are indicated by (R) or [R] and unregistered trademarks are indicated by (TM) or [TM].		
Measure Scoring	Proportion		
Measure Type	Process		
Stratification	None		
Risk Adjustment	None		
Rate Aggregation	None		
Rationale	Maternal depression is a common condition with potentially serious and far-reaching consequences. Rates of depression for pregnant and/or postpartum women range from 12-15%, with postpartum depression rates in some U.S. areas estimated to be as high as 20% (Ko et al., 2017; Gaynes et al., 2005; Bennett et al., 2004). Depression has significant consequences for women, their infants and families. Women with untreated depression during pregnancy are at risk of developing severe postpartum depression and suicidality, and of delivering premature or low birthweight babies (Chan et al., 2014). Postpartum depression hinders infant attachment and bonding and can lead to developmental disorders that last into adolescence (Field, 2010; Kingston, Tough, & Whitfield, 2012; Dawson et al., 1999). During infancy, important caregiving activities such as breastfeeding, sleep, adherence to well-child visits and vaccine schedules can be compromised in depressed mothers (Kingston et al., 2012; Gregory et al., 2015; Minkovitz et al., 2005). Clinical guidelines recommend that maternal screenings for depression should occur where there are adequate systems in place (Siu & USPSTF, 2016; American College of Obstetricians and Gynecologists, 2015; Yonkers et al., 2009). Adequate systems in place means having the appropriate systems and clinical staff to ensure that patients are screened and, if screened positive, are appropriately diagnosed and treated with evidence-based care or referred to a setting that can provide the necessary care (Siu & USPSTF, 2016). Guidelines also recommend that providers maintain regular follow-up with patients diagnosed with depression and use a standardized tool to track symptoms (Mitchell et al., 2013). Standardized instruments are useful in identifying meaningful change in clinical outcomes over time. Despite these clinical recommendations, maternal depression is often underdiagnosed and untreated. Nearly 60% of women with depressive symptoms do not receive a clinical diagnosis, and 50% of women with a diagnosis do not receive any treatment (Ko et al., 2012). This measure encourages clinicians to screen new mothers for depression.		
Clinical Recommendation Statement	U.S. Preventive Services Task Force (USPSTF) et al. (2016) The USPSTF recommends screening for depression in the general adult population, including pregnant and postpartum women. Screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up. Grade: B Recommendation Bright Futures (Hagan et al., 2017) Mothers of one month old infants: Maternal depression screen Mothers of two month old infants: Maternal depression screen Grade: Expert Consensus American College of Obstetricians and Gynecologists (2015) The American College of Obstetricians and Gynecologists recommends that clinicians screen patients at least once during the perinatal period for depression and anxiety symptoms using a standardized, validated tool. Although screening is important for detecting perinatal depression, screening by itself is insufficient to improve clinical outcomes and must be coupled with appropriate follow-up and treatment when indicated. Systems should be in place to ensure follow-up for diagnosis and treatment. Grade: Expert Consensus		
Improvement Notation	Higher score indicates better quality		
Reference	.American College of Obstetrics and Gynecologists. (2015). Screening for perinatal depression: Committee Opinion No. 630. Obstetrics & Gynecology, 125(5), 1268-1271.		
Reference	Bennett, H. A., Einarson, A., Taddio, A., et al. (2004, April). Prevalence of depression during pregnancy: systematic review. Obstetrics & Gynecology, 103(4), 698-709.		

Reference	Chan, J., Natekar, A., Einarson, A., et al. and Koren G. (2014, March). Risks of untreated depression in pregnancy. Canadian Family Physician,. 2014 Mar; 60(3),: 242-243.
Reference	Dawson, G., Frey, K., Panagiotides, H., et al. (1999). Infants of depressed mothers exhibit atypical frontal electrical brain activity during interactions with mother and with a familiar, nondepressed adult. Child Development, 70(5), 1058-1066.
Reference	Field, T. (2010). Postpartum depression effects on early interactions, parenting, and safety practices: A review. Infant Behavior and Development. 2010;, 33(1), :1-6.
Reference	Gaynes, B. N., Gavin, N., Meltzer-Brody, S., et al. (2005, February). Perinatal depression: Prevalence, screening accuracy, and screening outcomes—Summary (Evidence Report/Technology Assessment No. 119; AHRQ Publication No. 05-E006-1). Rockville, MD: Agency for Healthcare Research and Quality.
Reference	Gregory, E. F., Butz, A. M., Ghazarian, S. R., et al. (2015). Are unmet breastfeeding expectations associated with maternal depressive symptoms? Academic Pediatrics, 15(3), 319-325.
Reference	Hagan, J. F., Shaw, J. S., Duncan, P. M. (eds.). (2017). Bright Futures: Guidelines for health supervision of infants, children, and adolescents. 4th edition. Elk Grove, IL: American Academy of Pediatrics.
Reference	Kingston, D., Tough, S., & Whitfield, H. (2012). Prenatal and postpartum maternal psychological distress and infant development: A systematic review. Child Psychiatry & Human Development. 2012, ;43(5), :683-714.
Reference	Ko, J. Y., Farr, S. L., Dietz, P. M., et al. (2012). Depression and treatment among U.S. pregnant and nonpregnant women of reproductive age, 2005-2009. Journal of Women's Health (Larchmont), 21(8), 830-836.
Reference	Ko, J. Y., Rockhill, K. M., Tong, V. T., et al. (2017). Trends in postpartum depressive symptoms—27 states, 2004, 2008, and 2012. Morbidity and Mortality Weekly Report, 66(6), 153-158. doi: http://dx.doi.org/10.15585/mmwr.mm6606a1
Reference	Minkovitz, C. S., Strobino, D., Scharfstein, D., et al. (2005). Maternal depressive symptoms and children's receipt of health care in the first 3 years of life. Pediatrics, 115(2), 306-314.
Reference	Mitchell, J., Trangle, M., Degnan, B., et al. (2013, September). Adult depression in primary care. Bloomington, MN: Institute for Clinical Systems Improvement.
Reference	Siu, A. L., & USPSTF. (2016). Screening for depression in adults: U.S. Preventive Services Task Force recommendation statement. JAMA, 315(4), 380-387.
Reference	US Preventive Services Task Force, Siu, A. L., Bibbins-Domingo, K., et al. (2016, January 26). Screening for depression in adults: U.S. Preventive Services Task Force recommendation statement. JAMA, 315(4), 380-387. doi: 10.1001/jama.2015.18392
Reference	Yonkers, K. A., Wisner, K. L., Stewart, D. E., et al. (2009). The management of depression during pregnancy: A report from the American Psychiatric Association and the American College of Obstetricians and Gynecologists. General Hospital Psychiatry, 31(5), 403-413.
Definition	None
Guidance	The eMeasure specifies only patient's (baby) chart, looking for the newly allocated SNOMED codes that allow providers to record the screening and treatment of the mother, but the endorsed measure relies on notes from the patient's and mother's charts. Information for the measure can be obtained from either the mother's or the baby's chart.
Transmission Format	TBD
Initial Population	Children with a visit who turned 6 months of age in the measurement period
Denominator	Equals Initial Population
Denominator Exclusions	None
Numerator	Children with documentation of maternal screening or treatment for postpartum depression for the mother
Numerator Exclusions	Not Applicable
Denominator Exceptions	None
Supplemental Data Elements	For every patient evaluated by this measure also identify payer, race, ethnicity and sex

Table of Contents

Population Criteria

Initial Population

```
exists "Qualifying Encounters Before 6 Months of Age"
      and exists "Turns 6 Months of Age During Measurement Period"
```

Denominator

```
"Initial Population"
```

Denominator Exclusions

None

Numerator

```
exists ( ( ["Intervention, Performed": "Maternal postpartum depression care (regime/therapy)"]
            union ["Assessment, Performed": "Maternal postpartum depression screening (procedure)"] ) DepressionScreening
            with ["Patient Characteristic Birthdate": "Birth date"] BirthDate
                  such that Global."CalendarAgeInMonthsAt"(BirthDate.birthDatetime, DepressionScreening.authorDatetime)<= 6
)
```

Numerator Exclusions

None

Denominator Exceptions

None

Stratification

None

Definitions

Denominator

"Initial Population"

Initial Population

```
exists "Qualifying Encounters Before 6 Months of Age"
    and exists "Turns 6 Months of Age During Measurement Period"
```

Numerator

```
exists ( ( ["Intervention, Performed": "Maternal postpartum depression care (regime/therapy)"]
        union ["Assessment, Performed": "Maternal postpartum depression screening (procedure)"] ) DepressionScreening
        with ["Patient Characteristic Birthdate": "Birth date"] BirthDate
            such that Global."CalendarAgeInMonthsAt"(BirthDate.birthDatetime, DepressionScreening.authorDatetime)<= 6
)
```

Qualifying Encounters

```
( ["Encounter, Performed": "Office Visit"]
        union ["Encounter, Performed": "Preventive Care - Established Office Visit, 0 to 17"]
        union ["Encounter, Performed": "Preventive Care - Initial Office Visit, 0 to 17"]
)
```

Qualifying Encounters Before 6 Months of Age

```
"Qualifying Encounters" ValidEncounters
    with ["Patient Characteristic Birthdate": "Birth date"] BirthDate
        such that Global."CalendarAgeInMonthsAt"(BirthDate.birthDatetime, start of ValidEncounters.relevantPeriod)<= 6
```

SDE Ethnicity

```
["Patient Characteristic Ethnicity": "Ethnicity"]
```

SDE Payer

```
["Patient Characteristic Payer": "Payer"]
```

SDE Race

```
["Patient Characteristic Race": "Race"]
```

SDE Sex

```
["Patient Characteristic Sex": "ONC Administrative Sex"]
```

Turns 6 Months of Age During Measurement Period

```
["Patient Characteristic Birthdate": "Birth date"] BirthDate
    where Global."CalendarAgeInMonthsAt"(BirthDate.birthDatetime, start of "Measurement Period")< 6
        and Global."CalendarAgeInMonthsAt"(BirthDate.birthDatetime,
            end of "Measurement Period"
        )>= 6
```

Functions

Global.CalendarAgeInMonthsAt(BirthDateTime DateTime, AsOf DateTime)

```
months between ToDate(BirthDateTime)and ToDate(AsOf)
```

Global.ToDate(Value DateTime)

```
DateTime(year from Value, month from Value, day from Value, 0, 0, 0, 0, timezone from Value)
```

Terminology

- code "Birth date" ("LOINC Code (21112-8)")
- code "Maternal postpartum depression care (regime/therapy)" ("SNOMEDCT Code (428231000124106)")
- code "Maternal postpartum depression screening (procedure)" ("SNOMEDCT Code (428221000124108)")
- valueset "Ethnicity" (2.16.840.1.114222.4.11.837)
- valueset "Office Visit" (2.16.840.1.113883.3.464.1003.101.12.1001)
- valueset "ONC Administrative Sex" (2.16.840.1.113762.1.4.1)
- valueset "Payer" (2.16.840.1.114222.4.11.3591)
- valueset "Preventive Care - Established Office Visit, 0 to 17" (2.16.840.1.113883.3.464.1003.101.11.1120)
- valueset "Preventive Care - Initial Office Visit, 0 to 17" (2.16.840.1.113883.3.464.1003.101.11.1110)
- valueset "Race" (2.16.840.1.114222.4.11.836)

Data Criteria (QDM Data Elements)

- "Encounter, Performed: Office Visit" using "Office Visit (2.16.840.1.113883.3.464.1003.101.12.1001)"
- "Encounter, Performed: Preventive Care - Established Office Visit, 0 to 17" using "Preventive Care - Established Office Visit, 0 to 17 (2.16.840.1.113883.3.464.1003.101.11.1120)"
- "Encounter, Performed: Preventive Care - Initial Office Visit, 0 to 17" using "Preventive Care - Initial Office Visit, 0 to 17 (2.16.840.1.113883.3.464.1003.101.11.1110)"
- "Patient Characteristic Ethnicity: Ethnicity" using "Ethnicity (2.16.840.1.114222.4.11.837)"
- "Patient Characteristic Payer: Payer" using "Payer (2.16.840.1.114222.4.11.3591)"
- "Patient Characteristic Race: Race" using "Race (2.16.840.1.114222.4.11.836)"
- "Patient Characteristic Sex: ONC Administrative Sex" using "ONC Administrative Sex (2.16.840.1.113762.1.4.1)"
- "Assessment, Performed: Maternal postpartum depression screening (procedure)" using "Maternal postpartum depression screening (procedure) (SNOMEDCT Code 428221000124108)"
- "Intervention, Performed: Maternal postpartum depression care (regime/therapy)" using "Maternal postpartum depression care (regime/therapy) (SNOMEDCT Code 428231000124106)"
- "Patient Characteristic Birthdate: Birth date" using "Birth date (LOINC Code 21112-8)"

Supplemental Data Elements

SDE Ethnicity

["Patient Characteristic Ethnicity": "Ethnicity"]

SDE Payer

["Patient Characteristic Payer": "Payer"]

SDE Race

["Patient Characteristic Race": "Race"]

SDE Sex

["Patient Characteristic Sex": "ONC Administrative Sex"]

Risk Adjustment Variables

None

Measure Set	None

Medical Assistance With Smoking and Tobacco Use Cessation (MSC)

SUMMARY OF CHANGES TO HEDIS 2020

- This measure is collected using survey methodology. Detailed specifications and summary of changes are contained in *HEDIS 2020, Volume 3: Specifications for Survey Measures.*

Description

The three components of this measure assess different facets of providing medical assistance with smoking and tobacco use cessation.

- *Advising Smokers and Tobacco Users to Quit.* A rolling average represents the percentage of members 18 years of age and older who are current smokers or tobacco users and who received advice to quit during the measurement year.
- *Discussing Cessation Medications.* A rolling average represents the percentage of members 18 years of age and older who are current smokers or tobacco users and who discussed or were recommended cessation medications during the measurement year.
- *Discussing Cessation Strategies.* A rolling average represents the percentage of members 18 years of age and older who are current smokers or tobacco users and who discussed or were provided cessation methods or strategies during the measurement year.

Medication Management for People With Asthma (MMA)

SUMMARY OF CHANGES TO HEDIS 2020

- Updated value sets to identify acute inpatient events for the event/diagnosis.
- Modified medication lists to make them compatible with digital measure formatting.
- Clarified the telehealth requirements for identifying the event/diagnosis.
- Added Benralizumab to the "Anti-interleukin-5" description in the Asthma Controller Medications List.
- Clarified in step 4 that the equation must be multiplied by 100 before rounding to the nearest whole number.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 5–64 years of age during the measurement year who were identified as having persistent asthma and were dispensed appropriate medications that they remained on during the treatment period. Two rates are reported:

1. The percentage of members who remained on an asthma controller medication for at least 50% of their treatment period.
2. The percentage of members who remained on an asthma controller medication for at least 75% of their treatment period.

Definitions

IPSD	Index prescription start date. The earliest prescription dispensing date for any asthma controller medication during the measurement year.
Treatment period	The period of time beginning on the IPSD through the last day of the measurement year.
PDC	Proportion of days covered. The number of days that a member is covered by at least one asthma controller medication, divided by the number of days in the treatment period.
Oral medication dispensing event	One prescription of an amount lasting 30 days or less. To calculate dispensing events for prescriptions longer than 30 days, divide the days supply by 30 and round down to convert. For example, a 100-day prescription is equal to three dispensing events (100/30 = 3.33, rounded down to 3). Allocate the dispensing events to the appropriate year based on the date when the prescription is filled. Multiple prescriptions for different medications dispensed on the same day count as separate dispensing events. If multiple prescriptions for the same medication are dispensed on the same day, sum the days supply and divide by 30. Use the medication lists to determine if drugs are the same or different. Drugs in different medication lists are considered different drugs.

- *Two prescriptions* for different medications dispensed on the same day, each with a 60-day supply, equals four dispensing events (two prescriptions with two dispensing events each).
- *Two prescriptions* for different medications dispensed on the same day, each with a 15-day supply, equals two dispensing events (two prescriptions with one dispensing event each).
- *Two prescriptions* for the same medication dispensed on the same day, each with a 15-day supply, equals one dispensing event (sum the days supply for a total of 30 days).
- *Two prescriptions* for the same medication dispensed on the same day, each with a 60-day supply, equals four dispensing events (sum the days supply for a total of 120 days).

Inhaler dispensing event

When *identifying the eligible population*, use the definition below to count inhaler dispensing events.

All inhalers (i.e., canisters) of the same medication dispensed on the same day count as one dispensing event. Different inhaler medications dispensed on the same day are counted as different dispensing events. For example, if a member received three canisters of Medication A and two canisters of Medication B on the same date, it would count as two dispensing events.

Allocate the dispensing events to the appropriate year based on the date when the prescription was filled.

Use the medication lists to determine if drugs are the same or different. Drugs in different medication lists are considered different drugs.

Injection or intravenous dispensing event

Each injection or intravenous infusion counts as one dispensing event. Multiple dispensed injections of the same or different medications count as separate dispensing events. For example, if a member received two injections of Medication A and one injection of Medication B on the same date, it would count as three dispensing events.

Use the medication lists to determine if drugs are the same or different. Drugs in different medication lists are considered different drugs.

Allocate the dispensing events to the appropriate year based on the date when the prescription was filled.

Calculating number of days covered for the numerator

If multiple prescriptions for different medications are dispensed on the same day, calculate number of days covered by a controller medication using the prescriptions with the longest days supply. For multiple different prescriptions dispensed on different days with overlapping days supply, count each day within the treatment period only once toward the numerator.

If multiple prescriptions for the same medication are dispensed on the same or different day, sum the days supply and use the total to calculate the number of days covered by a controller medication. For example, three controller prescriptions for the same medication are dispensed on the same day, each with a 30-day supply, sum the days supply for a total of 90 days covered by a controller.

Subtract any days supply that extends beyond December 31 of the measurement year.

Use the medication lists to determine if drugs are the same or different. Drugs in different medication lists are considered different drugs.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product lines Commercial, Medicaid (report each product line separately).

Ages Ages 5–64 as of December 31 of the measurement year. Report the following age stratifications and total rate:

- 5–11 years.
- 12–18 years.
- 19–50 years.
- 51–64 years.
- Total.

The total is the sum of the age stratifications for each product line.

Continuous enrollment The measurement year and the year prior to the measurement year.

Allowable gap No more than one gap in enrollment of up to 45 days during each year of continuous enrollment. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage during each year of continuous enrollment.

Anchor date December 31 of the measurement year.

Benefits Medical. Pharmacy during the measurement year.

Event/diagnosis Follow the steps below to identify the eligible population for the measure.

Step 1 Identify members as having persistent asthma who met at least one of the following criteria during both the measurement year and the year prior to the measurement year. Criteria need not be the same across both years.

- At least one ED visit (ED Value Set), with a principal diagnosis of asthma (Asthma Value Set).
- At least one acute inpatient encounter (Acute Inpatient Value Set), with a principal diagnosis of asthma (Asthma Value Set) ***without*** telehealth (Telehealth Modifier Value Set; Telehealth POS Value Set).
- At least one acute inpatient discharge with a principal diagnosis of asthma (Asthma Value Set). To identify an acute inpatient discharge:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
  3. Identify the discharge date for the stay.

- At least four outpatient visits (Outpatient Value Set), observation visits (Observation Value Set), telephone visits (Telephone Visits Value Set) or online assessments (Online Assessments Value Set) on different dates of service, with any diagnosis of asthma (Asthma Value Set) ***and*** at least two asthma medication dispensing events for any controller or reliever medication. Visit type need not be the same for the four visits. Use all the medication lists in the tables below to identify asthma controller and reliever medications.

  Only three of the four visits may be an outpatient telehealth visit, a telephone visit or an online assessment. Identify outpatient telehealth visits by the presence of a telehealth modifier (Telehealth Modifier Value Set) or the presence of a telehealth POS code (Telehealth POS Value Set) associated with the outpatient visit.
- At least four asthma medication dispensing events for any controller or reliever medication. Use all the medication lists in the tables below to identify asthma controller and reliever medications.

Asthma Controller Medications

Description	Prescriptions	Medication Lists	Route
Antiasthmatic combinations	• Dyphylline-guaifenesin	Dyphylline Guaifenesin Medications List	Oral
Antibody inhibitors	• Omalizumab	Omalizumab Medications List	Subcutaneous
Anti-interleukin-5	• Benralizumab	Benralizumab Medications List	Subcutaneous
Anti-interleukin-5	• Mepolizumab	Mepolizumab Medications List	Subcutaneous
Anti-interleukin-5	• Reslizumab	Reslizumab Medications List	Intravenous
Inhaled steroid combinations	• Budesonide-formoterol	Budesonide Formoterol Medications List	Inhalation
Inhaled steroid combinations	• Fluticasone-salmeterol	Fluticasone Salmeterol Medications List	Inhalation
Inhaled steroid combinations	• Fluticasone-vilanterol	Fluticasone Vilanterol Medications List	Inhalation
Inhaled steroid combinations	• Formoterol-mometasone	Formoterol Mometasone Medications List	Inhalation
Inhaled corticosteroids	• Beclomethasone	Beclomethasone Medications List	Inhalation
Inhaled corticosteroids	• Budesonide	Budesonide Medications List	Inhalation
Inhaled corticosteroids	• Ciclesonide	Ciclesonide Medications List	Inhalation
Inhaled corticosteroids	• Flunisolide	Flunisolide Medications List	Inhalation
Inhaled corticosteroids	• Fluticasone	Fluticasone Medications List	Inhalation
Inhaled corticosteroids	• Mometasone	Mometasone Medications List	Inhalation

Description	Prescriptions	Medication Lists	Route
Leukotriene modifiers	• Montelukast	Montelukast Medications List	Oral
Leukotriene modifiers	• Zafirlukast	Zafirlukast Medications List	Oral
Leukotriene modifiers	• Zileuton	Zileuton Medications List	Oral
Methylxanthines	• Theophylline	Theophylline Medications List	Oral

Asthma Reliever Medications

Description	Prescriptions	Medication Lists	Route
Short-acting, inhaled beta-2 agonists	• Albuterol	Albuterol Medications List	Inhalation
Short-acting, inhaled beta-2 agonists	• Levalbuterol	Levalbuterol Medications List	Inhalation

Step 2 A member identified as having persistent asthma because of at least four asthma medication dispensing events, where leukotriene modifiers or antibody inhibitors were the sole asthma medication dispensed in that year, must also have at least one diagnosis of asthma (Asthma Value Set), in any setting, in the same year as the leukotriene modifier or antibody inhibitor (i.e., the measurement year or the year prior to the measurement year).

Step 3: Required exclusions Exclude members who met any of the following criteria:

- Members who had any diagnosis from any of the following value sets, any time during the member's history through December 31 of the measurement year:
  - Emphysema Value Set.
  - Other Emphysema Value Set.
  - COPD Value Set.
  - Obstructive Chronic Bronchitis Value Set.
  - Chronic Respiratory Conditions Due to Fumes or Vapors Value Set.
  - Cystic Fibrosis Value Set.
  - Acute Respiratory Failure Value Set.
- Members who had no asthma controller medications dispensed during the measurement year. Use all the medication lists in the Asthma Controller Medications table above to identify asthma controller medications.

Administrative Specification

Denominator The eligible population.

Numerators

Medication Compliance 50% The number of members who achieved a PDC of at least 50% for their asthma controller medications during the measurement year.

Medication Compliance 75% The number of members who achieved a PDC of at least 75% for their asthma controller medications during the measurement year. Follow the steps below to identify numerator compliance.

Use all the medication lists in the Asthma Controller Medications table above to identify asthma controller medications.

Step 1 Identify the IPSD. The IPSD is the earliest dispensing event for any asthma controller medication during the measurement year.

Step 2 To determine the treatment period, calculate the number of days beginning on the IPSD through the end of the measurement year.

Step 3 Count the days covered by at least one prescription for an asthma controller medication during the treatment period. To ensure that a days supply that extends beyond the measurement year is not counted, subtract any days supply that extends beyond December 31 of the measurement year.

Step 4 Calculate the member's PDC using the following equation. Multiply the equation by 100 and round (using the .5 rule) to the nearest whole number. For example, if a member has 291 total days covered by a medication during a 365-day treatment period, this calculates to 0.7972. Multiply this number by 100, convert it to 79.72% and round it to 80%, the nearest whole number.

$$\frac{\text{Total Days Covered by a Controller Medication in the Treatment Period (step 3)}}{\text{Total Days in Treatment Period (step 2)}}$$

Medication Compliance 50% Sum the number of members whose PDC is ≥50% for their treatment period.

Medication Compliance 75% Sum the number of members whose PDC is ≥75% for their treatment period.

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table MMA-1/2/3: Data Elements for Medication Management for People With Asthma

Data Elements	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	*For each age stratification and total*
Number of required exclusions	*For each age stratification and total*
Numerator events by administrative data	*Each rate, for each age stratification and total*
Numerator events by supplemental data	*Each rate, for each age stratification and total*
Reported rate	*Each rate, for each age stratification and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Medication Management for People With Asthma

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Using product line criteria is not required. Including any product line, combining product lines, or not including product line criteria is allowed.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select "age as of June 30"). The denominator age may be changed if the range is within the specified age range (ages 5–64 years). The denominator age may be expanded to 65 years of age and older.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	Yes, with limits	Only events or diagnoses that contain (or map to) codes in the medication lists and value sets may be used to identify visits. Medication lists, value sets and logic may not be changed. ***Note:*** *This measure uses dispensed medications; modifying the measurement period can affect other dates; however, the order and relationship of the events may not be changed.*
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Required Exclusions	No	Apply required exclusions according to specified value sets.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• Medication compliance 50% • Medication compliance 75%	No	Medication Lists and logic may not be changed.

Medication Reconciliation Post-Discharge (MRP)

SUMMARY OF CHANGES TO HEDIS 2020

- Modified value sets to make them compatible with digital measure formatting.
- Added instructions for identifying acute inpatient events that occur between the admission and discharge dates of a nonacute inpatient stay.
- Clarified the fifth bullet in the hybrid specification.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of discharges from January 1–December 1 of the measurement year for members 18 years of age and older for whom medications were reconciled the date of discharge through 30 days after discharge (31 total days).

Definition

Medication reconciliation	A type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product line	Medicare.
Ages	18 years and older as of December 31 of the measurement year.
Continuous enrollment	Date of discharge through 30 days after discharge (31 total days).
Allowable gap	None.
Anchor date	None.
Benefit	Medical.
Event/diagnosis	An acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year. To identify acute and nonacute inpatient discharges: 1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set). 2. Identify the discharge date for the stay. The denominator for this measure is based on discharges, not members. If members have more than one discharge, include all discharges on or between January 1 and December 1 of the measurement year.

Readmission or direct transfer If the discharge is followed by a readmission or direct transfer to an acute or nonacute inpatient care setting on the date of discharge through 30 days after discharge (31 total days), count only the last discharge. To identify readmissions and direct transfers during the 31-day period:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
2. Identify the admission date for the stay (the admission date must occur during the 31-day period).
3. Identify the discharge date for the stay (the discharge date is the event date).

Exclude both the initial and the readmission/direct transfer discharges if the last discharge occurs after December 1 of the measurement year.

If the admission date and the discharge date for an acute inpatient stay occur between the admission and discharge dates for a nonacute inpatient stay, include only the nonacute inpatient discharge.

Note: *If a member remains in an acute or nonacute care setting through December 1 of the measurement year, a discharge is not included in the measure for this member, but the organization must have a method for identifying the member's status for the remainder of the measurement year, and may not assume the member remained admitted based only on the absence of a discharge before December 1. If the organization is unable to confirm the member remained in the acute or nonacute care setting through December 1, disregard the readmission or direct transfer and use the initial discharge date.*

Administrative Specification

Denominator The eligible population.

Numerator Medication reconciliation (Medication Reconciliation Encounter Value Set; Medication Reconciliation Intervention Value Set) conducted by a prescribing practitioner, clinical pharmacist or registered nurse on the date of discharge through 30 days after discharge (31 total days).

Hybrid Specification

Denominator A systematic sample drawn from the eligible population. Organizations may reduce the sample size using the current year's administrative rate or the prior year's audited, product line-specific rate. Refer to the *Guidelines for Calculations and Sampling* for information on reducing the sample size.

The denominator is based on episodes, not on members. Members may appear more than once in the sample.

Numerator Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse, as documented through either administrative data or medical record review on the date of discharge through 30 days after discharge (31 total days).

Administrative Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record Documentation in the outpatient medical record must include evidence of medication reconciliation and the date when it was performed. Any of the following meets criteria:

- Documentation of the current medications with a notation that the provider reconciled the current and discharge medications.
- Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in medications since discharge, same medications at discharge, discontinue all discharge medications).
- Documentation of the member's current medications with a notation that the discharge medications were reviewed.
- Documentation of a current medication list, a discharge medication list and notation that both lists were reviewed on the same date of service.
- Documentation of the current medications with evidence that the member was seen for post-discharge hospital follow-up with evidence of medication reconciliation or review. Evidence that the member was seen for post-discharge hospital follow-up requires documentation that indicates the provider was aware of the member's hospitalization or discharge.
- Documentation in the discharge summary that the discharge medications were reconciled with the most recent medication list in the outpatient medical record. There must be evidence that the discharge summary was filed in the outpatient chart on the date of discharge through 30 days after discharge (31 total days).
- Notation that no medications were prescribed or ordered upon discharge.

Only documentation in the outpatient medical record meets the intent of the measure, but an outpatient visit is not required.

Note

- *The denominator is based on the discharge date found in administrative/claims data, but organizations may use other systems (including data found during medical record review) to identify data errors and make corrections.*
- *This measure assesses whether medication reconciliation occurred. It does not attempt to assess the quality of the medication list documented in the medical record or the process used to document the most recent medication list in the medical record.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table MRP-3: Data Elements for Medication Reconciliation Post-Discharge

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	✓	✓
Eligible population	✓	✓
Number of numerator events by administrative data in eligible population (before exclusions)		✓
Current year's administrative rate (before exclusions)		✓
Minimum required sample size (MRSS)		✓
Oversampling rate		✓
Number of oversample records		✓
Number of numerator events by administrative data in MRSS		✓
Administrative rate on MRSS		✓
Number of medical records excluded because of valid data errors		✓
Number of employee/dependent medical records excluded		✓
Records added from the oversample list		✓
Denominator		✓
Numerator events by administrative data	✓	✓
Numerator events by medical records		✓
Numerator events by supplemental data	✓	✓
Reported rate	✓	✓

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Medication Reconciliation Post-Discharge

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes	Age determination dates may be changed (e.g., select, "age as of June 30"). Changing denominator age range is allowed.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	Yes, with limits	Only events that contain (or map to) codes in the value sets may be used to identify the eligible population for each rate. The Value sets and logic may not be changed. *Note: Organizations may assess at the member level (vs. discharge level) by applying measure logic appropriately (i.e., percentage of members with documentation of medication reconciliation after each discharge).*
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Exclusions	NA	There are no exclusions for this measure.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Medication Reconciliation	Yes, with limits	Value sets and logic may not be changed. May require medication reconciliation within an alternate time frame.

Multidrug-Resistant Organism & *Clostridioides difficile* Infection (MDRO/CDI) Module

Table of Contents

Background: Methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* spp. (VRE), and certain gram-negative bacilli have increased in prevalence in U.S. hospitals over the last three decades, and have important implications for patient safety. There is concern about these multidrug-resistant organisms (MDROs) as options for treating patients with these infections are often extremely limited, and MDRO infections are associated with increased lengths of stay, costs, and mortality. Many of these traits have also been observed for *Clostridioides difficile* infection (CDI). The Healthcare Infection Control Practices Advisory Committee (HICPAC) has approved guidelines for the control of MDROs. [1] These guidelines are available at https://www.cdc.gov/infectioncontrol/guidelines/MDRO/index.html). The MDRO and *C. difficile* module of NHSN can provide a tool to assist facilities in meeting some of the criteria outlined in the guidelines. In addition, many of the metrics used in this module are consistent with "Recommendations for Metrics for Multidrug-Resistant Organisms in Healthcare Settings: SHEA/HICPAC Position Paper."[2]

Clostridioides difficile (C. difficile) is responsible for a spectrum of *C. difficile* infections (CDI), including uncomplicated diarrhea, pseudomembranous colitis, and toxic megacolon, which can, in some instances, lead to sepsis and even death. Although CDI represents a subset of gastrointestinal tract infections in the current CDC definitions for HAIs, specific standard definitions for CDI [3] should be incorporated to obtain a more complete understanding of how *C. difficile* is being transmitted in a healthcare facility.

As outlined in the HICPAC guideline[1], these MDRO and *C. difficile* pathogens may require specialized monitoring to evaluate if intensified infection control efforts are required to reduce the occurrence of these organisms and related infections. The **goal** of this module is to provide a mechanism for facilities to report and analyze these data that will inform infection prevention professionals of the impact of targeted prevention efforts.

This module contains two core reporting options for MDRO and *C. difficile* – Laboratory Identified (LabID) Event reporting and Infection Surveillance reporting. These reporting options function as two separate and independent reporting methods - one focused on laboratory based reporting and the second on infection criteria based surveillance reporting. Reporting options are summarized in Table 1. Participants may choose either one or both of these reporting options and then may also choose to participate in any of the supplemental monitoring methods described in Table 1.

See Appendix 3: *Differentiating Between LabID Event and Infection Surveillance* for key differences between the two options.

Table 1. Core and Supplemental Reporting Choices for MDRO and CDI Module

Reporting Choices	MDRO			CDI
	MRSA or MRSA/MSSA	**VRE**	**CephR-*Klebsiella*, CRE (*E. coli, Enterobacter, Klebsiella*), *Acinetobacter* spp. (MDR)**	***C. difficile***
Core	**Method**	**Method**	**Method**	**Method**
Proxy Infection Measures LabID Event Choose ≥1 organism	A, B, C, D	A, B, C, D	A, B, C, D	±A, B, C
AND/OR				
Infection Surveillance Choose ≥1 organism	A, B	A, B	A, B	±A, B
Supplemental	**Method**	**Method**	**Method**	**Method**
Prevention Process Measures Options: • Hand Hygiene Adherence	B	B	B	B
• Gown and Gloves Use Adherence	B	B	B	B
• Active Surveillance Testing (AST) Adherence	B	B	N/A	N/A
AST Outcome Measures • Incident and Prevalent Cases using AST	B	B	N/A	N/A

N/A – not available or contraindicated

±No surveillance for *C. difficile* will be performed in Neonatal Intensive Care Units (NICU), Specialty Care Nurseries (SCN), babies in LDRP (Labor, Delivery, Recovery, and Post-partum), well-baby nurseries, or well-baby clinics. And, if conducting facility-wide monitoring (Method C), the denominator counts (admissions, patient-days, encounters) for these locations must be removed.

Reporting Method (must choose to monitor by LabID Event or Infection Surveillance reporting before supplemental methods can also be used for monitoring):

A: **Facility-wide by location.** Report for each location separately and cover all locations in a facility. This reporting method requires the most effort, but provides the most detail for local and national statistical data.

B: **Selected locations within the facility (1 or more).** Report separately for one or more specific locations within a facility. This includes reporting individual events and denominator data for each of the selected locations. This reporting method is ideal for use during targeted prevention programs.

Note: *MDRO "Blood Specimens Only" monitoring is the only MDRO LabID event reporting option for IRF, ED and 24-hr Observation locations. For Inpatient locations other than IRF, ED and 24-hr Observation (examples: IPF, Medical, Surgical, etc.) 'All Specimens" monitoring is the only MDRO LabID event reporting option.*

C: **Overall facility-wide.** Report individual LabID events from each inpatient location and total denominator counts for the entire facility. Options include:

(1) Overall Facility-wide Inpatient (FacWideIN) to cover all inpatient locations where denominator data are collected. When using FacWideIN reporting, facilities must also include location specific reporting for outpatient emergency department (adult and pediatric) and 24-hr Observation location(s).

Note: *When following FacWideIN, facilities must enter denominators for all inpatient locations physically located in the hospital, as well as denominators for all inpatient locations minus any inpatient rehabilitation facility (IRF) and inpatient psychiatric facility (IPF) locations with separate CCNs. Totals reported should not include facilities affiliated with the hospital that are enrolled separately in NHSN. Additionally, separate denominator data will be required to capture encounters for each mapped emergency department and 24-hr observation location.*

(2) Overall Facility-wide Outpatient (FacWideOUT) to cover all outpatient locations affiliated with the facility where encounters are captured. Facilities may choose to monitor FacWideOUT in addition to FacWideIN monitoring.

D: **Overall facility-wide: *Blood Specimens* Only.** This method is available for MDRO LabID Events only and targets the most invasive events. Report individual LabID events from each inpatient location and total denominator counts for the entire facility. Options include:

(1) Overall Facility-wide Inpatient (FacWideIN) to cover all inpatient locations. Using this option, facilities must also include location specific reporting for each

outpatient emergency department (specifically, adult and pediatric) and 24-hr observation location(s).

Note: *When following FacWideIN, facilities must enter denominators for all inpatient locations physically located in the hospital, as well as denominators for all inpatient locations minus any inpatient rehabilitation facility (IRF) and inpatient psychiatric facility (IPF) locations with separate CCNs. Totals reported should not include facilities affiliated with the hospital that are enrolled separately in NHSN. Additionally, separate denominator data will be required to capture encounters for each mapped emergency department and 24-hr observation location.*

(2) Overall Facility-wide Outpatient (FacWideOUT) to cover all outpatient locations affiliated with the facility. Facilities may choose to monitor FacWideOUT in addition to FacWideIN monitoring.

Core Reporting

Option 1: Laboratory-Identified (LabID) Event Reporting

Introduction: LabID Event reporting option allows laboratory testing data to be used without clinical evaluation of the patient, and therefore is a much less labor-intensive method to track MDROs and *C. difficile*. These provide proxy infection measures of MDRO and/or *C. difficile* healthcare acquisition, exposure burden, and infection burden based almost exclusively on laboratory data and limited admission date data, including patient care location. LabID Event reporting is ONLY for collecting and tracking positive laboratory results (for example, positive cultures) that are collected for "clinical" purposes (specifically for diagnosis and treatment). This means that the results of laboratory specimens collected for active surveillance testing (AST) purposes only **should not** be reported as LabID Events.

Key points for LabID Event Reporting:

- LabID Events can be monitored at the overall facility-wide level for inpatient areas (FacWideIN), and/or at the overall facility-wide level for outpatient areas (FacWideOUT).
- At the Overall facility-wide levels and for IRF, ED, and 24-hour observation, MDROs can be monitored for *All Specimen* types or for *Blood Specimens Only*. All other locations can only monitor for *All Specimen* types.
- LabID Events can be monitored for specific locations and require unique denominator data from each of the specific locations (specifically, facility-wide locations monitored separately [Method A] allowing for both facility-wide and location-specific data, or by selected locations only [Method B]).
- A facility choosing to conduct FacWideIN surveillance for LabID Events must also follow location-specific surveillance for that same organism in each outpatient emergency department (pediatric and adult) and 24-hour observation location.

Laboratory and admission data can be used to calculate a variety of distinct proxy measures including: admission prevalence rate and overall patient prevalence rate (measures of exposure burden), MDRO bloodstream infection incidence rate (measure of infection burden and healthcare acquisition), overall MDRO infection/colonization incidence rate (measure of healthcare acquisition), and CD incidence rate (measure of infection burden and healthcare acquisition).

Use NHSN forms to collect all required data, using the definitions of each data field as indicated in the *Tables of Instructions*. When denominator data are available from electronic databases, these sources may be used only after a validation of a minimum 3 consecutive months proves the data to be within 5% (+/-) of the manually collected once-a-day counts.

MDRO LabID Event Reporting

Methodology: Facilities may choose to monitor one or more of the following MDROs: MRSA, MRSA and MSSA, VRE, CephR- *Klebsiella,* CRE, and/or multidrug-resistant *Acinetobacter* spp. (see definitions below). For *S. aureus*, both the resistant (MRSA) and the susceptible (MSSA) phenotypes can be tracked to provide concurrent measures of the susceptible pathogens as a comparison to those of the resistant pathogens in a setting of active MRSA prevention efforts.

Note: No Active Surveillance Culture/Testing (ASC/AST) results are to be included in this reporting of individual results (See *General Key Terms chapter*). Do NOT enter surveillance nasal swabs or other surveillance cultures as reports of LabID Events. AST tracking should be recorded under Process & Outcome Measures.

MDRO Definitions: MDROs included in this module are defined below.

MRSA:	Includes ***S. aureus*** cultured from any specimen that tests oxacillin-resistant, cefoxitin-resistant, or methicillin-resistant by standard susceptibility testing methods, or any laboratory finding of MRSA (includes but not limited to PCR or other molecular based detection methods).
MSSA:	***S. aureus*** cultured from a specimen testing intermediate or susceptible to oxacillin, cefoxitin, or methicillin by standard susceptibility testing method.
VRE:	***Enterococcus faecalis, Enterococcus faecium, or Enterococcus species unspecified*** *(only those not identified to the species level)* that is resistant to vancomycin, by standard susceptibility testing methods or a laboratory finding of VRE (includes but not limited to PCR or other molecular based detection methods).
CephR-*Klebsiella*:	***Klebsiella oxytoca or Klebsiella pneumoniae*** testing non-susceptible (specifically, either resistant or intermediate) to ceftazidime, cefotaxime, ceftriaxone, or cefepime.
CRE:	Any ***Escherichia coli***, ***Klebsiella oxytoca, Klebsiella pneumoniae***, or ***Enterobacter*** **spp**. testing resistant to imipenem, meropenem, doripenem, or ertapenem by standard susceptibility testing methods (specifically, minimum inhibitory concentrations of ≥4 mcg/mL for doripenem, imipenem and meropenem or ≥2 mcg/mL for ertapenem) OR by production of a carbapenemase (specifically, KPC, NDM, VIM, IMP, OXA-48) demonstrated using a recognized test (examples: polymerase chain reaction,

metallo-β-lactamase test, modified-Hodge test, Carba-NP). **Note**: For in-plan CRE surveillance, facilities must conduct surveillance for all three organisms CRE-*E.coli*, CRE-*Enterobacter*, **and** CRE-*Klebsiella (Klebsiella oxytoca* and *Klebsiella pneumoniae*).

MDR-*Acinetobacter:* Any ***Acinetobacter*** spp. testing non-susceptible (specifically, either resistant or intermediate) to at least one agent in at least 3 antimicrobial classes of the following 6 antimicrobial classes:

Class	Antimicrobial	Class	Antimicrobial
Aminoglycosides:	Amikacin Gentamicin Tobramycin	**β-lactam/β-lactam β-lactamase inhibitor combination:**	Piperacillin Piperacillin/tazobactam
Carbapenems:	Imipenem Meropenem Doripenem	**Cephalosporins:**	Cefepime Ceftazidime
Fluoroquinolones:	Ciprofloxacin Levofloxacin	**Sulbactam:**	Ampicillin/sulbactam

Settings: MDRO LabID Event reporting can occur in any location: inpatient or outpatient.

Requirements: Facilities choose at least one of the reporting methods listed below and report data accordingly:

Note: Facilities must indicate each reporting choice chosen for the calendar month on the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

For each MDRO being monitored, all MDRO test results are evaluated using either the algorithm in Figure 1 (*All Specimens*) or Figure 2 (*Blood Specimens only*) to determine reportable LabID events for each calendar month, and for each facility location as determined by the reporting method chosen. If monitoring *all specimens*, all first MDRO isolates (chronologically) per patient, per month, per location are reported as a LabID event regardless of specimen source [EXCLUDES tests related to active surveillance testing] (Figure 1); if a duplicate MDRO isolate is from blood, or if monitoring *blood specimens* only, it is reported as a LabID event only if it represents a unique blood source [specifically, no prior isolation of the MDRO in blood from the same patient and location in ≤2 weeks, even across calendar months] (Figures 1 & 2). As a general rule, at a maximum, there should be no more than 3 blood isolates reported, which would be very rare. If monitoring *all specimens* and a blood isolate is entered as the first specimen of the month, then no *non-blood* specimens can be entered that month for that patient and location. Report each LabID Event individually on a separate form.

Figure 1. MDRO Test Result Algorithm for *All Specimens* Laboratory-Identified (LabID) Events

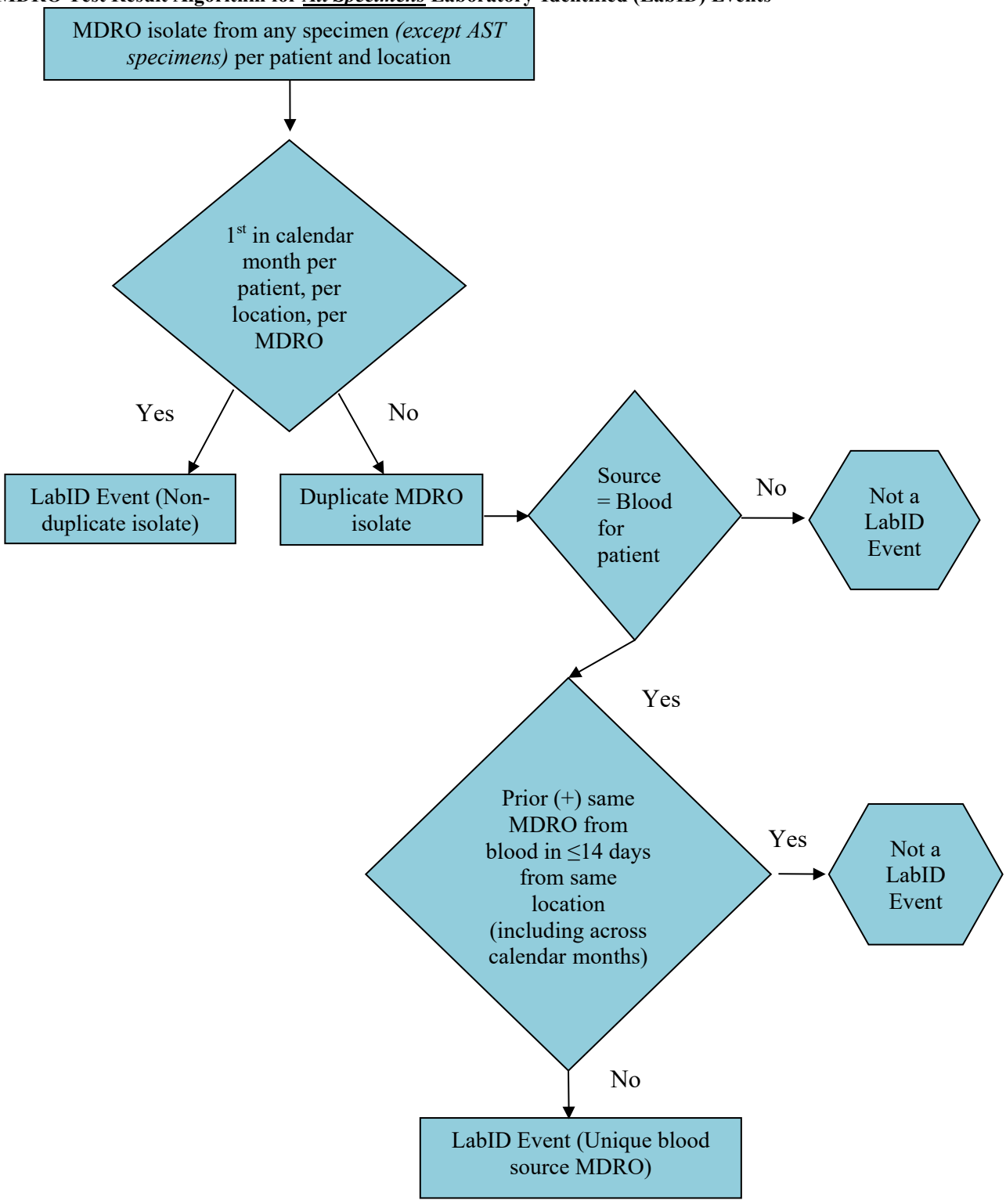


Figure 2. MDRO Test Result Algorithm for *Blood Specimens Only* Laboratory-Identified (LabID) Events

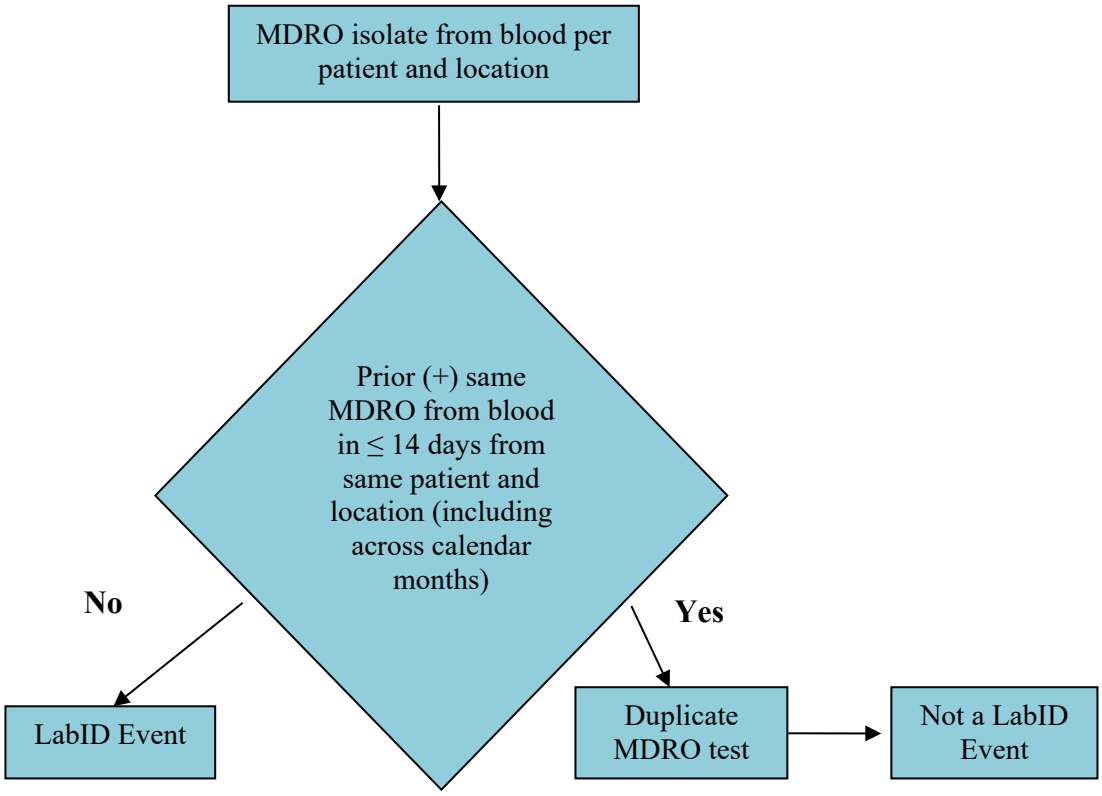


Table 2: Reporting Options for the MDRO Module (non-CDI)

Method	Numerator Data Reporting by Location	Denominator Data Reporting
Facility-wide by location **Note:** Must monitor *All Specimen* sources	Enter each MDRO LabID Event reported by location	Report separate denominators for each location in the facility as specified in the NHSN Monthly Reporting Plan
Selected locations **Note:** Must monitor *All Specimen* sources with the exception of IRF units, 24-hour observation, and emergency department	Enter each MDRO LabID Event reported by selected locations	Report separate denominators for each Selected location(s) monitored as specified in the NHSN Monthly Reporting Plan
Overall Facility-wide Inpatient (FacWideIN), *All Specimen*	Enter each MDRO LabID Specimen Event from all inpatient locations AND separately for outpatient emergency department, and 24-hour observation location(s)	Report total denominator data for **all inpatient locations** physically located in the hospital (for example, total number of admissions and total number of patient days), as well as denominators for all inpatient locations **minus** inpatient rehabilitation facility and inpatient psychiatric facility locations with separate CCNs • Separate denominators should be entered for each mapped outpatient emergency department and 24-hour observation location(s)
Overall Facility-wide Outpatient (FacWideOUT), *All Specimen*	Enter each MDRO LabID Event from all affiliated outpatient locations separately	Report total denominator data for **all outpatient locations** (for example, total number of encounters, including ED and OBS encounters in addition to other outpatient locations)
Overall Facility-wide Inpatient (FacWideIN), *Blood Specimen Only*	Enter each MDRO LabID Blood Specimen Event from all inpatient locations AND separately for outpatient emergency department, and 24-hour observation location(s)	Report total denominator data for **all inpatient locations** physically located in the hospital (for example, total number of admissions and total number of patient days), as well as denominators for all locations **minus** inpatient rehabilitation facility and inpatient psychiatric facility locations with separate CCNs • Separate denominators should be entered for each mapped outpatient emergency department and 24-hour observation location(s)
Overall Facility-wide Outpatient (FacWideOUT), *Blood Specimen Only*	Each MDRO LabID *Blood Specimen* Event from all affiliated outpatient locations by location	Total denominator data for **all outpatient locations** (for example, total number of encounters)

Definitions:

MDRO Isolate: Any specimen, obtained for clinical decision making, testing positive for an MDRO (as defined above). **Note**: Excludes tests related to active surveillance testing.

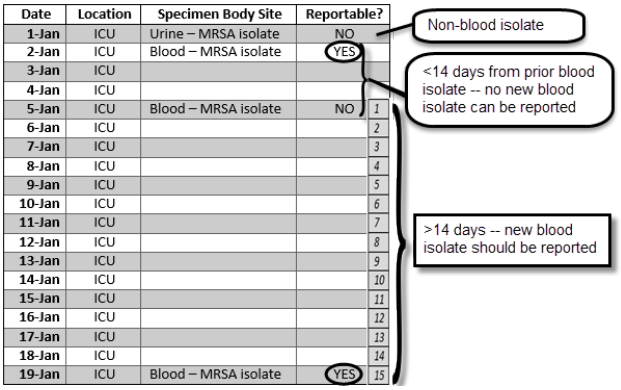
Duplicate MDRO Isolate: If monitoring *all specimens*, any subsequent MDRO isolate from the same patient and location after the first isolate of the specific MDRO during a calendar month, regardless of specimen source, except unique blood source (Figure 1).

> EXAMPLE: On January 2, a newly admitted ICU patient has a positive MRSA urine culture. The following week, while still in the ICU, the same patient has MRSA cultured from an infected decubitus ulcer. The MRSA wound culture is considered a duplicate MDRO isolate, since it is the second non-blood MRSA isolate collected from the same patient and location during the same calendar month.

Unique Blood Source: A MDRO isolate from blood in a patient with no prior positive blood culture for the same MDRO and location in ≤14 days, even across calendar months and different facility admissions (Figure 2). There should be 14 days with no positive blood culture result for the patient, MDRO, and location before another Blood LabID Event is entered into NHSN for the patient, MDRO, and location. Additionally, if following *all specimens,* the first MDRO for the patient, month, and location should be reported. The date of specimen collection is considered Day 1.

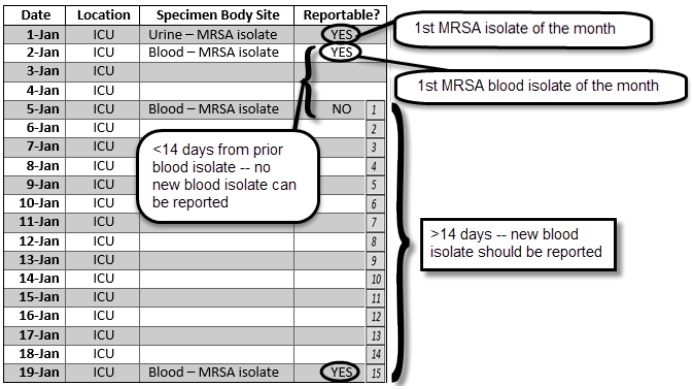
Note: NHSN recommends that facilities keep an internal line listing log of all positive isolates for reference in LabID event reporting which will assist is decision making around the 14-day reporting rule which is location specific.

EXAMPLE: Monitoring *Blood Specimens only* with multiple isolates from same location	On January 1, an ICU patient has a positive MRSA urine culture which is **not entered** into NHSN because blood specimens only are being monitored. On January 2, while in the same location (ICU), the same patient has a positive MRSA blood culture which **is entered** into NHSN. This starts the 14 day count. On January 5, while in the same location (ICU), the same patient has another positive MRSA blood culture which is **not entered** into NHSN because it has not been 14 days since the original positive MRSA blood culture while in the same location. The January 5 positive blood culture starts a new 14 day count. On January 19, while in the same location (ICU), the same patient has another positive MRSA blood culture. The January 19 MRSA blood culture **is entered** into NHSN because it has been > 14 days since the patient's most recent positive blood culture (January 5) while in the **same** location (January 19 is day 15).



Date	Location	Specimen Body Site	Reportable?	
1-Jan	ICU	Urine – MRSA isolate	NO	
2-Jan	ICU	Blood – MRSA isolate	YES	
3-Jan	ICU			
4-Jan	ICU			
5-Jan	ICU	Blood – MRSA isolate	NO	1
6-Jan	ICU			2
7-Jan	ICU			3
8-Jan	ICU			4
9-Jan	ICU			5
10-Jan	ICU			6
11-Jan	ICU			7
12-Jan	ICU			8
13-Jan	ICU			9
14-Jan	ICU			10
15-Jan	ICU			11
16-Jan	ICU			12
17-Jan	ICU			13
18-Jan	ICU			14
19-Jan	ICU	Blood – MRSA isolate	YES	15

EXAMPLE: Monitoring *All Specimens* with multiple isolates from same location	On January 1, an ICU patient has positive MRSA urine culture which **is entered** into NHSN because it is the first MDRO isolate of the month for this patient. On January 2, while in the same location (ICU), the same patient has a positive MRSA blood culture which **is entered** into NHSN because it is the first positive MRSA blood isolate for the month. *No other **non-blood** MRSA isolates should be reported for the month for this patient and location as these would represent duplicate isolates.* Any additional MRSA positive blood isolates for the month should be reported following the same 14-day rule as when reporting *Blood Specimens only.* Subsequent months should be reported in the same manner.



Laboratory-Identified (LabID) Event: All non-duplicate MDRO isolates from any specimen source and unique blood source MDRO isolates. [EXCLUDES tests related to active surveillance testing]. Even if reporting at the Facility Wide level (FacWideIN or FacWideOUT), all reporting must follow rules by location for reporting.

Note: A LabID Event calculator is available on the NHSN website to help with data entry decision making around the 14-day rule, which is location specific.

EXAMPLE #1: Monitoring *Blood Specimens only* with isolates from ED & inpatient location	If monitoring blood specimens for FacWideIN (which requires surveillance in the emergency department and 24-hour observation locations), a patient has a positive MRSA laboratory isolate while in the emergency department (ED). This specimen represents a MRSA LabID Event and should be entered for the outpatient emergency department. The next calendar day, the same patient is admitted to ICU and three days later, has a second positive MRSA blood specimen. This specimen also represents a unique LabID Event, because it is the first positive blood specimen in *this location* (ICU). **Note**: while this patient has two LabID Events, the second specimen taken from the ICU will be removed from most analysis reports.
EXAMPLE #2: Monitoring *All Specimens*	If monitoring *all specimens*, on January 2, a newly admitted ICU patient with no previous positive laboratory isolates during this admission has a positive MRSA urine culture. This specimen represents a LabID Event since it is the first MRSA isolate for the patient, the location, and the calendar month.
EXAMPLE #3: Monitoring *All Specimens* with isolates from ED & inpatient location	If monitoring *all specimens* for FacWideIN surveillance, on January 2, a VRE wound culture is collected from the facility's own ED. The patient is then admitted to 4W the next calendar day. The ED culture result must be entered as an outpatient LabID event for the ED location for January 2, as the ED location is included in FacWideIN surveillance and reporting.
EXAMPLE #4: Monitoring *Blood Specimens only* with multiple blood isolates	If monitoring *blood specimens only*, on January 26, a newly admitted ICU patient with no previous positive laboratory isolates during this admission has a positive MRSA urine culture which is not entered as a LabID Event since *blood specimens* only are being monitored. The following day, while in the same location, the same patient has a positive MRSA blood culture. This specimen represents a LabID Event since it is a unique blood source (the first MRSA **blood** isolate for the same patient and same location). While remaining in ICU, the same patient has another positive blood culture on February 5. This does **not** represent a new LabID Event since it has **not** been >14 days since the most recent MRSA positive blood isolate for this patient and location.

Reporting Instructions:

- All LabID Events must be reported by location
- LabID event reporting is separate and independent of events reported through MDRO Infection Surveillance reporting and/or HAIs reported through the Device-associated and/or Procedure-associated Modules.
- For instructions on unique reporting scenarios, see *Appendix 1. Guidance for Handling MDRO and CDI Module Infection Surveillance and LabID Event Reporting When Also Following Other NHSN Modules*
- For additional reporting information, see *Appendix 3. Differentiating Between LabID Event and Infection Surveillance*

Numerator Data: Data will be reported using the *Laboratory-identified MDRO or CDI Event* form (CDC 57.128).

Denominator Data: Patient days and admissions (for inpatient locations), and encounters (for outpatient locations) are reported using the *MDRO and CDI Monthly Denominator Form* (CDC 57.127).

Reporting FacWideIN Denominators:
Row 1: Facilities will enter total patient days and total patient admissions to reflect all inpatient locations physically located in the hospital.

Row 2: The second row of denominator data entry should reflect all inpatient locations minus inpatient rehabilitation units (IRF units) and inpatient psychiatric units (IPF units) with a separate CCN.

Row 3: The third row of denominator data entry should reflect all inpatient locations minus inpatient rehabilitation units (IRF units) and inpatient psychiatric units (IPF units) with a separate CCN minus baby-based locations (for example, NICU, well baby nursery, etc.). The totals should not include other facility types within the hospital that are enrolled and reporting separately (for example, LTAC). See Table of Instructions for completion instructions.

Note: For Acute Care Hospitals completing FacWideIN surveillance, additional guidance on denominator reporting is available here: https://www.cdc.gov/nhsn/pdfs/cms/acutecare-mrsa-cdi-labiddenominator-reporting.pdf

FacWideOUT, Emergency Departments, 24 hour observation units, and other outpatient units: monthly denominator data are reported as encounters. An encounter is defined as any patient visit to an outpatient location.

Note: For NHSN reporting purposes, the 'date admitted to the facility' is HD 1. When determining a patient's admission dates to both the facility and specific inpatient location, the NHSN user must take into account any days spent in an inpatient location as an "observation" patient before being officially admitted as an inpatient to the facility, as these days contribute to exposure risk. Therefore, all days spent in an inpatient unit, regardless of local admission status and/or billing status are included in the counts of admissions and inpatient days for the facility and specific location; **for NHSN reporting purposes, the date admitted to the facility is the calendar date that the patient physically locates to an inpatient location**. For further information on counting patient days and admissions, see *Appendix 2: Determining Patient Days for Summary Data Collection: Observation vs. Inpatients.*

Data Analysis: Based on data provided on the LabID Event form, each event will be categorized by NHSN to populate different measures. By classifying positive specimens obtained on day 1 (admission date), day 2, and day 3 of admission as community-onset (CO) LabID Events and positive specimens obtained on or after day 4 as healthcare facility-onset (HO) LabID Events, all HO LabID Events will have occurred more than 48 hours after admission.

The following categorizations and prevalence and incidence calculations are built into the analysis capabilities of NHSN, and are based on timing of admission to a facility and/or location, specimen collection, location where specimen was collected, and monthly denominators. Descriptions are provided to explain how the categories and metrics are defined in NHSN.

Note: For FacWideIN analysis reports, the denominator values entered on "Row 2" of the FacWideIN denominator form ares used for MDRO analyses.

Categorizing MDRO LabID Events

Note: See "Onset" variable in the NHSN Line List. This is based on the location of specimen collection, the date admitted to facility, and date specimen collected, as applicable

Community-Onset (CO): LabID Event specimen collected in an outpatient location or an inpatient location ≤3 days after admission to the facility (specifically, days 1, 2, or 3 of admission).

Healthcare Facility-Onset (HO): LabID Event specimen collected >3 days after admission to the facility (specifically, on or after day 4).

The following section describes the various measures calculated for MDRO LabID event surveillance.

Note: FacWideIN MDRO rate and SIR calculations utilize the FacWideIN denominators (patient days and admissions) reported for the facility minus admissions and patient days from inpatient rehabilitation facility (IRF) and inpatient psychiatric facility (IPF) locations with unique CCNs. For NHSN reporting purposes, IRF/IPFs located within an acute care hospital (ACH) are recognized as an inpatient location for the ACH; therefore, admissions/ discharges from ACH to IRF/IPF and vice versa are considered 'transfers', specifically, the hospitalization is considered a 'continuous' stay for event reporting.

Proxy Measures for Exposure Burden of MDROs – *All specimens*:

Inpatient Reporting:

- Admission Prevalence Rate = Number of 1st LabID Events per patient per month identified ≤3 days after admission to the location (if monitoring by inpatient location), or the facility (if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

- Location Percent Admission Prevalence that is Community-Onset = Number of Admission Prevalent LabID Events to a location that are CO / Total number Admission Prevalent LabID Events x 100

- Location Percent Admission Prevalence that is Healthcare Facility-Onset = Number of Admission Prevalent LabID Events to a location that are HO / Total number of Admission Prevalent LabID Events x 100

- Overall Patient Prevalence Rate = Number of 1st LabID Events per patient per month regardless of time spent in location (specifically prevalent + incident, if monitoring by inpatient location), or facility (specifically, CO + HO, if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

Outpatient Reporting:

- Outpatient Prevalence Rate = Number of 1st LabID Events per patient per month for the location (if monitoring by outpatient location), or the facility (if monitoring by overall facility-wide outpatient = FacWideOUT) / Number of patient encounters for the location or facility x 100

Measures for MDRO Bloodstream Infection: Calculated when monitoring either *all specimens* or *blood specimens* only. **Note:** except for certain locations (specifically inpatient

rehabilitation facilities, emergency department, and 24-hour observation locations), the Blood specimens only option can only be used at the FacWideIN and FacWideOUT levels.

MRSA Bloodstream Infection Standardized Infection Ratio (SIR):
The SIR is calculated by dividing the number of observed events by the number of predicted events. The number of predicted events is calculated using LabID probabilities estimated from negative binomial models constructed from 2015 NHSN data, which represents a standard population. For most settings, MRSA Bloodstream Infection SIRs are calculated for FacWideIN surveillance only.

Note: In the NHSN application, the number of predicted events is referred to as "numPred". The SIR will be calculated only if the number of predicted events (numPred) is ≥1 to help enforce a minimum precision criterion.

Inpatient Reporting:

- MRSA Bloodstream Infection SIR = Number of all unique blood source MRSA LabID Events identified in a non-IRF/IPF inpatient location >3 days after admission to the facility (specifically, HO MRSA blood events with no prior MRSA blood event for that patient in the previous 14 days) / Number of predicted HO MRSA blood LabID Events
    - Note: This SIR is only available for FacWideIN reporting. More information about which events are counted in the FacWideIN SIR can be found here: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/mrsacdi_tips.pdf

- MDRO Bloodstream Infection Admission Prevalence Rate = Number of all unique blood source LabID Events per patient per month identified ≤3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall FacWideIN) / Number of patient admissions to the location or facility x 100
    - Note: For MRSA Bacteremia FacWideIN surveillance, this is the CO rate that is used in the risk adjustment calculations of the MRSA bacteremia SIR. The numerator excludes any event in which the patient had a prior positive event in the previous 14 days.

- MDRO Bloodstream Infection Incidence Rate = Number of all unique blood source LabID Events per patient per month identified >3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

- MDRO Bloodstream Infection Incidence Density Rate = Number of all unique blood source LabID Events per patient per month identified >3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall

facility-wide inpatient=FacWideIN) / Number of patient days for the location or facility x 1,000

- MDRO Bloodstream Infection Overall Patient Prevalence Rate = Number of 1st Blood LabID Events per patient per month regardless of time spent in location (specifically, prevalent + incident, if monitoring by inpatient location), or facility (specifically, CO + HO, if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

MRSA Bloodstream Reporting for CMS-certified Inpatient Rehabilitation Facilities (IRFs) mapped as units within a hospital:

Two analytic reports and metrics are available for analyzing MRSA bacteremia LabID event data reported from IRF units located within a hospital:

- MRSA Bloodstream Infection SIR for IRF units = Number of all unique blood source MRSA LabID Events identified >3 days after location admission to the IRF unit and where the patient had no positive MRSA bacteremia LabID Event in the prior 14 days in any CMS-certified IRF unit / Number of predicted HO MRSA blood LabID Events in the IRF unit

- Inpatient MRSA Bacteremia Incidence Density Rate for IRF units: Number of all incident blood source MRSA LabID events identified > 3 days after location admission to an IRF unit and where the patient had no positive MRSA bacteremia LabID Events in the prior 14 days in any CMS-certified IRF unit / Total number of patient days for IRF unit(s) x 1,000

Outpatient Reporting:

- Combined MRSA Bloodstream Infection Outpatient Prevalence Rate for ED and 24 hour Observation Locations = Number of unique blood source MRSA LabID events identified in an ED or 24 hour observation location / Total patient encounters in ED and 24 hour observation location(s) x 100
    - Note: For MRSA Bacteremia FacWideIN surveillance, this outpatient rate is used in the risk adjustment calculations of the MRSA bacteremia SIR. The numerator excludes any event in which the patient had a prior positive event in the previous 14 days in an ED or 24-hour observation location.

- MDRO Bloodstream Infection Outpatient Prevalence Rate = Number of all unique blood source LabID Events per patient per month for the location (if monitoring by outpatient location), or the facility (if monitoring by overall facility-wide outpatient=FacWideOUT) / Number of patient encounters for the location or facility x 100

Measures for MDRO-CRE surveillance: The above incidence and prevalence rates are calculated separately for each species of CRE (specifically, *Klebsiella, E.coli,* and *Enterobacter)* as well as for all species combined. The following additional metric is available for CRE LabID event reporting:

Percent Positive for Carbapenemase: number CRE positive for carbapenemase / number CRE tested for carbapenemase x 100

Proxy Measures for MDRO Healthcare Acquisition:

- Overall MDRO Infection/Colonization Incidence Rate = Number of 1st LabID Events per patient per month among those with no documented prior evidence of previous infection or colonization with this specific organism type from a previously reported LabID Event, and identified >3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient admissions to the location or facility x 100

- Overall MDRO Infection/Colonization Incidence Density Rate = Number of 1st LabID Events per patient per month among those with no documented prior evidence of previous infection or colonization with this specific organism type from a previously reported LabID Event, and identified >3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall facility-wide inpatient=FacWideIN) / Number of patient days for the location or facility x 1,000

Clostridioides difficile (C. difficile) LabID Event Reporting

Methodology: Facilities may choose to monitor *C. difficile* where *C. difficile* testing in the laboratory is performed routinely only on unformed (specifically, conforming to the shape of the container) stool samples. *C. difficile* LabID events may be monitored from all available inpatient locations, emergency departments and 24 hour observation locations as well as all available affiliated outpatient locations where care is provided to patients post discharge or prior to admission (for example, outpatient clinics and/or physician offices using the same medical record number for the patient as the admitting facility).

Settings: *C. difficile* LabID Event reporting can occur in any location: inpatient or outpatient. Surveillance will NOT be performed in NICU, SCN, babies in LDRP, well-baby nurseries, or well-baby clinics. If LDRP locations are being monitored, baby counts must be removed.

Requirements: All C. *difficile* test results are evaluated using the algorithm in Figure 3. Facilities must choose one or more of the reporting choices listed in Table 3 below and report data accordingly.

Figure 3. *C. difficile* Test Result Algorithm for Laboratory Identified (LabID) Events

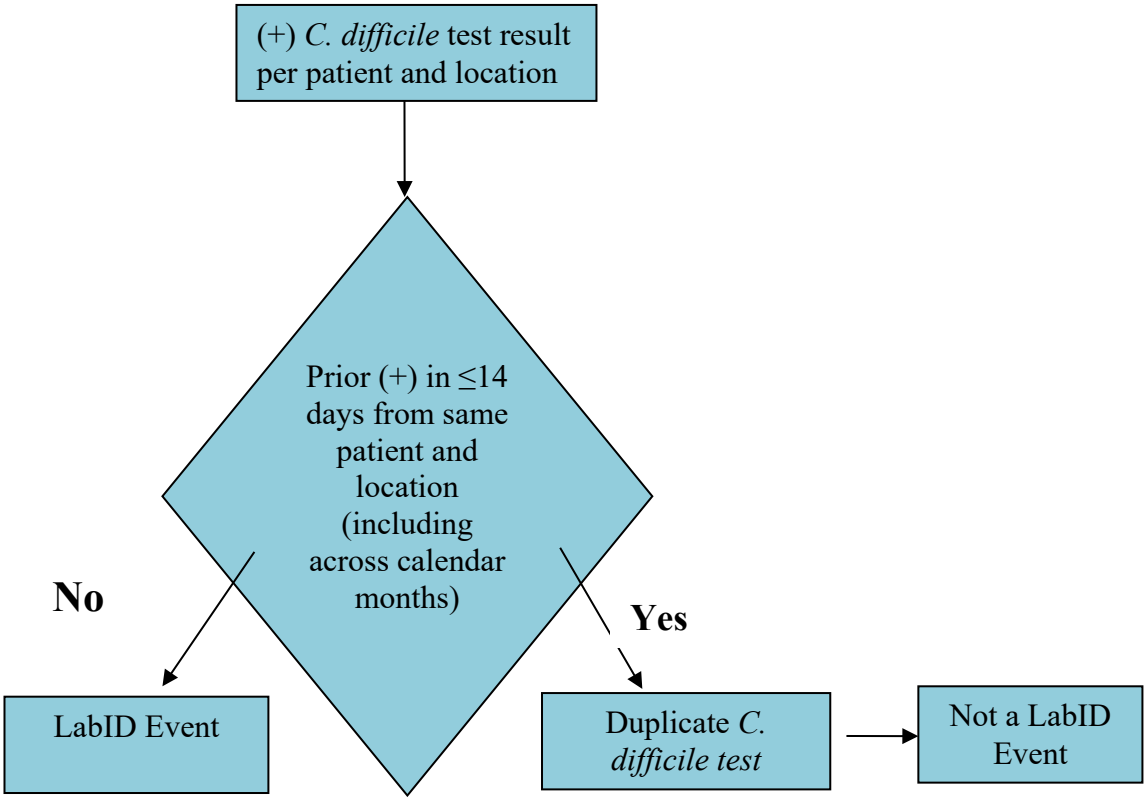


Table 3: Reporting Options for *C. difficile* LabID Event

Method	Numerator Data Reporting by Location	Denominator Data Reporting
Facility-wide by location	Enter each CDiff LabID Event reported by location	Report separate denominators for **each location** in the facility as specified in the NHSN Monthly Reporting Plan
Selected locations	Enter each CDiff LabID Event reported by selected locations	Report separate denominators for **selected locations** monitored as specified in the NHSN Monthly Reporting Plan
Overall Facility-wide Inpatient (FacWideIN)	Enter each CDiff LabID Event from all inpatient locations AND separately for outpatient emergency department and 24-hour observation location(s)	Report total denominator data for **all inpatient locations** physically located in the hospital (for example, total number of admissions and total number of patient days), **minus** inpatient rehabilitation facility and inpatient psychiatric facility locations with unique CCNs • Separate denominators should be entered to capture encounters for each mapped outpatient emergency department and 24-hour observation location(s)
Overall Facility-wide Outpatient (FacWideOUT)	Enter each CDiff LabID Event from all affiliated outpatient locations separately	Report total denominator data for **all outpatient locations** (for example, total number of encounters including ED and OBS encounters in addition to other outpatient locations)

Note: Facilities must indicate each reporting choice chosen for the calendar month on the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions:

CD-positive laboratory assay:
A positive laboratory test result for *C. difficile* toxin A and/or B, (includes molecular assays [PCR] and/or toxin assays) tested on an unformed stool specimen (must conform to the container)
OR
A toxin-producing *C. difficile* organism detected by culture or other laboratory means performed on an unformed stool sample (must conform to the container).

Note:

- When using a multi-step testing algorithm for CDI on the same unformed stool specimen, the finding of the last test performed on the specimen that is documented in the patient medical record will determine if the CDI positive laboratory assay definition is met.

Examples of Multi-step Testing Interpretations (does not consider prior positives):

Multi-step Testing Same Specimen	Testing Step	Testing Method	Documented Findings	Eligible LabID Event?
Example A	Test 1	NAAT	Negative	**Yes**
	Test 2	GDH	Positive	
Last test →	Test 3	EIA	**Positive**	
Example B	Test 1	NAAT	Positive	No
	Test 2	GDH	Positive	
Last test →	Test 3	EIA	Negative	
Example C	Test 1	GDH	Positive	**Yes**
	Test 2	EIA	Negative	
Last test →	Test 3	NAAT	**Positive**	
Example D	Test 1	GDH	Positive	No
	Test 2	EIA	Positive	
Last test →	Test 3	NAAT	Negative	

Duplicate C. *difficile*-positive test:

- Any *C. difficile* toxin-positive laboratory result from the same patient and location, following a previous *C. difficile* toxin-positive laboratory result within 14 days even across calendar months and readmissions to the same facility location.
- There should be 14 days with no *C. difficile* toxin-positive laboratory result for the patient and specific location before another *C. difficile* LabID Event is entered into NHSN for the patient and location.
- The date of specimen collection is considered Day 1.

Note: NHSN recommends each facility keep an internal line listing log of all positive specimens as a reference in LabID event reporting to ensure the 14-day rule is applied correctly. The 14-day rule for LabID events reporting is specific to the location and resets each time a patient transfers to a new inpatient location.

EXAMPLE: On January 1, an ICU patient has a *C. difficile* toxin-positive laboratory result which **is** entered into NHSN. On January 4, while in the same location (ICU), the same patient has another positive *C. difficile* toxin-positive laboratory result which is **not** entered into NHSN because it is a duplicate for the patient and location (has not been >14 days since the original *C. difficile* toxin-positive laboratory result while in the same location). On January 16, while in the same location (ICU), the same patient has another *C. difficile* toxin-positive laboratory result.

While it has been more than 14 days since the initial positive *C. difficile* toxin-positive laboratory result was entered into NHSN (January 1) for the same patient and same location, it has not been >14 days since the patient's most recent *C. difficile* toxin-positive laboratory result (January 4) **while in the same location**. Therefore, the *C. difficile* toxin-positive laboratory result for January 16 is **not** entered into NHSN. On January 31, the patient has another *C. difficile* toxin-positive laboratory result while in the same location (ICU). Since it has been >14 days since the patient's most recent *C. difficile* toxin-positive laboratory result (January 16) while in the same location, this event **is** entered into NHSN.

Laboratory-Identified (LabID) Event*:* All non-duplicate *C. difficile* toxin-positive laboratory results. Even if reporting at the facility-wide level (FacWideIN or FacWideOUT), all reporting must follow rules by location for reporting.

Notes:

- A LabID Event calculator is available on the NHSN website to help with data entry decision making around the location specific 14-day rule.
- If a facility is participating in FacWideIN surveillance and reporting, the facility must also conduct separate location-specific surveillance in all outpatient emergency department and 24-hour observation locations. This means LabID Events for the same organism and LabID Event type must be reported from these locations even if the patient is not subsequently admitted to an inpatient location during the same encounter.
- All emergency department and 24-hour observation locations must be identified and mapped as outpatient locations within NHSN. For more information about mapping locations, see Chapter 15 in the NHSN manual.

Reporting Instructions: All *C. difficile* LabID Events must be reported by location and separately and independently of Events reported using the *C. difficile* Infection Surveillance reporting option and/or HAI reporting.

Numerator: Data will be reported using the *Laboratory-Identified MDRO or CDI Event* form (CDC 57.128).

Denominator Data: Patient days and admissions (for inpatient locations), and encounters (for outpatient locations) are reported using the MDRO and CDI Monthly Denominator Form (CDC 57.127).

Reporting FacWideIN Denominators:
Row 1: Facilities will enter total patient days and total patient admissions to reflect all inpatient locations physically located in the hospital.

Row 2: The second row of denominator data entry should reflect all inpatient locations minus inpatient rehabilitation units (IRF units) and inpatient psychiatric units (IPF units) with a separate CCN.

Row 3: The third row of denominator data entry should reflect all inpatient locations minus inpatient rehabilitation units (IRF units) and inpatient psychiatric units (IPF units) with a separate CCN minus baby-based locations (for example, NICU, well baby nursery, etc.). The totals should not include other facility types within the hospital that are enrolled and reporting separately (for example, LTAC). See Table of Instructions for completion instructions.

Note: For Acute Care Hospitals completing FacWideIN surveillance, additional guidance on denominator reporting is available here: https://www.cdc.gov/nhsn/pdfs/cms/acutecare-mrsa-cdi-labiddenominator-reporting.pdf

FacWideOUT and ED/24-hour Observation locations reporting: Denominator data is provided using encounters. An encounter is defined as a patient visit to an outpatient location for care.

When determining a patient's admission dates to both the facility and specific inpatient location, the NHSN user must take into account all days, including any days spent in an inpatient location as an "observation" patient before being officially admitted as an inpatient to the facility, as these days contribute to exposure risk. Therefore, all days spent in an inpatient unit, regardless of admission and/or billing status are included in the counts of admissions and inpatient days for the facility and specific location. For NHSN reporting purposes, the facility and specific location admission date is the first day spent in the inpatient location. For further information on counting patient days and admissions, see *Appendix 2: Determining Patient Days for Summary Data Collection: Observation vs. Inpatients*

C. Difficile Data Analysis:

The following categorizations and prevalence and incidence calculations are built into the analysis capabilities of NHSN, and are based on timing of admission to a facility and/or location, specimen collection date, location where specimen was collected, and monthly denominators. Descriptions are provided to explain how the categories and metrics are defined in NHSN.
Note: For FacWideIN analysis reports, the denominator values entered on "Row 3" of the FacWideIN denominator form as used for CDI analyses.

CDI Event Categorization

Note: This is based on current date of specimen collection and prior date of specimen collection of a previous CDI LabID Event. Refer to the "cdiAssay" variable in NHSN Line List.

- Incident CDI LabID Event: Any CDI LabID Event from a specimen obtained > 56 days after the most recent CDI LabID Event (or with no previous CDI LabID Event documented) for that patient. Note: the date of first specimen collection is considered day 1.

- Recurrent CDI LabID Event: Any CDI LabID Event from a specimen obtained > 14 days and ≤ 56 days after the most recent CDI LabID Event for that patient. Note:the date of first specimen collection is considered day 1.

- CdiAssay will be unassigned, or "blank", for any CDI LabID event that was collected ≤ 14 days after the most recent CDI LabID event for that patient.

Note: Beginning in 2015, for FacWideIN surveillance, cdiAssay is assigned based on Events from inpatient locations, emergency departments, and 24-hour observation locations. For data reported prior to 2015, cdiAssay was assigned based on events from within the same setting only. For example, in 2014, if performing both FacWideIN and FacWideOUT surveillance, cdiAssay of inpatient CDI LabID Events was determined by a review of previously-entered CDI LabID Events from inpatient locations only.

In addition to the cdiAssay categorization, CDI LabID Events are further categorized within NHSN using the 'onset' variable. The following categorizations, as well as prevalence and incidence calculations that are built into the analysis capabilities of NHSN, are based on timing of admission to facility and/or location, specimen collection date, location where specimen was collected, and previous discharge. Descriptions are provided to explain how the categories and metrics are defined in NHSN.

Note: See "Onset" variable in NHSN Line List.

- Community-Onset (CO): LabID Event meeting one of the following criteria:
  - A) collected in an outpatient location in which the patient was not previously discharged from an inpatient location within the same facility ≤ 28 days prior to current date of specimen collection
  - B) collected in an inpatient location ≤3 days after admission to the facility (specifically, days 1, 2, or 3 of admission).

- Community-Onset Healthcare Facility-Associated (CO-HCFA): CO LabID Event collected from an inpatient or an outpatient location from a patient who was discharged from the facility ≤ 28 days prior to current date of stool specimen collection. The previous discharge must have been from an inpatient location within the same facility (in other words, an outpatient visit does not qualify as "admitted", and therefore is not used to set the timeline for CO-HCFA).

- Healthcare Facility-Onset (HO): LabID Event collected from an inpatient location >3 days after admission to the facility (specifically, on or after day 4).

The following section describes the various measures calculated for CDI LabID event surveillance.

Note: Beginning with 2015 data, the number of FacWideIN admissions and number of FacWideIN patient days used in the various CDI rate and SIR calculations will represent those reported for the facility minus admissions and patient days from the following: IRF and IPF locations with unique CCNs separate from the reporting facility, neonatal ICUs, special care nurseries, and well-baby locations. The CDI rate and SIR calculations use the denominators entered on Row 3 of the FacWideIN denominator form.

Measures of CDI Prevalence:

- Inpatient Admission Prevalence Rate = Number of non-duplicate CDI LabID Events per patient per month identified ≤3 days after admission to the location (if monitoring by inpatient location), or facility (if monitoring by overall facility-wide inpatient=FacWideIN) (includes CO and CO-HCFA events) / Number of patient admissions to the location or facility x 100
  - Note: See "CDIF_admPrevRate" in the NHSN Rate Tables.

- Community-Onset Admission Prevalence Rate = Number of inpatient CDI LabID events that are CO, per month, in the facility / Number of patient admissions to the facility x 100

  Note: See "CDI_COprevRate" in the NHSN Rate Tables. This calculation is only accurate for overall FacWideIN reporting. For CDI FacWideIN

surveillance, this is the CO rate that is used in the risk adjustment calculations of the CDI SIR.

- Inpatient Percent Admission Prevalence that is Community-Onset = Number of Admission Prevalent LabID Events to a location that are CO / Total number Admission Prevalent LabID Events x 100
    - Note: See "CDIF_pctAdmPrevCO" in the NHSN Rate Tables. This percentage is available for unit-specific CDI surveillance and is calculated separately for each applicable unit. The numerator in this formula does not include CDI LabID events labeled as CO-HCFA.

- Inpatient Percent Admission Prevalence that is Community-Onset Healthcare Facility-Associated = Number of Admission Prevalent LabID Events to a location that are CO-HCFA / Total number Admission Prevalent LabID Events x 10
    - Note: See "CDIF_pctAdmPrevCOHCFA". This percentage is available for unit-specific CDI surveillance and is calculated separately for each applicable unit.

- Inpatient Percent Admission Prevalence that is Healthcare Facility-Onset = Number of Admission Prevalent LabID Events to a location that are HO / Total number of Admission Prevalent LabID Events x 100
    - Note: See "CDIF_pctAdmPrevHO" in the NHSN Rate Tables. This percentage is available for unit-specific CDI surveillance and is calculated separately for each applicable unit.

- Inpatient Overall Patient Prevalence Rate = Number of 1st CDI LabID Events per patient per month regardless of time spent in location (specifically, prevalent + incident, if monitoring by inpatient location), or facility (specifically, CO + CO-HCFA + HO, if monitoring by FacWideIN) / Number of patient admissions to the location or facility x 100
    - Note: See "CDIF_prevRate" in the NHSN Rate Tables.

- Outpatient Prevalence Rate = Number of all non-duplicate CDI LabID Events per patient per month for the location (if monitoring by outpatient location), or the facility (if monitoring by overall facility-wide outpatient=FacWideOUT) / Number of patient encounters for the location or facility x 100

Measures of CDI Incidence:

- CDI Standardized Infection Ratio (SIR):

The SIR is calculated by dividing the number of observed events by the number of predicted events. The number of predicted events is calculated using LabID probabilities estimated from

negative binomial models constructed from 2015 NHSN data, which represents a standard population. For most settings, CDI SIRs are calculated for FacWideIN surveillance only.

Note: In the NHSN application, the number of predicted events is referred to as "numPred". The SIR will be calculated only if the number of predicted events (numPred) is ≥1, to help enforce a minimum precision criterion. The CDI SIRs are only calculated at the quarter level or higher in order to account for the quarterly-reporting of CDI test type. Note that SIRs will not be calculated for a quarter until the CDI test type has been reported. When the FacWideIN MDRO denominator form is completed for the last month of each quarter, users are asked to report the primary type of test that was used to identify CDI in the hospital for that quarter. That test type is then used in the calculation of the FacWideIN CDI SIR for that quarter. The test type selected should reflect the testing methodology used for clinical decision making.

- Facility CDI Incidence SIR = Number of all Incident CDI LabID Events identified in a non-IRF/IPF location >3 days after admission to the facility (specifically, HO events with no prior positive events for that patient in the previous 14 days) / Number of predicted Incident HO CDI LabID Events
    - Note: This SIR is only available for FacWideIN reporting. More information about which events are counted in the FacWideIN CDI SIR can be found here: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/mrsacdi_tips.pdf

- Inpatient Location CDI Incidence Rate = Number of Incident CDI LabID Events per month identified >3 days after admission to the location / Number of patient days for the location x 10,000
    - Note: See "CDIF_incRate" in the NHSN Rate Tables. This rate is only available for location-specific CDI surveillance.

- Inpatient Facility CDI Healthcare Facility-Onset Incidence Rate = Number of all Incident HO CDI LabID Events per month in the facility / Number of patient days for the facility x 10,000
    - Note: See "CDIF_HOIncRate" in the NHSN Rate Tables. (This calculation is only available for FacWideIN reporting.)

- Inpatient Facility CDI Combined Incidence Rate = Number of all Incident HO and CO-HCFA CDI LabID Events per month in the facility / Number of patient days for the facility x 10,000
    - Note: See "CDIF_facIncRate" in the NHSN Rate Tables. (This calculation is only available for FacWideIN reporting.)

***C. difficile* Reporting for CMS-certified Inpatient Rehabilitation Facilities (IRFs) mapped as units within a hospital:**

IRF units within a hospital that participate in the CMS Inpatient Rehabilitation Facility Quality Reporting Program will be given a CDI SIR separate from the FacWideIN SIR for the acute care hospital. The SIR will be sent to CMS on behalf of IRF units participating in the CMS IRF Quality Reporting Program. In addition, a CDI LabID Event incidence rate is available for IRF units.

- Inpatient CDI SIR for IRF units: Number of all incident CDI LabID events identified > 3 days after location admission to an IRF unit and where the patient had no positive CDI LabID events in the prior 14 days in any CMS-certified IRF unit / Number of predicted incident CDI LabID events in the IRF unit(s)
    - Note: This SIR is only available for CMS-certified IRF units located within an acute care or critical access hospital. The CDI SIR for IRF Units is only calculated at the quarter level or higher in order to account for the quarterly-reporting of CDI test type. Note that SIRs will not be calculated for a quarter until the CDI test type has been reported. When the IRF Unit's MDRO denominator form is completed for the last month of each quarter, users are asked to report the primary type of test that was used to identify CDI for that quarter. That test type is then used in the calculation of the IRF Unit's CDI SIR for that quarter. More information about which events are counted in the IRF Unit's CDI SIR can be found here: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/mrsacdi_tips.pdf

- Inpatient CDI Incidence Density Rate for IRF units: Number of all incident CDI LabID events identified > 3 days after location admission to an IRF unit and where the patient had no positive CDI LabID events in the prior 14 days in any CMS-certified IRF unit / Total number of patient days for IRF units x 10,000
    - Note: See "CDIF_IRFIncRate" in the NHSN Rate Tables. This rate is only available for CMS-certified IRF units located within an acute care or critical access hospital

Table 4. Measures Delivered to CMS For Facilities Participating in Quality Reporting Programs: MRSA Bloodstream Infection and *C. difficile* LabID Events

Facility Type	**CMS Quality Reporting Program**	**MRSA Bloodstream Infection LabID Event Measure Sent to CMS**	***C. difficile* LabID Event Measure Sent to CMS**
General Acute Care Hospitals	Inpatient Quality Reporting Program	MRSA Bloodstream Infection SIR (FacWideIN)	CDI Incidence SIR (FacWideIN)
Long Term Care Hospitals (referred to as Long Term Acute Care Hospitals in NHSN)	Long Term Care Hospital Quality Reporting Program	NONE*	CDI Incidence SIR (FacWideIN)
Inpatient Rehabilitation Facilities (IRFs)	Inpatient Rehabilitation Facility Quality Reporting Program	**IRF units within a hospital**: NONE*	**IRF units within a hospita**l: CDI Incidence SIR for IRF Units
		Free-standing IRFs: NONE*	**Free-standing IRFs**: CDI Incidence SIR (FacWideIN)

*****Starting with 2018 Q4 data, CMS removed the requirement for IRFs and LTACs to report MRSA bacteremia LabID Events as part of the CMS Quality Reporting Program. However, MRSA bacteremia LabID Event analysis reports, including the SIR, are still available to all facilities.

Option 2: Infection Surveillance Reporting

Introduction: The Infection Surveillance reporting option for MDRO and *C. difficile* infections enables users to utilize the CDC/NHSN healthcare-associated infections definitions for identifying and reporting infections associated with MDROs and/or *C. difficile*. Surveillance must occur from at least one patient care area and requires active, patient-based, prospective surveillance of the chosen MDRO(s) and/or *C. difficile* infections (CDIs) by a trained Infection Preventionist (IP). This means that the IP shall seek to confirm and classify infections caused by the chosen MDRO(s) and/or *C. difficile* for monitoring during a patient's stay in at least one patient care location during the surveillance period. These data will enhance the ability of NHSN to aggregate national data on MDROs and CDIs.

A. MDRO Infection Surveillance Reporting

Methodology: Facilities may choose to monitor one or more of the following MDROs: MRSA, MRSA and MSSA, VRE, CephR- *Klebsiella*, CRE (CRE-*Klebsiella,* CRE-*E. coli*, **and** CRE-*Enterobacter)*, and multidrug-resistant *Acinetobacter* spp. (See definitions in Section I, Option 1A). For S. *aureus*, both the resistant (MRSA) and the susceptible (MSSA) phenotypes can be tracked to provide concurrent measures of the susceptible pathogens as a comparison to those of the resistant pathogens in a setting of active MRSA prevention efforts. **Note:** No Active Surveillance Culture/Testing (ASC/AST) results are to be included in this reporting of individual results.

Settings: Infection Surveillance can occur in any inpatient location where such infections may be identified and where denominator data can be collected, which may include critical/intensive care units (ICU), specialty care areas (SCA), neonatal units, step-down units, wards, and chronic care units. In Labor, Delivery, Recovery, & Post-partum (LDRP) locations, where mom and babies are housed together, users must count both mom and baby in the denominator. If moms only are being counted, then multiply moms times two to include both mom and baby in denominators.

Requirements: Surveillance for all types of NHSN-defined healthcare-associated infections (HAIs), regardless if HAI is included in "in-plan" or "off- plan" surveillance, of the MDRO selected for monitoring in at least one location in the healthcare facility as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions: MDROs included in this module are defined in Section I, Option 1A. Refer to *CDC/NHSN Surveillance Definitions for Specific Types of Infections* for infection site criteria.

Location of Attribution and Transfer Rule applies – See Identifying HAIs in NHSN chapter (Chapter 2).

Reporting Instructions: If participating in MDRO/CDI Infection Surveillance and/or LabID Event Reporting, along with the reporting of HAIs through the Device-Associated and/or Procedure-Associated Modules, see *Appendix 1: Guidance for Handling MDRO/CDI Module Infection Surveillance and LabID Event Reporting When Also Following Other NHSN Modules*, for instructions on unique reporting scenarios.

Numerator Data: Number of healthcare-associated infections, by MDRO type. Infections are reported on the appropriate NHSN forms: *Primary Bloodstream Infection, Pneumonia, Ventilator-Associated Event, Urinary Tract Infection, Surgical Site Infection, or MDRO or CDI Infection Event (CDC 57.108, 57.111, 57.112, 57.114, 57.120, and 57.126, respectively.).* See the *Table of Instructions,* located in each of the applicable chapters, for completion instructions.

Denominator Data: Number of patient days and admissions. Patient days and admissions are reported by location using the *MDRO and CDI Monthly Denominator Form* (CDC 57.127). See *Table of Instructions* for completion instructions.

Data Analysis: Data are stratified by time (for example, month, quarter, etc.) and patient care location. *MDRO Infection Incidence Rate* = Number of HAIs by MDRO type / Number of patient days x 1000

B. *Clostridium difficile* Infection Surveillance Reporting

Methodology: *C. difficile* Infection (CDI) Surveillance, reporting on all NHSN-defined healthcare-associated CDIs from at least one patient care area, is one reporting option for *C. difficile* (part of your facility's Monthly Reporting Plan). These data will enhance the ability of NHSN to aggregate national data on CDIs.

Settings: Infection Surveillance will occur in any inpatient location where denominator data can be collected, which may include critical/intensive care units (ICU), specialty care areas (SCA), step-down units, wards, and chronic care units. Surveillance will NOT be performed in Neonatal Intensive Care Units (NICU), Specialty Care Nurseries (SCN), babies in LDRP, or well-baby nurseries. If LDRP locations are being monitored, baby counts must be removed.

Requirements: Surveillance for CDI must be performed in at least one location in the healthcare institution as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106).

Definitions: Report all healthcare-associated infections where *C. difficile*, identified by a positive toxin result including toxin producing gene [PCR]), is the associated pathogen, according to the Repeat Infection Timeframe (RIT) rule for HAIs (See Identifying HAIs in NHSN chapter). Refer to specific definitions in *CDC/NHSN Surveillance Definitions for Specific Types of Infections* chapter for *C. difficile* gastrointestinal system infection (GI-CDI).

HAI cases of CDI that meet criteria for a healthcare-associated infection should be reported as *Clostridioides difficile* gastrointestinal system infection (GI-CDI). Report the pathogen as C. *difficile* on the *MDRO or CDI Infection Event* form (CDC 57.126). If the patient develops GI-CDI, and GI-GE or GI-GIT, report the GI-CDI and the GI-GE or GI-GIT only if additional enteric organisms are identified and applicable criteria are met. **Note:** CDI laboratory-identified event (LabID Event) categorizations (for example, recurrent CDI assay, incident CDI assay, healthcare facility-onset, community-onset, community-

onset healthcare facility-associated) do **not** apply to HAIs including *C. difficile* associated gastrointestinal system infections (GI-CDI). Each new GI-CDI must be reported according to the HAI rules outlined in *Identifying HAIs in NHSN* chapter.

CDI Complications: CDI in a case patient within 30 days after CDI symptom onset with at least one of the following:

1. Admission to an intensive care unit for complications associated with CDI (for example: for shock that requires vasopressor therapy);
2. Surgery (for example, colectomy) for toxic megacolon, perforation, or refractory colitis
   AND/OR
3. Death caused by CDI within 30 days after symptom onset and occurring during the hospital admission.

Location of Attribution and Transfer Rule apply to Infection Surveillance – See *Identifying HAIs in NHSN* chapter.

Numerator Data: Number of healthcare-associated *C. difficile* infections. Infections are reported on the *MDRO or CDI Infection Event* form (CDC 57.126). See *Tables of Instructions* for completion instructions.

Denominator Data: Number of patient days and admissions by location are reported using the *MDRO and CDI Monthly Denominator Form* (CDC 57.127). See *Tables of Instructions* for completion instructions.

C. difficile Infections:

Numerator: The total number of HAI CDI cases identified during the surveillance month for a location.

Denominator: The total number of patient days and admissions during the surveillance month for a location.

Data Analysis: Data are stratified by time (for example, month, quarter, etc.) and by patient care location.

C. difficile Infection Incidence Rate = Number of HAI CDI cases / Number of patient days x **10,000**

II. Supplemental Reporting

1. Prevention Process Measures Surveillance

a. Monitoring Adherence to Hand Hygiene

Introduction: This option will allow facilities to monitor adherence to hand hygiene after a healthcare worker (HCW) has contact with a patient or inanimate objects in the immediate vicinity of the patient. Research studies have reported data suggesting that improved after-contact hand hygiene is associated with reduced MDRO transmission. While there are multiple opportunities for hand hygiene during patient care, for the purpose of this option, only hand hygiene after contact with a patient or inanimate objects in the immediate vicinity of the patient will be observed and reported. (http://www.cdc.gov/handhygiene/)

Settings: Surveillance will occur in any location: inpatient or outpatient.

Requirements: Surveillance for adherence to hand hygiene in at least one location in the healthcare institution for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). This should be done in patient care locations also selected for Infection Surveillance or LabID Event reporting.

In participating patient care locations, perform at least 30 different unannounced observations after contact with patients for as many individual HCWs as possible. For example, try to observe all types of HCWs performing a variety of patient care tasks during the course of the month, not only nurses, or not only during catheter or wound care. No personal identifiers will be collected or reported.

Definitions:

Antiseptic handwash: Washing hands with water and soap or other detergents containing an antiseptic agent.

Antiseptic hand-rub: Applying an antiseptic hand-rub product to all surfaces of the hands to reduce the number of microorganisms present.

Hand hygiene: A general term that applies to either: handwashing, antiseptic hand wash, antiseptic hand rub, or surgical hand antisepsis.

Handwashing: Washing hands with plain (specifically, non-antimicrobial) soap and water.

Numerator: Hand Hygiene Performed = Total number of observed contacts during which a HCW touched either the patient or inanimate objects in the immediate vicinity of the patient and appropriate hand hygiene was performed.

Denominator: Hand Hygiene Indicated = Total number of observed contacts during which a HCW touched either the patient or inanimate objects in the immediate vicinity of the patient and therefore, appropriate hand hygiene was indicated.
Hand hygiene process measure data are reported using the *MDRO and CDI Monthly Denominator Form* (CDC 57. 127). See Tables of Instructions for completion instructions.

Data Analysis: Data are stratified by time (for example, month, quarter, etc.) and patient care location.

Hand Hygiene Percent Adherence = Number of contacts for which hand hygiene was performed / Number of contacts for which hand hygiene was indicated x 100

b. Monitoring Adherence to Gown and Gloves Use as Part of Contact Precautions

Introduction: This option will allow facilities to monitor adherence to gown and gloves use when a HCW has contact with a patient or inanimate objects in the immediate vicinity of the patient, when that patient is on Transmission-based Contact Precautions. While numerous aspects of adherence to Contact Precautions could be monitored, this surveillance option is only focused on the use of gown and gloves. (http://www.cdc.gov/ncidod/dhqp/gl_isolation_contact.html)

Settings: Surveillance can occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care areas, (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (for example, surgical wards).

Requirements: Surveillance for adherence to gown and gloves use in at least one location in the healthcare institution for at least 1 calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). Ideally, this should be done in patient care locations also selected for Infection Surveillance or LabID Event reporting.

Among patients on Transmission-based Contact Precautions in participating patient care locations, perform at least 30 unannounced observations. A total of thirty different contacts must be observed monthly among HCWs of varied occupation types. For example, try to observe all types of HCWs performing a variety of patient care tasks during the course of the month, not only nurses, or not only during catheter or wound care. Both gown and gloves must be donned appropriately prior to contact for compliance. No personal identifiers will be collected or reported.

Definitions:

Gown and gloves use**:** In the context of Transmission-based Contact Precautions, the donning of both a gown and gloves prior to contact with a patient or inanimate objects in the immediate vicinity of the patient. Both a gown and gloves must be donned appropriately prior to contact for compliance.

Numerator: Gown and Gloves Used = Total number of observed contacts between a HCW and a patient or

inanimate objects in the immediate vicinity of a patient on Transmission-based Contact Precautions for which gown and gloves had been donned appropriately prior to the contact.

Denominator: Gown and Gloves Indicated = Total number of observed contacts between a HCW and a patient on Transmission-based Contact Precautions or inanimate objects in the immediate vicinity of the patient and therefore, gown and gloves were indicated.

Gown and gloves use process measure data are reported using the *MDRO and CDI Monthly Denominator Form* (CDC 57.127). See *Tables of Instructions* for completion instructions.

Data Analysis: Data are stratified by time (for example, month, quarter, etc.) and patient care location. *Gown and Glove Use Percent Adherence* = Number of contacts for which gown and gloves were used appropriately / Number of contacts for which gown and gloves were indicated x 100

c. Monitoring Adherence to Active Surveillance Testing

Introduction: This option will allow facilities to monitor adherence to active surveillance testing (AST) of MRSA and/or VRE, using culturing or other methods.

Settings: Surveillance will occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care areas, (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (for example, surgical wards).

Requirements: Surveillance of AST adherence in at least one location in the healthcare facility for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). A facility may choose to report AST for MRSA and/or VRE in one or multiple patient care locations, as the facility deems appropriate. Ideally, this should be done in patient care locations also selected for Infection Surveillance or LabID Event reporting. To improve standardization of timing rules for AST specimen collection, classify admission specimens as those obtained on day 1 (admission date), day 2, or day 3 (specifically, ≤3 days). Classify discharge/transfer AST specimens as those collected on or after day 4 (specifically, >3 days).

Definitions:

AST Eligible Patients: Choose one of two methods for identifying patients that are eligible for AST:

All = All patients in the selected patient care area regardless of history of MRSA or VRE infection or colonization.

OR

NHx = All patients in the selected patient care area who have NO documented positive MRSA or VRE infection or colonization during the previous 12 months (as ascertained by either a facility's laboratory records or information provided by referring facilities); and no evidence of MRSA or VRE during stay in the patient care location (specifically, they are not in Contact Precautions).

Timing of AST: Choose one of two methods for reporting the timing of AST:

Adm = Specimens for AST obtained ≤3 days after admission,
OR
Both = Specimens for AST obtained ≤3 days after admission and, for patients' stays of >3 days, at the time of discharge/transfer. Discharge/transfer AST should include all discharges (including discharges from the facility or to other wards or deaths) and can include the most recent weekly AST if performed >3 days after admission to the patient care location. Discharge/transfer AST should not be performed on patients who tested positive on AST admission.

Numerator and Denominator Data: Use the *MDRO and CDI Monthly Denominator Form* (CDC 57.127) to indicate: 1) AST was performed during the month for MRSA and/or VRE, 2) AST-eligible patients, and 3) the timing of AST. No personal identifiers will be collected or reported. See Tables of Instructions for completion instructions.

Numerator: For each month during which AST is performed:

Admission AST Performed = Number of patients eligible for admission AST who had a specimen obtained for testing ≤3 days after admission,
AND/OR
Discharge/Transfer AST Performed = For patients' stays >3 days, the number of discharged or transferred patients eligible for AST who had a specimen obtained for testing prior to discharge, not including the admission AST.

Denominator: For each month during which AST is performed:

Admission AST Eligible = Number of patients eligible for admission AST (All or NHx),
AND/OR
Discharge/Transfer AST Eligible = Number of patients eligible for discharge/transfer AST (All or NHx) AND in the facility location >3 days AND negative if tested on admission.

Data Analysis: Data are stratified by patient care location and time (for example, month, quarter, etc.), according to AST-eligible patients monitored and the timing of AST.

Admission AST Percent Adherence = Number of patients with admission AST Performed / Number of patients admission AST eligible x 100

Discharge/transfer AST Percent Adherence = Number of patients with discharge/transfer AST performed / Number of patients discharge/transfer AST eligible x 100

2. Active Surveillance Testing Outcome Measures

Introduction: This option will allow facilities to use the results of AST to monitor the prevalent and incident rates of MRSA and/or VRE colonization or infection. This information will assist facilities in assessing the impact of intervention programs on MRSA or VRE transmission.

Settings: Surveillance will occur in any of 4 types of inpatient locations: (1) intensive care units (ICU), (2) specialty care, (3) neonatal intensive care units (NICU), and (4) any other inpatient care location in the institution (for example, surgical wards).

Requirements: Surveillance for prevalent and/or incident MRSA or VRE cases in at least one location in the healthcare facility for at least one calendar month as indicated in the *Patient Safety Monthly Reporting Plan* (CDC 57.106). This can be done ONLY in locations where AST adherence is being performed. A minimum AST adherence level will be required for the system to calculate prevalence and incidence. A facility may choose to report AST for MRSA and/or VRE in one or multiple patient care locations, as the facility deems appropriate. Ideally, this should be done in patient care locations also selected for Infection Surveillance or LabID Event reporting. To improve standardization of timing rules for AST specimen collection, classify admission specimens as those obtained on day 1 (admission date), day 2, or day 3 (specifically, ≤3 days). Classify discharge/transfer AST specimens as those collected on or after day 4 (specifically, >3 days). Only the first specimen positive for MRSA or VRE from a given patient in the patient care location is counted, whether obtained for AST or as part of clinical care. If an Admission AST specimen is not collected from an eligible patient, assume the patient has no MRSA or VRE colonization.

Definitions:

AST Admission Prevalent case:

Known Positive = A patient with documentation on admission of MRSA or VRE colonization or infection in the previous 12 months (specifically, patient is known to be colonized or infected as ascertained by either a facility's laboratory records or information provided by referring facilities). (All MRSA or VRE colonized patients currently in a location during the month of surveillance should be considered "Known Positive"),

OR

Admission AST or Clinical Positive = A patient with MRSA or VRE isolated from a specimen collected for AST ≤3 days after admission or from clinical specimen obtained ≤3 days after admission (specifically, MRSA or VRE cannot be attributed to this patient care location).

AST Incident case: A patient with a stay >3 days:

With no documentation on admission of MRSA or VRE colonization or infection during the previous 12 months (as ascertained either by the facility's laboratory records or information provided by referring facilities); including admission AST or clinical culture obtained ≤3 days after admission (specifically, patient without positive specimen),

AND

With MRSA or VRE isolated from a specimen collected for AST or clinical reasons > 3 days after admission to the patient care location or at the time of discharge/transfer from the patient care location (including discharges from the facility or to other locations or deaths).

MRSA colonization: Carriage of MRSA without evidence of infection (for example, nasal swab test positive for MRSA, without signs or symptoms of infection).

AST Eligible Patients: Choose one of two methods for identifying patients' eligible for AST:

All = All patients in the selected patient care area regardless of history of MRSA or VRE infection or colonization,

OR

NHx = All patients in the selected patient care area who have NO documented positive MRSA or VRE infection or colonization during the previous 12 months (as ascertained either by the facility's laboratory records or information provided by referring facilities); and no evidence of MRSA or VRE during stay in the patient care location.

Timing of AST: Choose one of two methods for reporting the timing of AST:

Adm = Specimens for AST obtained ≤3 days after admission,

OR

Both = Specimens for AST obtained ≤3 days after admission and, for patients' stays of >3 days, at the time of discharge/transfer. Discharge/transfer AST should include all discharges (including discharges from the facility or to other wards or deaths) and can include the most recent weekly AST if performed >3 days after admission to the patient care location. Discharge/transfer AST should not be performed on patients who tested positive on AST admission.

Numerator and Denominator Data: Use the *MDRO and CDI Monthly Denominator Form* (CDC 57.127) to indicate: 1) AST outcomes monitoring and adherence was performed during the month for MRSA and/or VRE, 2) AST eligible patients, and 3) the timing of AST. No personal identifiers will be collected or reported. *See Tables of Instructions* for completion instructions.

If only admission AST is performed, only prevalent cases of MRSA or VRE can be detected in that patient care location. If both admission and discharge/transfer AST are performed, both prevalent and incident cases can be detected. No personal identifiers will be collected or reported.

Admission Prevalent Case:
Numerator Sources: (1) Known Positive; (2) Admission AST or Clinical Positive = Cases ≤3 days after admission
Denominator Source: Total number of admissions

Incident Case:
Numerator: Discharge/transfer AST or Clinical Positive = Cases >3 days after admission and without positive test result(s) on admission

Denominator: Total number of patient days

Note: For research purposes calculating patient-days at risk (specifically, excluding patient-days in which patients were known to be MRSA or VRE colonized or infected) may be a preferable denominator, but for surveillance purposes and ease of aggregating, total number of patient days is required for this module.

Data Analysis: Data are stratified by patient care location and time (for example, month, quarter, etc.) according to the eligible patients monitored and timing of AST.

AST Admission Prevalence rate =
For Eligible patients = All:
Number of admission AST or clinical positive / Number of admissions x 100

For Eligible patients = NHx:
Number of admission AST or clinical positive + Number of known positive / Number of admissions x 100

AST Incidence rate =
Number of discharge/transfer AST or clinical positive / Number of patient days x 1000

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[1]HICPAC, Management of Multidrug-Resistant Organisms in Healthcare Settings. <http://www.cdc.gov/NCIDOD/DHQP/hicpac_pubs.html>.

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[3]McDonald LC, Coignard B, Dubberke E, Song X. Horan T, Kutty PK. Recommendations for surveillance of Clostridium difficile-associated disease. *Infection Control Hospital Epidemiology* 2007; 28:140-5.

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Appendix 1. Guidance for Handling MDRO and CDI Module Infection Surveillance and LabID Event Reporting When Also Following Other NHSN Modules

If a facility is monitoring CLABSIs, CAUTIs, VAPs, or VAEs within the Device-Associated Module and/or SSIs within the Procedure-Associated Module and is also monitoring MDROs (for example, MRSA) in the MDRO and CDI Module, then there are a few situations where reporting the infection or LabID event may be confusing. The following scenarios provide guidance to keep the counts and rates consistent throughout your facility and between all of the NHSN Modules. *These rules apply to the reporting of "Big 5" infections (BSI, UTI, PNEU, VAE, and SSI) caused by an MDRO selected for monitoring.*

Device-Associated Module with MDRO and CDI Module

Scenario 1: Facility is following CLABSI, CAUTI, VAP, or VAE along with MDRO Infection Surveillance and possibly LabID Event Reporting in the same location:
Healthcare-associated Infection identified for this location.

1. Report the infection (BSI, UTI, PNEU, or VAE).
2. Answer "Yes" to the MDRO infection question.

This fulfills the infection reporting requirements of both modules in one entry and lets the NHSN reporting tool know that this infection should be included in both the Device-Associated and the MDRO infection datasets and rates.

3. If following LabID event reporting in the same location, report also (separately) as a LabID Event (if meets the MDRO protocol criteria for LabID event).

Scenario 2: Facility is following BSI (CLABSI), UTI (CAUTI), PNEU/VAP, or VAE along with MDRO Infection Surveillance and possibly LabID Event Reporting in multiple locations:
The event date for the infection is the day of patient transfer from one location (the transferring location) to another location (the new location), or the next day.

1. Report the infection (BSI, UTI, PNEU and VAE) and attribute to the transferring location, if transferring location was following that Event Type (BSI, UTI, PNEU, VAE) on the day of Event, which occurred on the date of transfer, or the following day.
2. Answer "Yes" to the MDRO infection question, if the transferring location was following that MDRO on the day of Event, which occurred on the date of transfer, or the following day.
3. If, on the date of culture collection, the new location is following LabID event reporting, report also (separately) as a LabID Event and attribute to the new location (if meets the MDRO protocol criteria for LabID event).

Procedure-Associated Module with MDRO and CDI Module

Note: SSIs are associated with a procedure and not a patient location, but MDROs are connected with the patient location.

Scenario 3: Facility is following SSI along with MDRO Infection Surveillance and possibly LabID Event Reporting:
Patient has surgery, is transferred to a single unit for the remainder of the stay, and during the current stay acquires an SSI.

1. Report the infection (SSI) and attribute to the post-op location.
2. Answer "Yes" to the MDRO infection question, if the post-op location is following that MDRO during the month of the date of event.
3. If following LabID event reporting in the post-op location, report also (separately) as a LabID Event (if meets the MDRO protocol criteria for LabID event).

Scenario 4: Facility is following SSI along with MDRO Infection Surveillance and possibly LabID Event Reporting:
Patient has surgery, is either discharged immediately (outpatient) or transferred to a unit (inpatient), is discharged, and subsequently is readmitted with an SSI.

1. Report the infection (SSI) and attribute to the discharging (post-op) location (not the readmission location).
2. Answer "Yes" to the MDRO infection question, if the discharging (post-op) location was following that MDRO during the Date of Event.
3. If following LabID event reporting in the readmitting location or outpatient clinic where the specimen was collected, report also (separately) as a LabID Event (if meets the MDRO protocol criteria for LabID event).

Appendix 2: Counts Involving Observation Patients

In response to questions regarding counting "observation" patients, the following guidance is offered.

For the purpose of NHSN surveillance and reporting, an "observation" location (for example, 24-hour observation area) is considered an outpatient unit, and time spent in this type of unit does not ever contribute to any inpatient counts (specifically, patient days, device days, admissions). Stays in such outpatient units represent "encounters" for the purposes of outpatient surveillance for LabID Event monitoring in the MDRO/CDI module.

The NHSN instructions for recording the number of patients in an inpatient unit state that for each day of the month selected, at the same time each day, the number of patients on the unit should be recorded. This procedure should be followed regardless of the patient's admission status as an observation patient or an inpatient.

Key point -- it is the patient's physical location and NOT the patient's admission status as an "observation" patient that determines whether the patient counts for an inpatient location or the 24 hour observation location

1. Observation patient in **observation location**:

   When an observation patient is housed in a location that is mapped as a 24-hr Observation area, they should not be included in any inpatient counts. These areas are considered outpatient locations.

2. Observation patient in **inpatient location:**

   a. If an observation patient is transferred to an inpatient location:

      - LabID event reporting -- Only patient days in the inpatient location are to be included in patient day counts for the location or FacWideIN. These counts should be inclusive of all patients housed in the inpatient location, regardless of their status as an observation patient.

      - Device-associated surveillance -- Device-day denominator data accrue beginning when the patient arrives in any inpatient location where surveillance is occurring, in accordance with the location's device-count methods.

   b. If an observation patient is admitted to an inpatient location, the patient must be included in all surveillance events designated in the monthly reporting plan and included in patient and device day counts. The patient is being housed, monitored, and cared for in an inpatient location and therefore is at risk for acquisition of an HAI. The facility assignment of the patient as an observation patient or an inpatient has no bearing for the purpose of counting.

Below is an example of attributing patient days to a patient admitted to an inpatient location, regardless of whether the facility considers the patient an observation patient or an inpatient.

The examples show counts taken at: A) 12:00 am and B) 11:00 pm.

A. Count at 12:00 am (midnight):

Date	Mr X Pt Day	Mr Y Pt Day
01/01	Mr X admitted at 8:00 pm Mr X not counted because the count for 01/01/10 was taken at 12:00 am on 01/01 10 and he was not yet admitted X	Mr Y admitted at 12:00 am Mr Y is counted because the count for 01/01 was taken at 12:00 am and that is when he was admitted 1
01/02	1	2
01/03	2	3
01/04	3	4
01/05	Mr X discharged at 5:00 pm 4 Counted for 01/05 because he was in the hospital at 12:00 am on 01/05 when the count for that day was taken	Mr Y discharged at 12:01 am 5 Counted for 01/05 because he was in the hospital at 12:00 am on 01/05 when the count for that day was taken
Total	**4 patient days**	**5 patient days**

If we use the same admission dates and times for Mr. X, but a different time is selected for the patient day count, say 11:00 pm, the total number of days in the count will be the same; they will simply be coming from different dates.

B. Count at 11:00 pm:

Date	Mr X	Pt Day
01/01	Mr X admitted at 8:00 am	Counted because the count for 01/01 is taken at 11:00 pm on 01/01 and he is in the hospital at that time 1
01/02		2
01/03		3
01/04		4
01/05	MR X discharged at 5:00 pm	Not counted for 01/05 because he was not in the hospital at 11:00 pm on 01/05 when the count for that day was taken X
Total		**4 patient days**

Determining Admission Counts for Summary Data Collection:

In response to questions regarding how to count number of admissions, the following guidance is offered. How you operationalize this guidance will depend on how you are obtaining the data for your counts.

Recognizing that there are a variety of ways in which patient day and admission counts are obtained for a facility and for specific locations, this guidance is offered to assist with standardization within and across facilities. It is most important that whatever method is used by a facility, it should be used each and every month for consistency of data and metrics.

If admissions are calculated electronically, the data must be checked to ensure that all appropriate patients are included or excluded from those counts and that, for three consecutive months, your electronic data are within +/- 5% of the number obtained by manual counts. If these counts are more than 5% discrepant, then you will need to evaluate and discuss with your IT staff to determine the cause of the discrepancies and methods to address them. The main goal is to accurately count patients in the denominators that may contribute to the numerator.

See below for specific examples:

1. Facility-Wide Inpatient Admission Count: Include any new patients that are assigned to a bed in any inpatient location within the facility regardless of billing status. Qualification as a new patient means that the patient was not present on the previous calendar day. The daily admission counts are summed at the end of the calendar month for a monthly facility-wide inpatient admission count.

2. Inpatient Location-Specific Admission Count: Include any new patients that are assigned to a bed in the specific inpatient location. Qualification as a new patient means that the patient was not present in the

specific inpatient location on the previous calendar day. The daily admission counts are summed at the end of the calendar month for a monthly inpatient location-specific admission count.

Any patient who meets criteria for new inclusion should be counted, regardless of whether they are coded by the facility as an inpatient or as an observation patient.

Below is an example of manually counting location-specific and facility-wide admission counts related to a patient admitted to an inpatient location and transferred to multiple patient locations during his hospital stay. The example show counts taken at 11:00 pm.

Example: Counts at 11:00 pm:

Unit	Date/Time Mr. X Placed on Inpatient Unit	Date/Time Mr. X Transferred Out of Inpatient Unit	Inpatient Location-Specific Admission Count	Inpatient Facility-Wide Admission Count
SICU	10/08 – 10:00am (facility admission)	10/13 – 9:00am	1 Adm for SICU	1 Adm for FacWideIN
MICU	10/13 – 9:15am	10/13 – 11:00am	Not present and so not counted	Same Adm, and also not present so not counted
Surgical Ward	10/13 – 11:30am	10/25 – 1:00pm	1 Adm for Surgical Ward	Same Adm so not counted
Medical Ward	10/25 – 1:30pm	10/26 – 10:00am (facility discharge)	1 Adm for Medical Ward	Same Adm so not counted

Appendix 3: Differentiating Between LabID Event and Infection Surveillance

	LabID Event	Infection Surveillance (using HAI surveillance definitions)
Protocol	LabID Event protocol in Chapter 12 of NHSN manual	Infection Surveillance protocol in Chapter 12 of NHSN manual and HAI site-specific definitions in NHSN manual (for example, BSI, UTI, SSI, PNEU, VAE, and GI-CDI and other HAI definitions)
Signs & Symptoms	NONE. Laboratory and admission data, without clinical evaluation of patient	Combination of laboratory data and clinical evaluation of patient (signs/symptoms)
Surveillance Rules	• HAI and POA do **NOT** apply • Transfer Rule does **NOT** apply • Location = location of patient at time of specimen collection • Event date = specimen collection date	• HAI and POA **do** apply • Transfer Rule applies • See NHSN protocol for details regarding location and date of event
Denominator Reporting	• Number of patient days and admissions • Can be reported by specific location or facility-wide, depending on reporting option(s) selected • Inpatient and/or outpatient	• Device days and patient days must be collected separately for each monitored location • Inpatient reporting only

Categorization of Infections	• Events categorized based on inpatient or outpatient and admission and specimen collection dates
	  • Healthcare Facility-Onset (HO)
	  • Community-Onset (CO)
	  • Community-Onset Healthcare Facility-Associated (CO-HCFA) for *C. difficile* only
	• HO,CO, and CO-HCFA (if applicable) LabID Events must be reported to NHSN
	• Additional categorizations are applied to *C. difficile*, which include Incident CDI event and Recurrent CDI event. Both must be reported to NHSN.
		• HAI protocols used
		• Events are either HAI or not, therefore LabID Event categorizations **do not** apply
		• Only HAIs are reported to NHSN

Plan All-Cause Readmissions (PCR)

SUMMARY OF CHANGES TO HEDIS 2020

- Added definitions of "outlier," "nonoutlier" and "plan population."
- Added observation stays to inpatient admissions.
- Revised direct transfers to include observation discharges.
- Moved instructions for direct transfer to *Guideline 6* in the *Guidelines for Risk Adjusted Utilization Measures*.
- Added steps to remove hospitalizations for outlier members and report a count of outlier members.
- Removed the high-frequency hospitalization stratification for Medicaid.
- Added a step in the Risk Adjustment Weighting section for observation stay IHS.
- Removed the base weight variable from the Risk Adjustment Weighting.
- Removed Sample Table: PCR—Risk Adjustment Weighting in Risk Adjustment Weighting.
- Added a *Note* to step 4 in the numerator.
- Revised the data element tables to combine the 18–64 and 65+ populations.
- Added instructions and data element tables to report plan population and outlier rate.
- Removed the "Total 18-64 Medicare" and "Total 65+ Medicare" rows from Table PCR-B-3 and removed associated footnotes.
- Added instructions and data element tables to report the rate among index stays discharged or transferred to skilled nursing care.

Description

For members 18 years of age and older, the number of acute inpatient and observation stays during the measurement year that were followed by an unplanned acute readmission for any diagnosis within 30 days and the predicted probability of an acute readmission. Data are reported in the following categories:

1. Count of Index Hospital Stays (IHS) (denominator).
2. Count of Observed 30-Day Readmissions (numerator).
3. Count of Expected 30-Day Readmissions.

Note: *For commercial and Medicaid, report only members 18–64 years of age.*

Definitions

IHS	Index hospital stay. An acute inpatient or observation stay with a discharge on or between January 1 and December 1 of the measurement year, as identified in the denominator.
Index Admission Date	The IHS admission date.
Index Discharge Date	The IHS discharge date. The index discharge date must occur on or between January 1 and December 1 of the measurement year.

Index Readmission Stay	An acute inpatient or observation stay for any diagnosis with an admission date within 30 days of a previous Index Discharge Date.
Index Readmission Date	The admission date associated with the Index Readmission Stay.
Planned hospital stay	A hospital stay is considered planned if it meets criteria as described in step 3 (required exclusions) of the *numerator*.
Plan population	Members who meet all of the following criteria: • 18 and older as of January 1 of the measurement year. • Continuously enrolled for at least 395 days, with no more than one gap in enrollment of up to 45 days during the 395-day period, between January 1 of the year prior to the measurement year and December 1 of the measurement year. Assign members to the product and product line at the start of this defined continuous enrollment period.
Outlier	Medicaid and Medicare members in the eligible population with four or more index hospital stays between January 1 and December 1 of the measurement year. Commercial members in the eligible population with three or more index hospital stays between January 1 and December 1 of the measurement year. Assign members who transition between product lines during the measurement year to the product they were enrolled in on January 1 of the measurement year.
Nonoutlier	Members in the plan population who are not considered outliers.
Classification period	365 days prior to and including an Index Discharge Date.

Risk Adjustment Tables

Table	Table Description
HCC-Surg	Surgery codes for Risk Adjustment Determination
PCR-DischCC	Discharge Clinical Condition category codes for Risk Adjustment Determination
CC-Comorbid	Comorbid Clinical Condition category codes for Risk Adjustment Determination step 2
HCC–Rank	HCC rankings for Risk Adjustment Determination step 3
HCC-Comb	Combination HCCs for Risk Adjustment Determination step 5
PCR-MA-DischCC-Weight-Under65	MA and SNP primary discharge weights for Risk Adjustment Weighting step 3 for ages under 65
PCR-MA-DischCC-Weight-65plus	MA and SNP primary discharge weights for Risk Adjustment Weighting step 3 for ages 65 and older

Table	Table Description
PCR-MA-SDischCC-Weight-Under65	MA and SNP primary discharge weights for Risk Adjustment Weighting step 3 for index stays discharged to skilled nursing among ages under 65
PCR-MA-SDischCC-Weight-65plus	MA and SNP primary discharge weights for Risk Adjustment Weighting step 3 for index stays discharged to skilled nursing among ages 65 and older
PCR-Comm-DischCC-Weight	Commercial primary discharge weights for Risk Adjustment Weighting step 3
PCR-MD-DischCC-Weight	Medicaid primary discharge weights for Risk Adjustment Weighting step 3
PCR-MA-ComorbHCC-Weight-Under65	MA and SNP comorbidity weights for Risk Adjustment Weighting step 4 for ages under 65
PCR-MA-ComorbHCC-Weight-65plus	MA and SNP comorbidity weights for Risk Adjustment Weighting step 4 for ages 65 and older
PCR-MA-SComorbHCC-WeightUnder65	MA and SNP comorbidity weights for Risk Adjustment Weighting step 4 for index stays discharged to skilled nursing among ages under 65
PCR-MA-SComorbHCC-Weight-65plus	MA and SNP comorbidity weights for Risk Adjustment Weighting step 4 for index stays discharged to skilled nursing among ages 65 and older
PCR-Comm-ComorbHCC-Weight	Commercial comorbidity weights for Risk Adjustment Weighting step 4
PCR-MD-ComorbHCC-Weight	Medicaid comorbidity weights for Risk Adjustment Weighting step 4
PCR-MA-OtherWeights-Under65	MA and SNP observation stay, surgery, age and gender weights for Risk Adjustment Weighting steps 1, 2, 5 for ages under 65
PCR-MA-OtherWeights-65plus	MA and SNP observation stay, surgery, age and gender weights for Risk Adjustment Weighting steps 1, 2, 5 for ages 65 and older
PCR-MA-SOtherWeights-Under65	MA and SNP observation stay, surgery, age and gender weights for Risk Adjustment Weighting steps 1, 2, 5 for index stays discharged to skilled nursing among ages under 65
PCR-MA-SOtherWeights-65plus	MA and SNP observation stay, surgery, age and gender weights for Risk Adjustment Weighting steps 1, 2, 5 for index stays discharged to skilled nursing among ages 65 and older
PCR-Comm-OtherWeights	Commercial observation stay, surgery, age and gender weights for Risk Adjustment Weighting steps 1, 2, 5
PCR-MD-OtherWeights	Medicaid observation stay, surgery, age and gender weights for Risk Adjustment Weighting steps 1, 2, 5

Note: *The risk adjustment tables will be released on November 1, 2019, and posted to www.ncqa.org.*

Eligible Population

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Refer to General Guideline 10: Reporting for small denominator limits.

Product line Stratification	Commercial, Medicare, Medicaid (report each product line separately). For only Medicare IHS', report the following SES stratifications and total: • Non-LIS/DE, Nondisability. • LIS/DE. • Disability. • LIS/DE and Disability. • Other. • Unknown. • Total Medicare. ***Note:*** *The stratifications are mutually exclusive, and the sum of all six stratifications is the Total population.*
Ages	*For commercial,* ages 18–64 as of the Index Discharge Date. *For Medicare,* ages 18 and older as of the Index Discharge Date. *For Medicaid,* ages 18–64 as of the Index Discharge Date.
Continuous enrollment	365 days prior to the Index Discharge Date through 30 days after the Index Discharge Date.
Allowable gap	No more than one gap in enrollment of up to 45 days during the 365 days prior to the Index Discharge Date and no gap during the 30 days following the Index Discharge Date.
Anchor date	Index Discharge Date.
Benefit	Medical.
Event/diagnosis	An acute inpatient or observation stay discharge on or between January 1 and December 1 of the measurement year. The denominator for this measure is based on discharges, not members. Include all acute inpatient or observation stay discharges for nonoutlier members who had one or more discharges on or between January 1 and December 1 of the measurement year. Follow the steps below to identify acute inpatient and observation stays.

Administrative Specification

Denominator The eligible population.

Step 1 Identify all acute inpatient and observation stay discharges on or between January 1 and December 1 of the measurement year. To identify acute inpatient and observation stay discharges:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set) and observation stays (Observation Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the discharge date for the stay.

Inpatient and observation stays where the discharge date from the first setting and the admission date to the second setting are two or more calendar days apart must be considered distinct stays.

The measure includes acute discharges from any type of facility (including behavioral healthcare facilities).

Step 2 *Direct transfers:* For discharges with one or more direct transfers, use the last discharge.

Using the discharges identified in step 1, identify direct transfers between acute inpatient and observation or between observation and acute inpatient using the definition found in the *Guidelines for Risk Adjusted Utilization Measures.*

Exclude the hospital stay if the direct transfer's discharge date occurs after December 1 of the measurement year.

Step 3 Exclude hospital stays where the Index Admission Date is the same as the Index Discharge Date.

Step 4 Exclude hospital stays for the following reasons:

- The member died during the stay.
- Female members with a principal diagnosis of pregnancy (Pregnancy Value Set) on the discharge claim.
- A principal diagnosis of a condition originating in the perinatal period (Perinatal Conditions Value Set) on the discharge claim.

Note: *For hospital stays where there was a direct transfer (identified in step 2), use the original stay and any direct transfer stays to identify exclusions in this step.*

Step 5 Calculate continuous enrollment.

Step 6 Remove hospital stays for outlier members and report these members as outliers in Table PCR-1/2/3.

Note: *Count discharges with one or more direct transfers (identified in step 2) as one discharge when identifying outlier members.*

Step 7 Assign each remaining acute inpatient or observation stay to an age and stratification category using the reporting instructions below.

Risk Adjustment Determination

For each IHS among nonoutlier members, use the following steps to identify risk adjustment categories based on presence of observation stay status at discharge, surgeries, discharge condition, comorbidity, age and gender.

Observation Stay Determine if the IHS at discharge was an observation stay (Observation Stay Value Set). For direct transfers, determine the hospitalization status using the last discharge.

Surgeries Determine if the member underwent surgery during the stay. Download the list of codes from the NCQA website (Table HCC-Surg) and use it to identify surgeries. Consider an IHS to include a surgery if at least one procedure code in Table HCC-Surg is present from any provider between the admission and discharge dates.

Discharge Condition Assign a discharge Clinical Condition (CC) category code or codes to the IHS based on its primary discharge diagnosis, using Table PCR-DischCC. For direct transfers, use the primary discharge diagnosis from the last discharge. Exclude diagnoses that cannot be mapped to Table PCR-DischCC.

Comorbidities Refer to the *Utilization Risk Adjustment Determination* in the *Guidelines for Risk Adjusted Utilization Measures.*

Risk Adjustment Weighting

For each IHS among nonoutliers, use the following steps to identify risk adjustment weights based on observation stays status at discharge, surgeries, discharge condition, comorbidity, age and gender.

Note: *The final weights table will be released on November 1, 2019, and posted to www.ncqa.org.*

Step 1 For each IHS discharge that is an observation stay, link the observation stay IHS weight.

- *For Medicare product lines ages 18–64:*
  - Use Table PCR-MA-OtherWeights-Under65.
  - Use Table PCR-MA-SOtherWeights-Under65.
- *For Medicare product lines ages 65 and older:*
  - Use Table PCR-MA-OtherWeights-65plus.
  - Use Table PCR-MA-SOtherWeights-65plus.
- *For commercial product lines:* Use Table PCR-Comm-OtherWeights.
- *For Medicaid product lines:* Use Table PCR-MD-OtherWeights.

Step 2 For each IHS with a surgery, link the surgery weight.

- *For Medicare product lines ages 18–64:*
  - Use Table PCR-MA-OtherWeights-Under65.
  - Use Table PCR-MA-SOtherWeights-Under65.
- *For Medicare product lines ages 65 and older:*
  - Use Table PCR-MA-OtherWeights-65plus.
  - Use Table PCR-MA-SOtherWeights-65plus.
- *For commercial product lines:* Use Table PCR-Comm-OtherWeights.
- *For Medicaid product lines:* Use Table PCR-MD-OtherWeights.

Step 3 For each IHS with a discharge CC Category, link the primary discharge weights.

- *For Medicare product lines ages 18–64:*
  - Use Table PCR-MA-DischCC-Weight-Under65.
  - Use Table PCR-MA-SDischCC-Weight-Under65.
- *For Medicare product lines ages 65 and older:*
  - Use Table PCR-MA-DischCC-Weight-65plus.
  - Use Table PCR-MA-SDischCC-Weight-65plus.
- *For commercial product lines:* Use Table PCR-Comm-DischCC-Weight.
- *For Medicaid product lines:* Use Table PCR-MD-DischCC-Weight.

Step 4 For each IHS with a comorbidity HCC Category, link the weights.

- *For Medicare product lines ages 18–64:*
  - Use Table PCR-MA-ComorbHCC-Weight-Under65.
  - Use Table PCR-MA-SComorbHCC-Weight-Under65.
- *For Medicare product lines ages 65 and older:*
  - Use Table PCR-MA-ComorbHCC-Weight-65plus.
  - Use Table PCR-MA-SComorbHCC-Weight-65plus.
- *For commercial product lines:* Use Table PCR-Comm-ComorbHCC-Weight.
- *For Medicaid product lines:* Use Table PCR-MD-ComorbHCC-Weight.

Step 5 Link the age and gender weights for each IHS.

- *For Medicare product lines ages 18–64:*
  - Use Table PCR-MA-OtherWeights-Under65.
  - Use Table PCR-MA-SOtherWeights-Under65.
- *For Medicare product lines ages 65 and older:*
  - Use Table PCR-MA-OtherWeights-65plus.
  - Use Table PCR-MA-SOtherWeights-65plus.
- *For commercial product lines:*
  - Use Table PCR-Comm-OtherWeights.
- *For Medicaid product lines:*
  - Use Table PCR-MD-OtherWeights.

Step 6 Sum all weights associated with the IHS (i.e., observation stay, presence of surgery, primary discharge diagnosis, comorbidities, age and gender) and use the formula below to calculate the Estimated Readmission Risk for each IHS:

$$\text{Estimated Readmission Risk} = \frac{e^{(\sum \text{WeightsForIHS})}}{1+e^{(\sum \text{WeightsForIHS})}}$$

OR

Estimated Readmission Risk = [exp (sum of weights for IHS)] / [1 + exp (sum of weights for IHS)]

Note: *"Exp" refers to the exponential or antilog function.*

Step 7 Calculate the Count of Expected Readmissions for each age and stratification category. The Count of Expected Readmissions is the sum of the Estimated Readmission Risk calculated in step 6 for each IHS in each age and stratification category.

$$Count\ of\ Expected\ Readmissions = \sum (\text{Estimated Readmission Risk})$$

Step 8 Use the formula below and the Estimated Readmission Risk calculated in step 6 to calculate the variance for each IHS.

Variance = Estimated Readmission Risk x (1 – Estimated Readmission Risk)

Example: If the Estimated Readmission Risk is 0.1518450741 for an IHS, then the variance for this IHS is 0.1518450741 x 0.8481549259 = 0.1287881476.

Note: *This variance is calculated at the IHS level. Organizations must sum the variances for each stratification and age when populating the Variance cells in the reporting tables.*

Numerator At least one acute readmission for any diagnosis within 30 days of the Index Discharge Date.

Step 1 Identify all acute inpatient and observation stays with an admission date on or between January 3 and December 31 of the measurement year. To identify acute inpatient and observation admissions:

1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set) and observation stays (Observation Stay Value Set).
2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
3. Identify the admission date for the stay.

Step 2 *Direct transfers:* For discharges with one or more direct transfers, use the last discharge.

Using the discharges identified in step 1, identify direct transfers between acute inpatient and observation or between observation and acute inpatient using the definition found in the *Guidelines for Risk Adjusted Utilization Measures.*.

Step 3 Exclude acute hospitalizations with any of the following criteria on the discharge claim:

- Female members with a principal diagnosis of pregnancy (Pregnancy Value Set).
- A principal diagnosis for a condition originating in the perinatal period (Perinatal Conditions Value Set).
- Planned admissions using any of the following:
  - A principal diagnosis of maintenance chemotherapy (Chemotherapy Encounter Value Set).
  - A principal diagnosis of rehabilitation (Rehabilitation Value Set).
  - An organ transplant (Kidney Transplant Value Set, Bone Marrow Transplant Value Set, Organ Transplant Other Than Kidney Value Set, Introduction of Autologous Pancreatic Cells Value Set).
  - A potentially planned procedure (Potentially Planned Procedures Value Set) without a principal acute diagnosis (Acute Condition Value Set).

Note: *For hospital stays where there was a direct transfer (identified in step 2), use the original stay and any direct transfer stays to identify exclusions in this step.*

Step 4 For each IHS identified in the denominator, determine if any of the acute inpatient and observation stays identified in the numerator have an admission date within 30 days after the Index Discharge Date.

Note: *Count each acute hospitalization only once toward the numerator, for the last denominator event.*

If a single numerator event meets criteria for multiple denominator events, only count the last denominator event. For example, consider the following events:

- *Acute Inpatient Stay 1: May 1–10.*
- *Acute Inpatient Stay 2: May 15–25 (principal diagnosis of maintenance chemotherapy).*
- *Acute Inpatient Stay 3: May 30–June 5.*

All three acute inpatient stays are included as denominator events. Stay 2 is excluded from the numerator because it is a planned hospitalization. Stay 3 is within 30 days of Stay 1 and Stay 2. Count Stay 3 as a numerator event only towards the last denominator event (Stay 2, May 15–25).

Reporting: Number of Members in Plan Population

Step 1 Determine the member's age as of January 1 of the measurement year.

Step 2 Report the count of members in the plan population for each age group and the overall total. Enter these values in reporting Tables PCR-1/2/3.

Reporting: Number of Outliers

Step 1 Determine the member's age as of January 1 of the measurement year.

Step 2 Report the count of outlier members for each age group and the overall total. Enter these values in reporting Tables PCR-1/2/3.

Calculated: Outlier Rate

The number of outlier members divided by the number of members in the plan population, displayed as a permillage (multiplied by 1,000), for each age group and the overall totals calculated by IDSS.

Reporting: Denominator

Count the number of IHS among nonoutlier members for each age group and enter these values into the reporting table under Count of Index Stays.

Reporting: SES Stratification (Medicare only)

Step 1 Determine the member's SES stratifications as of the end of the continuous enrollment period for each Medicare discharge:

- *Non-LIS/DE, Nondisability:* Member is eligible for Medicare due to age only (i.e., does not receive LIS, is not DE for Medicaid, does not have disability status).
- *LIS/DE:* Member is eligible for Medicare due to age and receives LIS (includes members eligible for Medicare due to DE), does not have disability status.
- *Disability*: Member is eligible for Medicare due to disability status only.
- *LIS/DE and Disability:* Member is eligible for Medicare, receives LIS and has disability status.

- *Other:* Member has ESRD-only status or is assigned "9—none of the above."
- *Unknown:* Member's SES is unknown.
- *Total Medicare:* Total of all categories.

Step 2 Report Medicare discharges based on the SES stratification assigned for each Medicare index stay in Table PCR-B-3.

Reporting: Skilled Nursing Care Stratification (Medicare only)

Step 1 For Medicare nonoutlier members, determine if the IHS was discharged or transferred to skilled nursing care (Skilled Nursing Stay Value Set).

An index stay is discharged or transferred to skilled nursing care when the discharge date from the acute inpatient or observation stay precedes the admission date for skilled nursing care by one calendar day or less. For example:

- An index stay discharge on June 1, followed by an admission to a skilled nursing setting on June 1, is an IHS discharged or transferred to skilled nursing care.
- An index stay discharge on June 1, followed by an admission to a skilled nursing setting on June 2, is an IHS discharged or transferred to skilled nursing care.
- An index stay discharge on June 1, followed by an admission to a skilled nursing setting on June 3, is not an IHS discharged or transferred to skilled nursing care.

Step 2 Report Medicare discharges for each IHS discharged or transferred to skilled nursing care to an age group in Table PCR-C-3.

Reporting: Numerator

Count the number of observed IHS among nonoutlier members with a readmission within 30 days of discharge for each age group and enter these values into the reporting tables under Count of Observed 30-Day Readmissions.

Calculated: Observed Readmission Rate

The Count of Observed 30-Day Readmissions divided by the Count of Index Stays calculated by IDSS.

Reporting: Count of Expected 30-Day Readmissions

Step 1 Calculate the Count of Expected Readmissions among nonoutlier members for each age group and overall total.

Step 2 Round to four decimal places using the .5 rule and enter the Count of Expected Readmissions into the reporting tables.

Calculated: Expected Readmission Rate

The Count of Expected 30-Day Readmissions divided by the Count of Index Stays calculated by IDSS.

Reporting: Variance

Step 1 Calculate the total (sum) variance for each SES stratification (Medicare only), skilled nursing stratification (Medicare only) and age group.

Step 2 Round to four decimal places using the .5 rule and enter the variance into the reporting tables.

Calculated: O/E Ratio

The Count of Observed 30-Day Readmissions divided by the Count of Expected 30-Day Readmissions calculated by IDSS.

Note

- *Supplemental data may not be used for this measure.*

Table PCR-1/2/3: Plan Population and Outlier Rate (Medicaid, Commercial and Medicare, 18+)

Age	Members in Plan Population	Outlier Members	Outlier Rate
18-44			
45-54			
55-64			
65-74			
75-84			
85+			
18-64 Total			
65+ Total			

Table PCR-A-1/2/3: Plan All-Cause Readmissions Rates Among Nonoutlier Members by Age (Medicaid, Commercial and Medicare, 18+)

Age	Count of Index Stays	Count of Observed 30-Day Readmissions	Observed Readmission Rate	Count of Expected 30-Day Readmissions	Expected Readmission Rate	Variance	O/E Ratio
18-44							
45-54							
55-64							
65-74							
75-84							
85+							
18-64 Total							
65+ Total							

Table PCR-B-3: Plan All-Cause Readmissions Rates Among Nonoutlier Members by SES Stratification (Medicare, 18+)

SES Stratification	Age	Count of Index Stays	Count of Observed 30-Day Readmissions	Observed Readmission Rate	Count of Expected 30-Day Readmissions	Expected Readmission Rate	Variance	O/E Ratio
Non-LIS/ DE, Non-disability	18-64							
	65+							
LIS/DE	18-64							
	65+							
Disability	18-64							
	65+							
LIS/DE and Disability	18-64							
	65+							
Other	18-64							
	65+							
Unknown	18-64							
	65+							

Table PCR-C-3: Plan All-Cause Readmissions Rates Among Nonoutlier Members Discharged or Transferred to Skilled Nursing Care by Age (Medicare, 18+)

Age	Count of Index Stays	Count of Observed 30-Day Readmissions	Observed Readmission Rate	Count of Expected 30-Day Readmissions	Expected Readmission Rate	Variance	O/E Ratio
18-44							
45-54							
55-64							
65-74							
75-84							
85+							
18-64 Total							
65+ Total							

The MDS 3.0 Rehospitalization Measure (PointRight® Pro 30™provided to AHCA by PointRight) is found on the LTC Trend Tracker report builder screen “AHCA Rehospitalization” report.

The summary below describes how the 30-day skilled nursing facility (SNF) risk-adjusted rehospitalization measure is calculated for each nursing center and how you can interpret your results. Note that all numbers and values used in this document are hypothetical and are for illustrative purposes only.

30-Day Risk-Adjusted SNF Rehospitalization Measure

Numerator: number of individuals sent back to any hospital (excluding ER only visits) from your center within 30 days of admission, as indicated on the MDS discharge assessment (discharge)

Denominator: all residents who were admitted from an acute hospital to your center and had an MDS admission assessment during the prior 12 months

Data Source: MDS 3.0 data submitted to CMS over a 12-month period, using admission assessments (either 5-day SNF PPS or the 14 day OBRA Admission assessment) for the denominator and risk adjustment information and discharge assessments for the numerator

Clinical characteristics included in the risk adjustment: 33 different demographic and clinical variables are included in the adjustment model (see Table 1 below). Some characteristics that may also be associated with an increased risk of rehospitalization are not contained in this list. That is because when combined with the listed characteristics, they do not add to the accuracy of the model. For example “continued use of oxygen” captures individuals with moderate to severe pulmonary diagnoses such as COPD, pulmonary hypertension, etc. These diagnoses are by themselves associated with increased risk of rehospitalization, but when combined with “continued use of oxygen,” they do not add any additional risk or help to explain any more variation than is already captured.

Table 1. Characteristics Included in the Risk Adjustment

Demographic
- Age ≥65
- Male
- Medicare as Primary Payor

Functional Status
- Total Bowel Incontinence
- Eating Dependent
- Needs 2 person assistance in ADLs
- Cognitive impairment (Dementia)

Prognosis
- End Stage prognosis poor
- Recently rehospitalized
- History of respiratory failure
- Receiving Hospice Care

Clinical Condition
- Daily Pain
- Pressure Ulcer Stage (4 variables)
- Venous arterial ulcer
- Diabetic foot ulcer

Diagnoses
- Anemia
- Asthma
- Diabetes
- History of heart failure
- History of sepsis
- History of viral hepatitis
- History of internal bleeding

Services & Treatments
- Dialysis
- Insulin prescribed
- Ostomy Care
- Cancer chemotherapy
- Receiving radiation therapy
- Continue to receive IV medication
- Continue to receive oxygen
- Continued tracheostomy care

Actual rehospitalization rate: is calculated by dividing the number of individuals sent back to any acute care hospital within 30 days of admission to the center by the total number of admissions to the center from acute hospitals. For example, if a center (Brook Creek SNF) admitted 200 individuals to the center from hospitals in the prior 12 months and 50 of them returned to any acute care hospital within 30 days of admission, the center's actual rehospitalization rate would be 50 ÷ 200 = 25.0%. No adjustment is made for any patient characteristics.

Expected rehospitalization rate: logistic regression uses the characteristics listed in Table 1 to calculate the average risk of rehospitalization for patients with similar profiles across the country. For example, hypothetically, women who are >65, with dementia, diabetes, and on insulin and oxygen may have an average rehospitalization rate of 20.6% while men who are ≤65 with a pressure ulcer, who need 2 person assist with ADLs and have a history of sepsis and heart failure may have an average rehospitalization rate of 29.4%. Logistic regression calculates the risk of rehospitalization for each resident based on their risk profile and then sums together each individual's risk to create an expected rehospitalization risk for the center based on the profiles of all its residents. If Brook Creek SNF, for example, has just two residents, each with the clinical characteristics described above (a >65 y.o. women with an average risk of 20.6% and a <65 y.o. man with average risk of 29.4%), the center's expected rehospitalization rate would be (20.6% + 29.4%)/2 = 25.0%.

Risk adjustment method: we use logistic regression (a statistical method that can adjust for multiple clinical characteristics (e.g. age and gender) at the same time. To calculate a center's risk-adjusted rehospitalization rate, their actual rehospitalization rate is divided by their expected rehospitalization rate and the result is multiplied by the national average:

$$\left(\frac{\text{Actual Rehospitalization}}{\text{Expected rehospitalization}}\right) \text{X} \text{ National Average} = \text{Risk Adjusted Rate}$$

This is the same method used by CMS to calculate adjusted staffing for the Five Star rating as well as several of the Quality Measures on Nursing Home Compare. This method has been endorsed by the National Quality Forum (NQF) and is used to calculate the rehospitalization rate that CMS uses to assess payment penalties to hospitals.

Using the example above and a national rehospitalization rate of 18.2%, the adjusted rehospitalization rate for Brook Creek SNF would be 18.2%.

Actual rehospitalization rate ÷ expected rehospitalization rate = (25.0% ÷25.0%) X 18.2 = 18.2

NOTE:

- Using the above formula may not yield the same risk-adjusted rate reported in LTC Trend Tracker due to rounding of the values for your actual, expected, and national average reported in LTC Trend Tracker.
- Risk-adjusted rates are not reported for centers with < 30 admissions in the denominator

National average: The national average is calculated at the national level as the sum of all rehospitalizations divided by the sum of all admissions from hospitals during a calendar year. For example, assume there are only three centers in the country with 100, 200, and 300 admissions respectively (or 600 total admissions) and 10, 20 and 30 rehospitalizations respectively (or 60 total rehospitalizations). The national average would be 60/600 or 10.0%. This average rehospitalization rate is used in the formula above. For example, the second quarter 2012 actual to expected ratio will be multiplied by the 2011 national average. The 2012 national average will be used when the first quarter 2013 actual to expected ratio is reported.

How to Interpret Your Data

When your actual rehospitalization rate is ***equal*** to your expected rate, that means you had the same proportion of hospitalizations that was expected based on your case mix (i.e., the profile of patients in your center) and the average rehospitalization rate across the country for a similar case mix. Therefore, your risk-adjusted rate will equal the national average.

When your actual rehospitalization rate is ***greater*** than your expected rate, that means you had more rehospitalizations than expected based on your case mix (i.e., the profile of patients in your center) and the average rehospitalization rate across the country for a similar case mix. Therefore, your actual to expected ratio will be greater than 1.0, and your adjusted rate will be higher than the national average.

When your actual rehospitalization rate is ***less*** than your expected rate, that means you had fewer rehospitalizations than expected based on your case mix (i.e., the profile of patients in your center) and the average rehospitalization rate across the country for a similar case mix. Therefore, your actual to expected ratio will be less than 1.0 and your adjusted rate will be lower than the national average.

Data completeness: We also examine if data on final discharge status is available for all admissions. If discharge status data is routinely missing in a center, their rehospitalization rate may not be accurate. The completeness rate is calculated as the percentage of admission assessments that have either a discharge assessment or a quarterly, annual or change of status assessment within 120 days of admission. If a particular admission is missing a discharge or quarterly assessment within 120 days, that record is considered incomplete and is dropped from the measure. Overall, the average data completeness rate is 98.5%. The adjusted rehospitalization rate for a center is not reported if the completeness rate is < 95%, since the adjusted rate may not be sufficiently accurate or stable.

Prenatal and Postpartum Care (PPC)

SUMMARY OF CHANGES TO HEDIS 2020

- Revised the timing of the event/diagnosis criteria.
- Revised the *Timeliness of Prenatal Care* numerator to allow for visits that occur before the enrollment start date.
- Revised the timing of the *Postpartum Care* numerator.
- Added a *Definitions* section.
- Revised the *Continuous Enrollment* criteria.
- Added a *Note* to step 1 of the event/diagnosis to clarify that the date of service or, for inpatient claims, the date of discharge is used if the date of delivery cannot be interpreted on the claim.
- Deleted the decision rules and standardized the prenatal care visit requirements in the *Timeliness of Prenatal Care* numerator.
- Clarified in the *Timeliness of Prenatal Care* and *Postpartum Care* numerators to not count visits that occur on the date of delivery.
- Updated the *Postpartum Care* numerator to exclude services provided in an acute inpatient setting.
- Updated the Hybrid specification to indicate that sample size reduction is not allowed.
- Added bullets to the Hybrid Specification of the *Postpartum Care* numerator to meet criteria.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of deliveries of live births on or between October 8 of the year prior to the measurement year and October 7 of the measurement year. For these women, the measure assesses the following facets of prenatal and postpartum care.

- *Timeliness of Prenatal Care.* The percentage of deliveries that received a prenatal care visit in the first trimester, on or before the enrollment start date or within 42 days of enrollment in the organization.
- *Postpartum Care.* The percentage of deliveries that had a postpartum visit on or between 7 and 84 days after delivery.

Definitions

First trimester	280–176 days prior to delivery (or EDD).
Enrollment segment	A period of continuous enrollment with no gaps in enrollment.
Last enrollment segment	The enrollment segment during the pregnancy with the start date that is closest to the delivery date.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines Commercial, Medicaid (report each product line separately).

Age None specified.

Continuous enrollment 43 days prior to delivery through 60 days after delivery.

Allowable gap No allowable gap during the continuous enrollment period.

Anchor date Date of delivery.

Benefit Medical.

Event/diagnosis *Delivered a live birth on or between October 8 of the year prior to the measurement year and October 7 of the measurement year.* Include women who delivered in any setting.

Multiple births. Women who had two separate deliveries (different dates of service) between October 8 of the year prior to the measurement year and October 7 of the measurement year count twice. Women who had multiple live births during one pregnancy count once.

Follow the steps below to identify the eligible population, which is the denominator for both rates.

Step 1 Identify deliveries. Identify all women with a delivery (Deliveries Value Set) on or between October 8 of the year prior to the measurement year and October 7 of the measurement year.

Note: *The intent is to identify the date of delivery (the date of the "procedure"). If the date of delivery cannot be interpreted on the claim, use the date of service or, for inpatient claims, the date of discharge.*

Step 2 Exclude non-live births (Non-live Births Value Set).

Step 3 Identify continuous enrollment. Determine if enrollment was continuous 43 days prior to delivery through 60 days after delivery, with no gaps.

Administrative Specification

Denominator The eligible population.

Numerator

Timeliness of Prenatal Care A prenatal visit during the first trimester, on or before the enrollment start date or within 42 days of enrollment, depending on the date of enrollment in the organization and the gaps in enrollment during the pregnancy.

Step 1 Identify women whose last enrollment segment started before, on or between 280 and 219 days before delivery (or EDD).

These women must have a prenatal visit during the first trimester.

Step 2 Identify women whose last enrollment segment started less than 219 days before delivery (or EDD).

These women must have a prenatal visit any time during the period that begins 280 days prior to delivery and ends 42 days after enrollment start date.

Do not count visits that occur on the date of delivery.

Step 3 Identify prenatal visits that occurred during the required timeframe (the time frame identified in step 1 or 2). Any of the following, where the practitioner type is an OB/GYN or other prenatal care practitioner or PCP, meet criteria for a prenatal visit:

- A bundled service (Prenatal Bundled Services Value Set) where the organization can identify the date when prenatal care was initiated (because bundled service codes are used on the date of delivery, these codes may be used only if the claim form indicates when prenatal care was initiated).
- A visit for prenatal care (Stand Alone Prenatal Visits Value Set).
- A prenatal visit (Prenatal Visits Value Set) ***with*** a pregnancy-related diagnosis code (Pregnancy Diagnosis Value Set).

Postpartum Care A postpartum visit on or between 7 and 84 days after delivery. Any of the following meet criteria:

- A postpartum visit (Postpartum Visits Value Set).
- Cervical cytology (Cervical Cytology Lab Test Value Set; Cervical Cytology Result or Finding Value Set).
- A bundled service (Postpartum Bundled Services Value Set) where the organization can identify the date when postpartum care was rendered (because bundled service codes are used on the date of delivery, not on the date of the postpartum visit, these codes may be used only if the claim form indicates when postpartum care was rendered).

Exclude services provided in an acute inpatient setting (Acute Inpatient Value Set; Acute Inpatient POS Value Set).

Note: *The practitioner requirement only applies to the Hybrid Specification. The organization is not required to identify practitioner type in administrative data.*

Hybrid Specification

Denominator A systematic sample drawn from the eligible population for each product line. Because *Prenatal and Postpartum Care* has been significantly revised, sample size reduction is not allowed.

Numerator

Timeliness of Prenatal Care A prenatal visit in the first trimester, on or before the enrollment start date or within 42 days of enrollment, depending on the date of enrollment in the organization and gaps in enrollment during the pregnancy. Do not count visits that occur on the date of delivery.

Administrative Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record

Prenatal care visit to an OB/GYN or other prenatal care practitioner, or PCP. For visits to a PCP, a diagnosis of pregnancy must be present. Documentation in the medical record must include a note indicating the date when the prenatal care visit occurred, and evidence of *one* of the following.

- A diagnosis of pregnancy.
- A basic physical obstetrical examination that includes auscultation for fetal heart tone, ***or*** pelvic exam with obstetric observations, ***or*** measurement of fundus height (a standardized prenatal flow sheet may be used).
- Evidence that a prenatal care procedure was performed, such as:
  - Screening test in the form of an obstetric panel (must include all of the following: hematocrit, differential WBC count, platelet count, hepatitis B surface antigen, rubella antibody, syphilis test, RBC antibody screen, Rh and ABO blood typing), ***or***
  - TORCH antibody panel alone, ***or***
  - A rubella antibody test/titer with an Rh incompatibility (ABO/Rh) blood typing, ***or***
  - Ultrasound of a pregnant uterus.
- Documentation of LMP, EDD or gestational age in conjunction with *either* of the following.
  - Prenatal risk assessment and counseling/education.
  - Complete obstetrical history.

Postpartum Care

A postpartum visit on or between 7 and 84 days after delivery, as documented through either administrative data or medical record review.

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record

Postpartum visit to an OB/GYN or other prenatal care practitioner, or PCP on or between 7 and 84 days after delivery. Do not include postpartum care provided in an acute inpatient setting.

Documentation in the medical record must include a note indicating the date when a postpartum visit occurred and *one* of the following.

- Pelvic exam.
- Evaluation of weight, BP, breasts and abdomen.
  - Notation of “breastfeeding” is acceptable for the “evaluation of breasts” component.
- Notation of postpartum care, including, but not limited to:
  - Notation of “postpartum care,” “PP care,” “PP check,” “6-week check.”
  - A preprinted “Postpartum Care” form in which information was documented during the visit.
- Perineal or cesarean incision/wound check.
- Screening for depression, anxiety, tobacco use, substance use disorder, or preexisting mental health disorders.
- Glucose screening for women with gestational diabetes.

- Documentation of any of the following topics:
  - Infant care or breastfeeding.
  - Resumption of intercourse, birth spacing or family planning.
  - Sleep/fatigue.
  - Resumption of physical activity and attainment of healthy weight.

Note

- *Criteria for identifying prenatal care for women who were not continuously enrolled during the first trimester allow more flexibility than criteria for women who were continuously enrolled.*
  - *For women whose last enrollment segment started before, on or between 280 and 219 days before delivery, the organization has sufficient opportunity to provide prenatal care by the end of the first trimester.*
  - *For women whose last enrollment segment started less than 219 days before delivery, the organization has sufficient opportunity to provide prenatal care within 42 days after enrollment.*
- *Services that occur over multiple visits count toward this measure if all services are within the time frame established in the measure. Ultrasound and lab results alone are not considered a visit; they must be combined with an office visit with an appropriate practitioner in order to count for this measure.*
- *For each member, the organization must use one date (date of delivery or EDD) to define the start and end of the first trimester. If multiple EDDs are documented, the organization must define a method to determine which EDD to use, and use that date consistently. If the organization elects to use EDD, and the EDD is not on or between October 8 of the year prior to the measurement year and October 7 of the measurement year, the member is excluded as a valid data error and replaced by the next member of the oversample. The LMP may not be used to determine the first trimester.*
- *The organization may use EDD to identify the first trimester for the Timeliness of Prenatal Care rate and use the date of delivery for the Postpartum Care rate.*
- *A Pap test does not count as a prenatal care visit for the administrative and hybrid specification of the Timeliness of Prenatal Care rate, but is acceptable for the Postpartum Care rate as evidence of a pelvic exam. A colposcopy alone is not numerator compliant for either rate.*
- *The intent is that a prenatal visit is with a PCP or OB/GYN or other prenatal care practitioner. Ancillary services (lab, ultrasound) may be delivered by an ancillary provider. Nonancillary services (e.g., fetal heart tone, prenatal risk assessment) must be delivered by the required provider type.*
- *The intent is to assess whether prenatal and preventive care was rendered on a routine, outpatient basis rather than assessing treatment for emergent events.*
- *Refer to Appendix 3 for the definition of PCP and OB/GYN and other prenatal care practitioner.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table PPC-1/2: Data Elements for Prenatal and Postpartum Care

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	*For each of the 2 rates*	*For each of the 2 rates*
Eligible population	*For each of the 2 rates*	*For each of the 2 rates*
Number of numerator events by administrative data in eligible population (before exclusions)		*For each of the 2 rates*
Current year's administrative rate (before exclusions)		*For each of the 2 rates*
Minimum required sample size (MRSS)		*For each of the 2 rates*
Oversampling rate		*For each of the 2 rates*
Number of oversample records		*For each of the 2 rates*
Number of numerator events by administrative data in MRSS		*For each of the 2 rates*
Administrative rate on MRSS		*For each of the 2 rates*
Number of original sample records excluded because of valid data errors		*For each of the 2 rates*
Number of employee/dependent medical records excluded		*For each of the 2 rates*
Records added from the oversample list		*For each of the 2 rates*
Denominator		*For each of the 2 rates*
Numerator events by administrative data	*For each of the 2 rates*	*For each of the 2 rates*
Numerator events by medical records		*For each of the 2 rates*
Reported rate	*For each of the 2 rates*	*For each of the 2 rates*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Prenatal and Postpartum Care

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	NA	There are no ages specified in this measure.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	Yes, with limits	Only events that contain (or map to) codes in the value sets may be used to identify visits. The value sets and logic may not be changed. Organizations may not change the logic but may change the delivery date and account for the impact on other date-dependent events. ***Note:*** *Organizations may assess at the member level (vs. discharge level) by applying measure logic appropriately (i.e., percentage of members with deliveries).*
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	Yes	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• Timeliness of Prenatal Care • Postpartum Care	No	Value sets and logic may not be changed. If the delivery-date range is changed, all numerator events must be measured in relation to the new range.

Quality ID #134 (NQF 0418): Preventive Care and Screening: Screening for Depression and Follow-Up Plan
– National Quality Strategy Domain: Community/Population Health
– Meaningful Measure Area: Prevention, Treatment, and Management of Mental Health

2019 COLLECTION TYPE:
MIPS CLINICAL QUALITY MEASURES (CQMS)

MEASURE TYPE:
Process

DESCRIPTION:
Percentage of patients aged 12 years and older screened for depression on the date of the encounter using an age appropriate standardized depression screening tool AND if positive, a follow-up plan is documented on the date of the positive screen

INSTRUCTIONS:
This measure is to be submitted a minimum of **once per measurement period** for patients seen during the measurement period. The most recent quality-data code submitted will be used for performance calculation. This measure may be submitted by Merit-based Incentive Payment System (MIPS) eligible clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding. The follow-up plan must be related to a positive depression screening, example: "Patient referred for psychiatric evaluation due to positive depression screening".

Measure Submission Type:
Measure data may be submitted by individual MIPS eligible clinicians, groups, or third party intermediaries. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure. The quality-data codes listed do not need to be submitted by MIPS eligible clinicians, groups, or third party intermediaries that utilize this modality for submissions; however, these codes may be submitted for those third party intermediaries that utilize Medicare Part B claims data. For more information regarding Application Programming Interface (API), please refer to the Quality Payment Program (QPP) website.

DENOMINATOR:
All patients aged 12 years and older at the beginning of the measurement period with at least one eligible encounter during the measurement period

> ***DENOMINATOR NOTE:*** **Signifies that this CPT Category I code is a non-covered service under the Medicare Part B Physician Fee Schedule (PFS). These non-covered services should be counted in the denominator population for MIPS CQMs.*
>
> **Denominator Criteria (Eligible Cases):**
> Patients aged ≥ 12 years on date of encounter
> **AND**
> **Patient encounter during the performance period (CPT or HCPCS):** 59400, 59510, 59610, 59618, 90791, 90792, 90832, 90834, 90837, 92625, 96116, 96121, 96130, 96131, 96132, 96133, 96136, 96137, 96138, 96139, 96146, 96150, 96151, 97165, 97166, 97167, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99304, 99305, 99306, 99307, 99308, 99309, 99310, 99315, 99316, 99318, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99339, 99340, 99483, 99484, 99492, 99493, 99384*, 99385*, 99386*, 99387*, 99394*, 99395*, 99396*, 99397*, G0101, G0402, G0438, G0439, G0444
> **AND NOT**
> **DENOMINATOR EXCLUSION:**

Documentation stating the patient has an active diagnosis of depression or has a diagnosed bipolar disorder, therefore screening or follow-up not required: G9717

NUMERATOR:
Patients screened for depression on the date of the encounter using an age appropriate standardized tool AND, if positive, a follow-up plan is documented on the date of the positive screen

Definitions:
Screening – Completion of a clinical or diagnostic tool used to identify people at risk of developing or having a certain disease or condition, even in the absence of symptoms.
Standardized Depression Screening Tool – A normalized and validated depression screening tool developed for the patient population in which it is being utilized. The name of the age appropriate standardized depression screening tool utilized must be documented in the medical record.
Examples of depression screening tools include but are not limited to:

- **Adolescent Screening Tools (12-17 years)**
  Patient Health Questionnaire for Adolescents (PHQ-A), Beck Depression Inventory-Primary Care Version (BDI-PC), Mood Feeling Questionnaire (MFQ), Center for Epidemiologic Studies Depression Scale (CES-D), Patient Health Questionnaire (PHQ-9), Pediatric Symptom Checklist (PSC-17), and PRIME MD-PHQ2
- **Adult Screening Tools (18 years and older)**
  Patient Health Questionnaire (PHQ-9), Beck Depression Inventory (BDI or BDI-II), Center for Epidemiologic Studies Depression Scale (CES-D), Depression Scale (DEPS), Duke Anxiety-Depression Scale (DADS), Geriatric Depression Scale (GDS), Cornell Scale or Depression in Dementia (CSDD), PRIME MD-PHQ2, Hamilton Rating Scale for Depression (HAM-D), Quick Inventory of Depressive Symptomatology Self-Report (QID-SR), Computerized Adaptive Testing Depression Inventory (CAT-DI), and Computerized Adaptive Diagnostic Screener (CAD-MDD)
- **Perinatal Screening Tools**
  Edinburgh Postnatal Depression Scale, Postpartum Depression Screening Scale, Patient Health Questionnaire 9 (PHQ-9), Beck Depression Inventory, Beck Depression Inventory–II, Center for Epidemiologic Studies Depression Scale, and Zung Self-rating Depression Scale

Follow-Up Plan – Documented follow-up for a positive depression screening ***must*** include one or more of the following:

- Additional evaluation or assessment for depression
- Suicide Risk Assessment
- Referral to a practitioner who is qualified to diagnose and treat depression
- Pharmacological interventions
- Other interventions or follow-up for the diagnosis or treatment of depression

Examples of a follow-up plan include but are not limited to:
* Additional evaluation or assessment for depression such as psychiatric interview, psychiatric evaluation, or assessment for bipolar disorder
* Completion of any Suicide Risk Assessment such as Beck Depression Inventory or Beck Hopelessness Scale
* Referral to a practitioner or program for further evaluation for depression, for example, referral to a psychiatrist, psychologist, social worker, mental health counselor, or other mental health service such as family or group therapy, support group, depression management program, or other service for treatment of depression
* Other interventions designed to treat depression such as psychotherapy, pharmacological interventions, or additional treatment options
* Pharmacologic treatment for depression is often indicated during pregnancy and/or lactation. Review and discussion of the risks of untreated versus treated depression is advised. Consideration of each patient's

prior disease and treatment history, along with the risk profiles for individual pharmacologic agents, is important when selecting pharmacologic therapy with the greatest likelihood of treatment effect.

Not Eligible for Depression Screening or Follow-Up Plan (Denominator Exclusion) –

- Patient has an active diagnosis of depression prior to any encounter during the measurement period - F01.51, F32.0, F32.1, F32.2, F32.3, F32.4, F32.5, F32.89, F32.9, F33.0, F33.1, F33.2, F33.3, F33.40, F33.41, F33.42, F33.8, F33.9, F34.1, F34.81, F34.89, F43.21, F43.23, F53.0, F53.1, O90.6, O99.340, O99.341, O99.342, O99.343, O99.345
- Patient has a diagnosed bipolar disorder prior to any encounter during the measurement period - F31.10, F31.11, F31.12, F31.13, F31.2, F31.30, F31.31, F31.32, F31.4, F31.5, F31.60, F31.61, F31.62, F31.63, F31.64, F31.70, F31.71, F31.72, F31.73, F31.74, F31.75, F31.76, F31.77, F31.78, F31.81, F31.89, F31.9

Patients with a Documented Reason for not Screening for Depression (Denominator Exception) –
One or more of the following conditions are documented:

- Patient refuses to participate
- Patient is in an urgent or emergent situation where time is of the essence and to delay treatment would jeopardize the patient's health status
- Situations where the patient's functional capacity or motivation to improve may impact the accuracy of results of standardized depression assessment tools. For example: certain court appointed cases or cases of delirium

Numerator Instructions:
A depression screen is completed on the date of the encounter using an age appropriate standardized depression screening tool AND if positive, either additional evaluation for depression, suicide risk assessment, referral to a practitioner who is qualified to diagnose and treat depression, pharmacological interventions, or other interventions or follow-up for the diagnosis or treatment of depression a follow-up plan is documented on the date of the positive screen. Depression screening is required once per measurement period, not at all encounters; this is patient based and not an encounter based measure. The name of the age appropriate standardized depression screening tool utilized must be documented in the medical record. The depression screening must be reviewed and addressed in the office of the provider filing the code on the date of the encounter and the screening should occur during a qualified encounter.

Numerator Options:

Performance Met:	Screening for depression is documented as being positive AND a follow-up plan is documented **(G8431)**
OR	
Performance Met:	Screening for depression is documented as negative, a follow-up plan is not required **(G8510)**
OR	
Denominator Exception:	Screening for depression not completed, documented reason **(G8433)**
OR	
Performance Not Met:	Depression screening not documented, reason not given **(G8432)**
OR	
Performance Not Met:	Screening for depression documented as positive, follow-up plan not documented, reason not given **(G8511)**

RATIONALE:
Depression is a serious medical illness associated with higher rates of chronic disease increased health care utilization, and impaired functioning (Pratt, Brody 2014). 2014 U.S. survey data indicate that 2.8 million (11.4 percent) adolescents aged 12 to 17 had a major depressive episode (MDE) in the past year and that 15.7 million (6.6 percent) adults aged 18 or older had at least one MDE in the past year, with 10.2 million adults (4.3 percent) having one MDE with severe

impairment in the past year (Center for Behavioral Health Statistics and Quality, 2015). Data indicate that severity of depressive symptoms factor into having difficulty with work, home, or social activities. For example, as the severity of depressive symptoms increased, rates of having difficulty with work, home, or social activities related to depressive symptoms increased. For those twelve and older with mild depressive symptoms, 45.7% reported difficulty with activities and those with severe depressive symptoms, 88.0% reported difficulty (Pratt & Brody, 2014). Children and teens with, major depressive disorder (MDD) has been found to have difficulty carrying out their daily activities, relating to others, and growing up healthy with an increased risk of suicide (Siu and USPSTF, 2016). Additionally, among pregnant women, especially during the perinatal period, depression and other mood disorders, such as bipolar disorder and anxiety disorders, can have devastating effects on women, infants, and families. Maternal suicide rates rise over hemorrhage and hypertensive disorders as a cause of maternal mortality (American College of Obstetricians and Gynecologists, 2015).

Negative outcomes associated with depression make it crucial to screen in order to identify and treat depression in its early stages. While Primary Care Providers (PCPs) serve as the first line of defense in the detection of depression, studies show that PCPs fail to recognize up to 50% of depressed patients (Borner, 2010, p. 948). "Coyle et al. (2003), suggested that the picture is more grim for adolescents, and that more than 70% of children and adolescents suffering from serious mood disorders go unrecognized or inadequately treated" (Borner, 2010, p. 948). “In nationally representative U.S. surveys, about 8% of adolescents reported having major depression in the past year. Only 36% to 44% of children and adolescents with depression receive treatment, suggesting that the majority of depressed youth are undiagnosed and untreated” (Sui, A. and USPSTF, 2016). Evidence supports that screening for depression in pregnant and postpartum women is of moderate net benefit and treatment options for positive depression screening should be available for patients twelve and older including pregnant and postpartum women.

If preventing negative patient outcomes is not enough, the substantial economic burden of depression for individuals and society alike makes a case for screening for depression on a regular basis. Depression imposes economic burden through direct and indirect costs. “In the United States, an estimated $22.8 billion was spent on depression treatment in 2009, and lost productivity cost an additional estimated $23 billion in 2011” (Sui, A. and USPSTF, 2016).

This measure seeks to align with clinical guideline recommendations as well as the Healthy People 2020 recommendation for routine screening for mental health problems as a part of primary care for both children and adults (U.S. Department of Health and Human Services, 2014) and makes an important contribution to the quality domain of community and population health.

CLINICAL RECOMMENDATION STATEMENTS:

Adolescent Recommendation (12-18 years)

“The USPSTF recommends screening for MDD in adolescents aged 12 to 18 years. Screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up (B recommendation)” (Sui, A. and USPSTF, 2016, p. 360).

“Clinicians and health care systems should try to consistently screen adolescents ages 12-18 for major depressive disorder, but only when systems are in place to ensure accurate diagnosis, careful selection of treatment, and close follow-up” (ICSI, 2013, p.16).

Adult Recommendation (18 years and older)

“The USPSTF recommends screening for depression in the general adult population, including pregnant and postpartum women. Screening should be implemented with adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up (B recommendation)” (Sui, A. and USPSTF, 2016, p. 380).

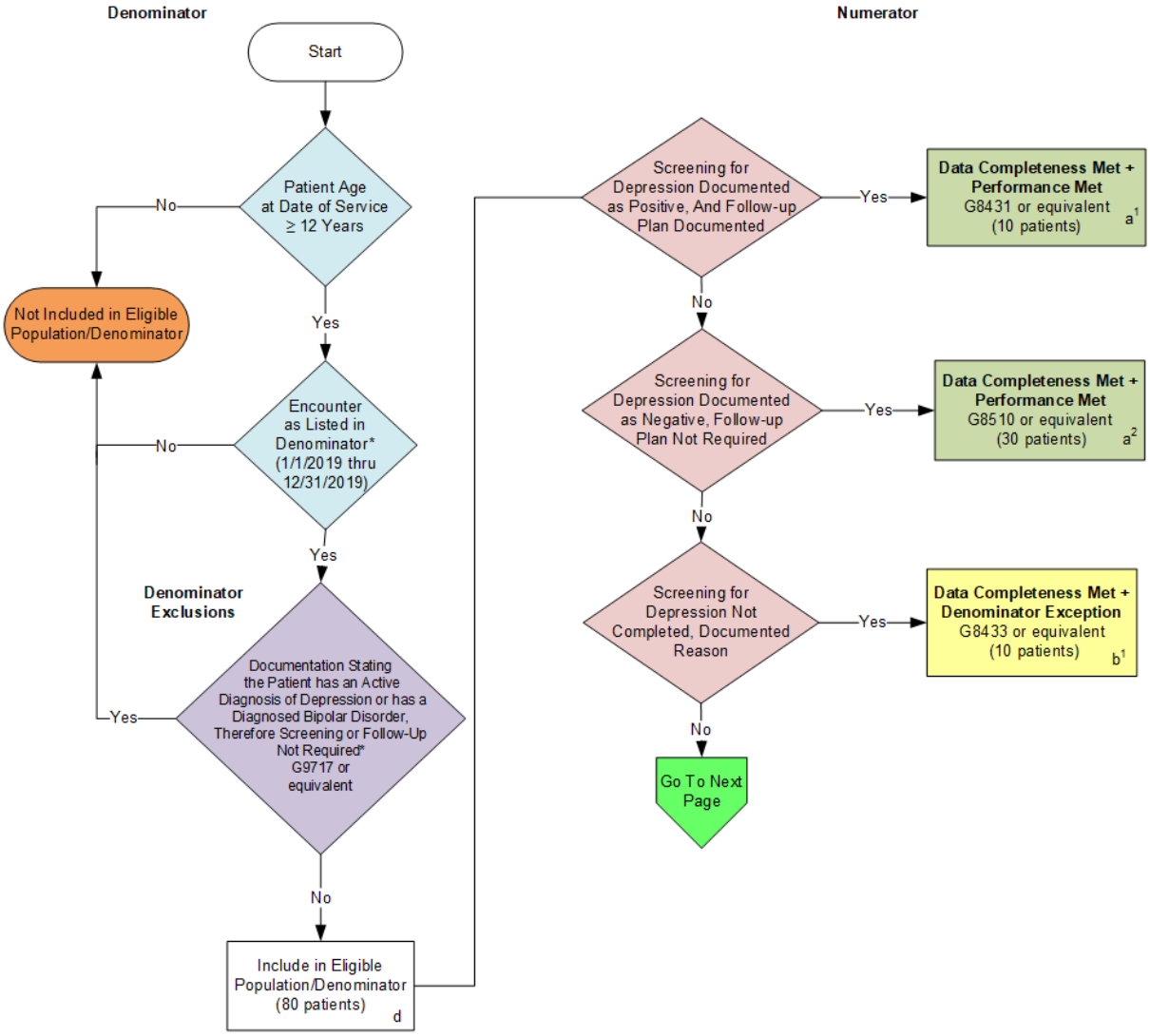
The Institute for Clinical Systems Improvement (ICSI) health care guideline, Adult Depression in Primary Care, provides the following recommendations:

1. “Clinicians should routinely screen all adults for depression using a standardized instrument.”

2. “Clinicians should establish and maintain follow-up with patients.”

3. “Clinicians should screen and monitor depression in pregnant and post-partum women.” (Trangle, 2016 p.p. 9 – 10)

2019 Clinical Quality Measure Flow for Quality ID #134 NQF #0418: Preventive Care and Screening: Screening for Depression and Follow-Up Plan

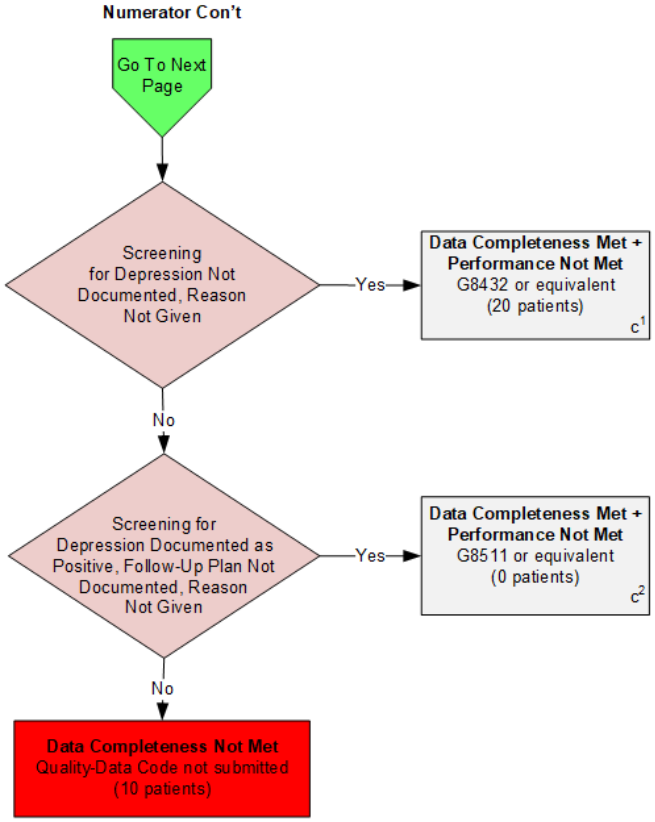


*See the posted Measure Specification for specific coding and instruction to submit this measure.

NOTE: Submission Frequency: Patient-process

v3

2019 Clinical Quality Measure Flow for Quality ID #134 NQF #0418: Preventive Care and Screening: Screening for Depression and Follow-Up Plan



SAMPLE CALCULATIONS:

Data CompletenessRate=

Performance Met (a^1+a^2=40 patients) + Denominator Exception (b^1=10 patients) + Performance Not Met (c^1+c^2=20 patients) = 70 patients = **87.50%**

Eligible Population / Denominator (d=80 patients) = 80 patients

Performance Rate=

Performance Met (a^1+a^2=40 patients) = 40 patients = **66.67%**

Data Completeness Numerator (70 patients) - Denominator Exception (b^1=10 patients) = 60 patients

*See the posted Measure Specification for specific coding and instruction to submit this measure.

NOTE: Submission Frequency: Patient-process

v3

2019 Clinical Quality Measure Flow Narrative for Quality ID #134 NQF #0418: Preventative Care and Screening: Screening for Depression and Follow-Up Plan

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specification.

1. Start with Denominator
2. Check Patient Age:
    a. If the Patient Age is greater than or equal to 12 Years on Date of Service equals No during the measurement period, do not include in Eligible Population. Stop Processing.
    b. If the Patient Age is greater than or equal to 12 Years on Date of Service equals Yes during the measurement period, proceed to check Encounter Performed.
3. Check Encounter Performed:
    a. If Encounter as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.
    b. If Encounter as Listed in the Denominator equals Yes, proceed to check Documentation Stating the Patient has an Active Diagnosis of Depression or has a Diagnosed Bipolar Disorder, Therefore Screening or Follow-Up Not Required*.
4. Check Documentation Stating the Patient has an Active Diagnosis of Depression or has a Diagnosed Bipolar Disorder, Therefore Screening or Follow-Up Not Required*:
    a. If Documentation Stating the Patient has an Active Diagnosis of Depression or has a Diagnosed Bipolar Disorder, Therefore Screening or Follow-up Not Required equals Yes, do not include in Eligible Population. Stop Processing
    b. If Documentation Stating the Patient has an Active Diagnosis of Depression or has a Diagnosed Bipolar Disorder, Therefore Screening or Follow-up Not Required equals No, include in Eligible Population.
5. Denominator Population:
    a. Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 80 patients in the Sample Calculation.
6. Start Numerator
7. Check Screening for Depression Documented as Positive, And Follow-up Plan Documented:
    a. If Screening for Depression Documented as Positive, And Follow-up Plan Documented equals Yes, include in Data Completeness Met and Performance Met.
    b. Data Completeness Met and Performance Met letter is represented as Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^1 equals 10 patients in the Sample Calculation.
    c. If Screening for Depression Documented as Positive, And Follow-up Plan Documented equals No, proceed to check Screening for Depression Documented as Negative, Follow-up Plan Not Required.
8. Check Screening for Depression Documented as Negative, Follow-up Plan Not Required:

a. If Screening for Depression Documented as Negative, Follow-up Plan Not Required equals Yes, include in Data Completeness Met and Performance Met.

b. Data Completeness Met and Performance Met letter is represented as Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^2 equals 30 patients in the Sample Calculation.

c. If Screening for Depression Documented as Negative, Follow-up Plan Not Required equals No, proceed to check Screening for Depression Not Completed, Documented Reason.

9. Check Screening for Depression Not Completed, Documented Reason:

   a. If Screening for Depression Not Completed, Documented Reason equals Yes, include in the Data Completeness Met and Denominator Exception.

   b. Data Completeness Met and Denominator Exception letter is represented as Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter b^1 equals 10 patients in the Sample Calculation.

   c. If Screening for Depression Not Completed, Documented Reason equals No, proceed to check Screening for Depression Not Documented, Reason Not Given.

10. Check Screening for Depression Not Documented, Reason Not Given:

    a. If Screening for Depression Not Documented, Reason Not Given equals Yes, include in the Data Completeness Met and Performance Not Met.

    b. Data Completeness Met and Performance Not Met letter is represented as Data Completeness in the Sample Calculation listed at the end of this document. Letter c^1 equals 20 patients in the Sample Calculation.

    c. If Screening for Depression Not Documented, Reason Not Given equals No, proceed to check Screening for Depression Documented as Positive, Follow-Up Plan Not Documented, Reason Not Given.

11. Check Screening for Depression Documented as Positive, Follow-Up Plan Not Documented, Reason Not Given:

    a. If Screening for Depression Documented as Positive, Follow-Up Plan Not Documented, Reason Not Given equals Yes, include in the Data Completeness Met and Performance Not Met.

    b. Data Completeness Met and Performance Not Met letter is represented as Data Completeness in the Sample Calculation listed at the end of this document. Letter c^2 equals 0 patients in the Sample Calculation.

    c. If Screening for Depression Documented as Positive, Follow-Up Plan Not Documented, Reason Not Given equals No, proceed to check Data Completeness Not Met.

12. Check Data Completeness Not Met:

    a. If Data Completeness Not Met, the Quality Data Code or equivalent was not submitted. 10 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

SAMPLE CALCULATIONS:

Data CompletenessRate=

$$\frac{\text{Performance Met } (a^1+a^2=40 \text{ patients}) + \text{Denominator Exception } (b^1=10 \text{ patients}) + \text{Performance Not Met } (c^1+c^2=20 \text{ patients})}{\text{Eligible Population / Denominator } (d=80 \text{ patients})} = \frac{70 \text{ patients}}{80 \text{ patients}} = \mathbf{87.50\%}$$

Performance Rate=

$$\frac{\text{Performance Met } (a^1+a^2=40 \text{ patients})}{\text{Data Completeness Numerator (70 patients) - Denominator Exception } (b^1=10 \text{ patients})} = \frac{40 \text{ patients}}{60 \text{ patients}} = \mathbf{66.67\%}$$

March 2015

Skilled Nursing Facility Readmission Measure (SNFRM) NQF #2510: All-Cause Risk-Standardized Readmission Measure

Draft Technical Report

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RTI INTERNATIONAL

SKILLED NURSING FACILITY READMISSION MEASURE (SNFRM) NQF #2510: ALL-CAUSE RISK-STANDARDIZED READMISSION MEASURE
DRAFT TECHNICAL REPORT

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RTI International

CMS Contract No. HHSM-500- 2013-13015I Task Order HHSM-500-T0001

March 2015

This project was funded by the Centers for Medicare & Medicaid Services under contract no. 500-00-1234. The statements contained in this report are solely those of the authors and do not necessarily reflect the views or policies of the Centers for Medicare & Medicaid Services. RTI assumes responsibility for the accuracy and completeness of the information contained in this report.

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SECTION 1
INTRODUCTION

Hospital readmissions of Medicare beneficiaries discharged from a hospital to a skilled nursing facility (SNF) are common, and prior studies suggest that a large proportion of readmissions are preventable (Mor et al., 2010). Hospital readmissions also put beneficiaries at risk for complications (Ouslander et al., 2011). Analyses suggest there is opportunity for reducing hospital readmissions among SNF patients (Li et al., 2012; Mor et al., 2010), and multiple studies suggest SNF structural and process characteristics impact readmission rates (Coleman et al., 2004; MedPAC, 2011).

There are significant geographic differences in hospital readmission rates for SNF patients. Across the 50 states, readmission rates range from a low of 15.1 percent in Utah to a high of 28.1 percent in Mississippi. Within that range, nine states have readmission rates below 17 percent, and nine states have rates above 25 percent (Mor et al., 2010). These differences are not aligned with income: the state with the highest 2006 median income, New Jersey, has a readmission rate of 26.1 percent, while the poorest state, Mississippi, has a similarly high readmission rate of 28.1 percent (Mor et al., 2010).

In addition to geographic variation, readmission rates vary by facility characteristics. Facility characteristics that increase the likelihood of readmission include larger bed size, free-standing status (as opposed to hospital-based SNFs), a higher percentage of Medicaid patients, and for-profit status (Li et al., 2012). More hours per resident day of registered nurses, licensed practical nurses, and certified nurse aides are associated with a decrease in the rate of potentially avoidable readmissions (MedPAC 2011).

Hospital readmissions from SNFs are also expensive. According to Mor et al. (2010), based on an analysis of SNF data from 2006 Medicare claims merged with the Minimum Data Set (MDS), 23.5 percent of SNF stays resulted in a rehospitalization within 30 days of the initial hospital discharge. The average Medicare payment for each readmission was $10,352 per hospitalization, for a total of $4.34 billion. Of these rehospitalizations, 78 percent were deemed potentially avoidable. Applying this figure to the aggregate cost indicates that avoidable hospitalizations resulted in an excess cost of $3.39 billion (78 percent of $4.34 billion) to Medicare (Mor et al., 2010).

In an analysis of the 2008 MDS and the Online, Survey, Certification, and Reporting file, Li and colleagues (2012) found that hospital readmission rates varied by patient volume, with a 16.4 percent readmission rate for low-volume SNFs (≤45 annual SNF admissions), 15.9 percent for medium-volume SNFs (45–107 annual SNF admissions), and 14.3 percent for high-volume SNFs (≥108 annual SNF admissions) ($p<0.0001$). In addition to being costly, readmission to the hospital interrupts the SNF patient's therapy and care plan, causes anxiety and discomfort, and exposes the patient to hospital-acquired adverse events such as loss of functional status, health-care-associated infections, and medication errors (Covinsky et al., 2003; Boockvar et al., 2004; Ouslander et al., 2011).

In response to these issues, the Centers for Medicare & Medicaid Services (CMS) contracted with RTI International to develop the Skilled Nursing Facility 30-Day All-Cause

Readmission Measure (SNFRM). The goal of this measure is to measure facility-level readmission rates among beneficiaries utilizing SNF. This measure was designed using fee-for-service (FFS) Medicare claims and harmonizes with CMS's current Hospital-Wide All-Cause Unplanned Readmission Measure (HWR) measure (National Quality Forum [NQF] #1789) and readmission measures being developed for other post-acute care (PAC) settings (e.g.., inpatient rehabilitation facilities [IRF], long-term care hospitals [LTCH], home health agencies, and end-stage renal dialysis [ESRD] facilities). The harmonization is intended to promote shared accountability and to improve care transitions across all settings.

The intent of the SNFRM is to encourage SNF providers to monitor and reduce hospital readmissions, thereby reducing costs and improving the quality of care Medicare beneficiaries receive during their SNF stay. For example, SNF providers may use the SNFRM to track their readmissions to the hospital to enhance internal quality improvement efforts. Public reporting of this measure will provide information about facilities' readmission rates, allowing beneficiaries and their families to make informed choices about their SNF care. The SNFRM was endorsed by the NQF in December 2014.

This report summarizes the measure development and details the technical specifications, including the risk-adjustment models developed for the SNFRM and results of reliability and validity testing. Specifically, ***Section 2*** reports the methods used, including an overview of the measure and definitions of outcomes and eligible admissions, the inclusion/exclusion criteria, model development, data sources, risk adjustment, and statistical approaches. ***Section 3*** summarizes analytic results for this measure including model validation, reliability and validity testing, and results of bootstrapping to estimate confidence intervals for facilities' readmission rates. ***Section 4***, the final section, details the current status of this measure and provides a summary.

SECTION 2
MEASURE DEVELOPMENT

2.1 Measure Overview

The SNFRM estimates the risk-standardized rate of all-cause, unplanned hospital readmissions for SNF Medicare FFS beneficiaries within 30 days of discharge from their prior proximal short-stay acute hospital discharge. The SNF admission must have occurred within 1 day after discharge from the prior proximal hospital stay. The prior proximal hospital stay is defined as an inpatient admission to an inpatient prospective payment system (IPPS) hospital, critical access hospital (CAH), or PPS-exempt psychiatric or cancer hospitals. This measure is based on data for 12 months of SNF admissions. Because the measure denominator is based on SNF admissions, it is possible that Medicare beneficiaries with more than one eligible admission may be included in the measure multiple times within a given year.

The SNFRM excludes certain SNF stays. Specifically, the SNFRM excludes SNF stays for which the patient had one or more intervening PAC admissions occurring either between the prior proximal hospital discharge and SNF admission or after the SNF discharge. To ensure sufficient time to observe patient comorbidities, the measure excludes those who did not have at least 12 months of FFS Part A Medicare enrollment before the proximal hospital discharge. Additionally, the measure excludes patients who did not have FFS Part A Medicare enrollment for the entire 30-day risk window. The measure also excludes patients whose prior proximal hospitalization was for the medical (nonsurgical) treatment of cancer or who were receiving rehabilitation care or prostheses fitting. SNF stays in which the patients was discharged from the SNF against medical advice are also excluded.

We used the Agency for Healthcare Research and Quality (AHRQ) Clinical Classification System (CCS) single-level codes to categorize patients' primary reason for their prior proximal hospitalization. The CCS collapses more than 14,000 diagnosis codes and 4,000 procedure codes from the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) into a clinically meaningful, mutually exclusive set of 280 condition categories and 231 procedure categories (HCUP CCS, 2015).

The SNFRM produces a risk-adjusted readmission rate for each facility, excluding planned readmissions from the SNF. The measure is computed by calculating the standardized risk ratio (SRR): the predicted number of readmissions at the facility divided by the expected number of readmissions for the same patients if these patients had been treated at the average SNF. The magnitude of the risk-standardized ratio is the indicator of a facility's effect on readmission rates. After computing the SRR, the SRR is then multiplied by the mean rate of readmission in the population (i.e., all Medicare FFS patients included in the measure) to generate the facility-level standardized readmission rate, referred to as the Risk-Standardized Readmission Rate or RSRR.

The SNFRM measure specifications are designed to harmonize with CMS's Hospital-Wide All-Cause Unplanned Readmission (HWR) measure to the greatest extent possible. The HWR (NQF #1789) estimates the hospital-level, risk-standardized rate of unplanned, all-cause readmissions within 30 days of a hospital discharge (Horwitz et al., 2012) and uses the same 30-

day risk window as the SNFRM. There are many methodological similarities in the two measures.

2.2 Outcome Definition

This measure is designed to capture the outcome of unplanned all-cause hospital readmissions (IPPS or CAH) of SNF patients occurring within 30 days of discharge from the patient's prior proximal acute hospitalization.

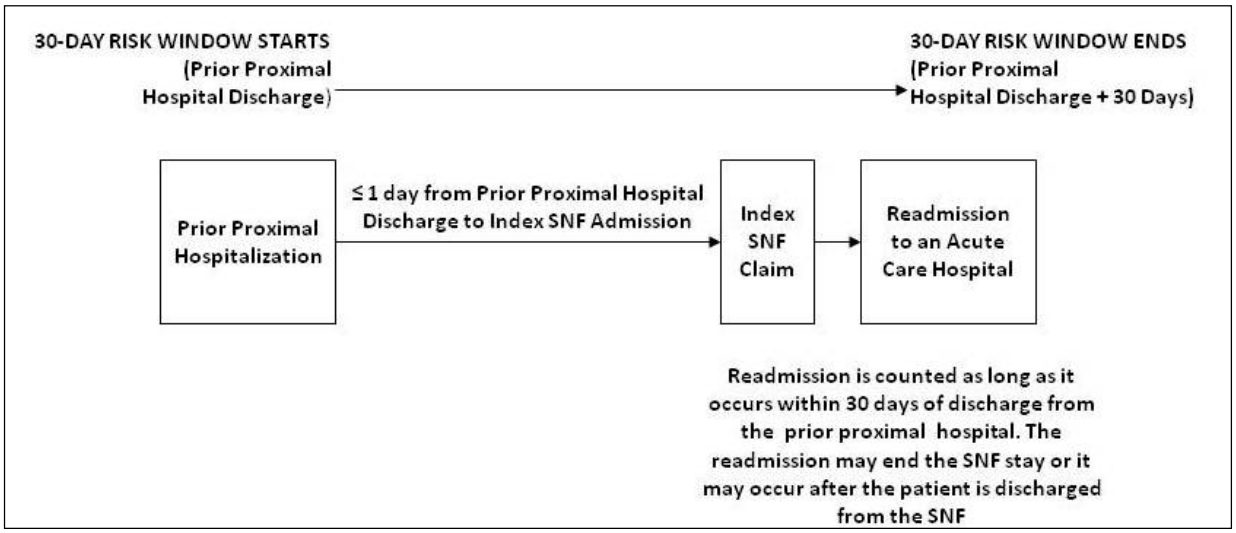
The numerator is more specifically defined as the risk-adjusted estimate of the number of SNF stays with unplanned readmissions that occurred within 30 days of discharge from the prior proximal acute hospitalization. The numerator is mathematically related to the number of SNF stays where there was hospitalization readmission. The measure does not have a simple form for the numerator and denominator—that is, the risk adjustment method used does not make the observed number of readmissions the numerator and a predicted number the denominator. The numerator, as defined, includes risk adjustment for patient characteristics and a statistical estimate of the facility effect beyond patient mix.

Hospital readmissions that occur within the stay or after discharge from the SNF stay but within 30 days of the proximal hospitalization are included in the numerator. This measure does not include observation stays as a readmission (see ***Appendix A***). Readmissions identified as being planned using the CMS Planned Readmission Algorithm plus additional procedures specific to PAC are excluded from the numerator (see ***Section 2.2.3*** and ***Appendix B***).

2.2.1 Thirty-Day Readmission Window

The all-cause SNFRM is evaluated on a 1-year cycle. The SNFRM numerator time window is 30 days after discharge from the prior proximal hospitalization. To be included in the denominator, a patient must have a SNF admission within 1 day after being discharged from the prior proximal hospital stay, and that SNF admission must occur within the target 12-month period. ***Figure 1*** depicts the SNFRM's 30-day risk window starting from the prior proximal hospitalization discharge date. If the readmission occurred during the SNF stay within the 30-day risk window, or after the SNF stay but still within the 30-day risk window, it is counted in the numerator.

Figure 1
Risk Window for the SNF Readmission Measure



2.2.2 Planned Readmissions

The SNFRM used a modified version of CMS's Planned Readmissions Algorithm (CMS, 2014) to identify readmissions that are classified as planned, and should therefore not be included in the numerator. Planned readmissions should not be counted against facilities because, as stated in the documentation for the HWR measure, "…planned readmissions are not a signal of quality of care." (NQF #1789, p. 35). According to the algorithm, a planned readmission is defined as any non-acute readmission in which one of a set of typically planned procedures or diagnoses occurred. If any of the procedures denoted as planned occur in conjunction with a diagnosis that disqualifies a readmission from being considered planned, the readmission will be considered unplanned. The planned readmission algorithm is based on two main principles:

1. Planned readmissions are those in which one of a pre-specified list of procedures took place or readmissions for one of the following took place: bone marrow, kidney, or other transplants. Planned diagnosis categories include maintenance chemotherapy and rehabilitation. Pregnancy diagnoses and procedures such as normal pregnancy, Cesarean section; forceps delivery, vacuum, and breech delivery are also considered planned. Readmissions to psychiatric hospitals or units are also classified as planned readmissions.

2. Admissions for acute illness or for complications of care are not classified as "planned" Even a typically planned procedure performed during an admission for an acute illness would not likely have been planned. We used the principal diagnosis and all of the procedure codes from the readmission to identify planned readmissions.

Unless a readmission met the algorithm definition of planned, it was considered unplanned and counted as a readmission in the measure.

The algorithm developed to identify planned readmissions uses procedure codes and discharge diagnosis categories for each readmission coded using the AHRQ CCS software.

We added procedures to the CMS Planned Readmission Algorithm that were specific to PAC settings based on feedback from a technical expert panel convened by RTI. These additional procedures were codified by a certified nosologist before use. These procedures and diagnoses are currently defined by ICD-9 procedure and diagnosis codes grouped by the AHRQ's CCS, where large clusters were appropriate, and by individual codes, if necessary.

Appendix B provides a flowchart for how the planned readmission algorithm was programmed and lists the planned procedures and diagnoses for both CMS's Planned Readmission Algorithm and the additional PAC procedures added by RTI for this measure. Note this algorithm was refined in the fiscal year 2015 IPPS/LTCH PPS Final Rule (79 Federal Register 50211 through 50216), and the technical documentation can be found at http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html.

At the time of the SNFRM development, ICD-9 codes were used. This measure will be transitioned to ICD-10 in the future, including the planned readmission lists. We prepared a provisional mapping of these ICD-9s to ICD-10s for planned readmissions as part of our NQF submission; however, please note this mapping will be finalized at a future date.

In 2011, there were 2,215,398 SNF stays, of which 467,107 included an unplanned hospital readmission (21.1%). An additional 1.3 percent of SNF stays (or 27,956 stays) ended with readmissions that were classified as planned and not included in the numerator of the measure. These planned readmissions represented only 5.6 percent of all readmissions.

2.3 Definition of Eligible Admissions

Similar to CMS's HWR, we defined eligible SNF stays as those for which we could attribute a prior proximal hospital discharge with no intervening PAC admissions between the prior proximal hospital discharge and SNF admission or after the SNF discharge and with sufficient FFS data to identify readmissions and risk-adjust the measure. We also evaluated whether the procedures and diagnoses during the prior proximal hospitalization were for acute care or rehabilitation services (e.g., prostheses fitting) and whether the reasons for readmission to hospital were for the medical treatment of cancer or were planned readmissions. This measure does not count observation stays as eligible hospital readmissions, as described in **Appendix A**.

2.3.1 Inclusion and Exclusion Criteria

The denominator includes all patients who have been admitted to a SNF within 1 day of discharge from a prior proximal hospitalization, taking denominator exclusions into account. Patients with SNF stays in swing bed facilities are included in the measure. The prior proximal hospitalization includes admissions to an IPPS acute-care hospital, CAH, psychiatric, or cancer hospital. The following SNF stays are excluded from the denominator:

1. SNF stays where the patient had one or more intervening PAC admissions (IRF or LTCH) that occurred either between the prior proximal hospital discharge and SNF admission or after the SNF discharge within the 30-day risk window. Also excluded are SNF admissions where the patient had multiple SNF admissions after the prior proximal hospitalization within the 30-day risk window. We used Medicare Provider Analysis and Review (MedPAR) files to evaluate this exclusion.

   Rationale: Patients who have IRF or LTCH admissions before their first SNF admission are starting their SNF admission later in the 30-day risk window and receiving other additional types of services as compared to patients admitted directly to the SNF from the prior proximal hospitalization. They are clinically different, and their risk for readmission is different from the rest of SNF admissions. Additionally, when patients have multiple PAC or SNF admissions, evaluating quality of care coordination is confounded and even controversial in terms of attributing responsibility for a readmission among multiple PAC or SNF providers.

2. SNF stays with a gap of greater than 1 day between discharge from the prior proximal hospitalization and the SNF admission. We used MedPAR files to evaluate this exclusion.

   Rationale: These patients are starting their SNF admissions later in the 30-day risk window than patients admitted directly to the SNF from the prior proximal hospitalization. They are likely clinically different, and their risk for readmission is different from the rest of SNF admissions.

3. SNF stays where the patient did not have at least 12 months of FFS Part A Medicare enrollment before the proximal hospital discharge (measured as enrollment during the month of proximal hospital discharge and the 11 months before that month). We used the Medicare Denominator file to evaluate this exclusion.

   Rationale: FFS Medicare hospital claims are used to identify comorbidities during the 12-month period before the proximal hospital discharge for risk adjustment. Multiple studies have shown that using lookback scans of a year or more of claims data provide superior predictive power for outcomes, including rehospitalization, as compared to using data from a single hospitalization (e.g., Klabunde et al., 2000; Preen et al., 2006; Zhang et al., 1999).

4. SNF stays in which the patient did not have FFS Part A Medicare enrollment for the entire risk period (measured as enrollment during the month of proximal hospital discharge and the month after the month of discharge). We used the Medicare Denominator file to evaluate this exclusion.

   Rationale: Readmissions occurring within the 30-day risk window when the patient does not have FFS Medicare coverage cannot be detected using claims.

5. SNF stays in which the principal diagnosis for the prior proximal hospitalization was for the medical treatment of cancer. See ***Table 1*** for the cancer discharge condition

categories excluded from the measure. We used MedPAR files for the prior proximal hospitalization to evaluate this exclusion.

Patients with cancer whose principal diagnosis from the prior proximal hospitalization was for other diagnoses or had surgical treatment of their cancer remain in the measure.

Rationale: These admissions have a very different mortality and readmission risk from the rest of the Medicare population, and outcomes for these admissions do not correlate well with outcomes for other admissions, as determined in the development of the HWR measure.

6. SNF stays where the patient was discharged from the SNF against medical advice. We used MedPAR files to evaluate this exclusion.

   Rationale: The SNF was not able to complete care as needed.

7. SNF stays in which the principal diagnosis for the prior proximal hospitalization was for "rehabilitation care; fitting of prostheses and for the adjustment of devices." We used MedPAR files for the prior proximal hospitalization to evaluate this exclusion.

   Rationale: Hospital admissions for these conditions are not for acute care.

8. SNF stays in which the prior proximal hospitalization was for pregnancy.

   Rationale: This is a very atypical reason for beneficiaries to be admitted to SNFs.

9. SNF stays in which data were missing on any covariate or variable used in the SNFRM construction.

   Rationale: These patients have incomplete information on which to base risk adjustment.

Table 1
Cancer discharge condition categories excluded from the measure
(Medicare FFS data, 2011)

AHRQ CCS	Description	Number of Admissions
42	Secondary malignancies	9,638
19	Cancer of bronchus; lung	5,941
44	Neoplasms of unspecified nature or uncertain behavior	2,100
45	Maintenance chemotherapy; radiotherapy	1,953
38	Non-Hodgkin`s lymphoma	1,837
17	Cancer of pancreas	1,380
14	Cancer of colon	1,324
39	Leukemias	1,309
40	Multiple myeloma	1,258
35	Cancer of brain and nervous system	1,200
11	Cancer of head and neck	839
16	Cancer of liver and intrahepatic bile duct	686
15	Cancer of rectum and anus	646
13	Cancer of stomach	599
12	Cancer of esophagus	567
18	Cancer of other gastrointestinal organs; peritoneum	554
29	Cancer of prostate	530
24	Cancer of breast	528
27	Cancer of ovary	415
43	Malignant neoplasm without specification of site	396
33	Cancer of kidney and renal pelvis	385
32	Cancer of bladder	366
25	Cancer of uterus	267
21	Cancer of bone and connective tissue	196
23	Other non-epithelial cancer of skin	147
41	Cancer; other and unspecified primary	145
28	Cancer of other female genital organs	95
26	Cancer of cervix	94
37	Hodgkin`s disease	74
20	Cancer; other respiratory and intrathoracic	63
36	Cancer of thyroid	49
34	Cancer of other urinary organs	46
22	Melanomas of skin	43
31	Cancer of other male genital organs	19
30	Cancer of testis	2
	Total	35,691

SOURCE: RTI Analysis of Medicare Claims (output: readmit139_cancers_excl_2011.xls)

Table 2 summarizes the frequency of exclusions from the denominator of this measure using the MedPAR claims and Denominator data for 2011. For each analysis, RTI identified SNF admissions preceded by an acute-care hospitalization (IPPS, CAH, psychiatric, or cancer hospital) for each file year. Before applying exclusion criteria, the initial analytic file for 2011 included 2,115,398 index SNF stays in 16,656 SNFs.

To examine the impact of exclusion criteria on the denominator specification of the SNFRM, RTI calculated the overall proportion of SNF stays excluded on the basis of each exclusion criteria. The distribution of exclusions across facilities shows whether some facilities are disproportionately impacted by each exclusion. Additionally, for the exclusions that apply to patients who received PAC between the prior proximal hospital discharge and their SNF admission, or after their SNF discharge but within the 30-day risk window, we compared patient characteristics between patients who were included and excluded from the measure.

Table 2
Frequency of denominator exclusions

Individual exclusions (not mutually exclusive)	Frequency	Percentage
Exclusion 1*:* Intervening PAC stays (between prior proximal hospital discharge and SNF admission, or after SNF discharge but before the end of the 30-day risk period)	232,687	8.4
Exclusion 2*:* Gap of greater than 1 day between prior proximal hospital discharge and SNF admission[1]	156,246	5.6
Exclusion 3*:* Not continuously enrolled in Medicare FFS for the full year before prior proximal hospital discharge	160,403	5.8
Exclusion 4*:* Discharged from SNF against medical advice	9,686	0.4
Exclusion 5*:* Principal diagnosis in prior proximal hospitalization for medically treated cancer	35,691	1.3
Exclusion 6*:* Principal diagnosis in prior proximal hospitalization for rehabilitation care	2,119	0.1
Exclusion 7*:* Not enrolled in Medicare FFS for the month of the prior proximal hospitalization and the 1 month after the hospitalization	150,815	5.4
Total excluded for any reason[2]	538,306	19.7

1 This exclusion covers cases with PAC or SNF stays occurring in the gap between the prior acute hospital discharge and the SNF admission

2 Exclusions shown in this table are not mutually exclusive. Patients may be counted in more than one excluded category.

SOURCE: RTI analysis of 2011 MedPAR data (output: idxSNF03_lk_all_yrs_001_2011.xls)

We also examined the impact of applying measure exclusions on facility measure scores. For each criterion, we examined the absolute difference in facilities' risk-standardized readmission rates (RSRRs) calculated with and without each exclusion (applying all other

exclusions except the one of interest). We also examined facility rank change across quintiles of RSRR calculated with and without the exclusion of interest applied. These analyses included all facilities regardless of facility sample size.

We did not do this analysis for the exclusion criteria pertaining to data availability (i.e., patients not enrolled in Medicare FFS for the month of the prior proximal hospitalization or the 1 month after the hospitalization). Because these exclusions are largely based on data limitations that would prevent proper analysis, no further analyses were conducted to assess the impacts of these exclusions. In many cases, the lack of available claims data meant that further analysis was not feasible.

We further detail each of the measure exclusions below and, where relevant, summarize the relevant analyses conducted.

Exclusion 1[1] *- SNF stays where the patient had one or more intervening PAC stays (IRF or LTCH) that occurred either between the prior proximal hospital discharge and SNF admission, or after the SNF stay but within the 30-day risk window. Also excluded are any stays in which the patient had multiple SNF admissions after the prior proximal hospitalization*

Exclusion 2 *- SNF stays with a gap of greater than 1 day between discharge from the prior proximal hospitalization and the SNF admission.*

RTI conducted analyses to evaluate whether patients with gaps of more than 1 day between their prior proximal hospitalization and their index SNF admission and patients with an intervening PAC admission (from an IRF, LTCH, and/or another SNF) before their index SNF admission in the 30-day risk window are similar to those who are discharged from the hospital directly to a SNF with no additional PAC stays after their index SNF.

Focusing on gaps due to intervening IRF and LTCH admissions, we found that most (89.5%) of the 2011 index SNF stays (2011 MedPAR file) were transfers from the prior proximal acute hospitalization directly to a SNF with no gap or intervening PAC admission (***Table 3***, group 1). Approximately 2 percent had no intervening PAC admission yet had a gap of greater than 1 day between discharge from the prior proximal hospital and SNF admission (group 2), 3.7 percent had one SNF admission with a gap due to intervening IRF and LTCH admission(s) (group 3), and 4.8 percent had multiple SNF admissions with or without intervening IRF/LTCH admissions (group 4) (***Table 3***).

[1] We describe the first two exclusions together here because of the overlap in the two groups of patients.

Table 3
Evaluating gap and intervening IRF or LTCH admissions between prior proximal hospitalization discharge and SNF admission, 2011

Gap and Intervening PAC stay categories	Frequency (%)	Readmission rate (%)
No intervening IRF/LTCH/SNF and no gap (group 1)	2,492,388 (89.5)	21.8
No intervening IRF/LTCH/SNF and a gap (group 2)	54,345 (2.0)	15.4
Intervening IRF/LTCH (One SNF) (group 3)	104,119 (3.7)	8.6
Multiple SNFs (Could also be intervening IRF/LTCH) (group 4)	134,717 (4.8)	13.2

SOURCE: RTI analysis of 2011 MedPAR data (output: idxSNF02_lk_all_yrs_013b.xls)

Examining the 2011 file, only 30 facilities out of 16,656 SNFs had an absolute change in RSRR of more than 1 percentage point when patients with a gap of greater than 1 day were not excluded, but 1,593 (9.6%) changed quintiles of ranking.[2] When patients with intervening PAC stays were not excluded from the measure, only 16 facilities had an absolute change in RSRR of more than 1 percentage point, and only 279 changed facility quintile ranking.[3]

We excluded patients who have IRF or LTCH admissions before their first SNF admission and patients with gaps greater than 1 day between their SNF admission and discharge from the prior proximal hospitalization. These patients start their SNF admission later in the 30-day risk window and receive other additional types of services as compared with patients admitted directly to the SNF from the prior proximal hospitalization. They are also clinically different, and their risk for readmission is different from the rest of SNF admissions. Consistent with this hypothesis, readmission rates varied across these groups. Those with one SNF and intervening IRF/LTCH admissions (***Table 3***, group 3) had the lowest rates of readmission (8.6%) as compared with the other three groups. Of those with no gap and no intervening PAC admission (***Table 3***, group 1), 21.8 percent were readmitted. For those with a gap and no intervening PAC admission (***Table 3***, group 2), 15.4 percent were readmitted. Finally, of those with multiple SNF admissions with or without IRF/LTCH admissions (***Table 3***, group 4), 13.2 percent were readmitted.

Additionally, we compared these four groups by potential predictors of readmission, including age, sex, Medicare disability status, ESRD, number of IPPS stays in preceding 12 months, whether they had surgery during the prior proximal hospitalization, and selected comorbidities (congestive heart failure, arrhythmias, diabetes with complications, gastrointestinal hemorrhage, chronic obstructive pulmonary disease, acute renal failure, urinary

[2] Source: RTI analysis of 2011 MedPAR data (output: readmit142_idxSNF02_HLMFinal_exclOth_RiskComp_keepDG.xls)
[3] Source: RTI analysis of 2011 MedPAR data (output: readmit142_idxSNF02_HLMFinal_exclOth_RiskComp_keepDPI.xls)

tract infection, electrolyte imbalance, acute myocardial infarction, cellulitis, shock, septicemia, and pneumonia). These groups looked very similar (with ***Table 3***, group 3 having slightly lower frequencies of comorbidities overall), with the exception of proximal hospitalization length of stay and having had a surgical procedure during their prior proximal hospitalization. Those with one SNF and intervening IRF/LTCH admissions (***Table 3***, group 3) had longer hospital lengths of stay than those in the other three groups. This group also had the highest percent of prior proximal hospitalizations involving surgical procedures (40.7%) as compared with those with no gap and no intervening PAC admission (27.1%, group 1), those with a gap and no intervening PAC admission (15.7%, group 2) and those with multiple SNF admissions with or without IRF/LTCH admissions (24.6%, ***Table 3***, group 4). The readmission rate for patients who had surgery during their prior proximal hospitalization was lowest in those with only one SNF and intervening IRF/LTCH stays (8.1%, group 3), compared with those with those who had no gaps or intervening PAC stays (18.2%, group 1), those with a gap and no intervening PAC admission (14.8%, group 2), and those with multiple SNF admissions, with or without IRF/LTCH admissions (11.8%, group 4) (***Table 3***).[4] This observation supports the rationale that patients who had intervening IRF/LTCH stays are entering the SNF at a later stage of their recovery and are therefore at a different risk for readmission than patients who were admitted directly to the SNF from their prior proximal hospitalization.

To examine whether certain SNFs are disproportionately impacted by these exclusions, we also explored the facility-level distribution of SNF admissions that had a gap of greater than 1 day between SNF admission and discharge from the prior proximal hospital and/or intervening PAC admissions using the 2011 MedPAR data file. The facility mean and median number of SNF stays for those with no gap and no intervening PAC admissions (***Table 3***, group 1) was 149.3 and 107 stays respectively, with an interquartile range of 146. The corresponding means and medians were 3.3 and 2 stays, with an interquartile range of 4, for group 2; 6.2 and 3 stays, with an interquartile range of 6, for group 3; and 8.1 and 5 stays, with an interquartile range of 6, for group 4 (***Table 3***).[5]

Combined, these analyses provide justification that excluding SNF admissions with intervening IRF or LTCH admissions or with multiple SNF stays will not have a detrimental or substantial effect on the SNFRM. The patients with multiple PAC stays after a prior proximal hospitalization are not systematically different from those with only one SNF stay with regard to comorbidities but are very different with regard to readmission risk. Additionally, concerns about attribution, given the mix of providers these patients have received services from during the risk period, argue for the appropriateness of excluding these patients. Lastly, patients with multiple PAC stays do not cluster in a small group of facilities, so no facilities are disproportionately impacted by these exclusions.

Exclusion 3 *- SNF stays where the patient did not have at least 12 months of FFS Part A Medicare enrollment before the proximal hospital discharge (measured as enrollment during the month of proximal hospital discharge and the 11 months before that discharge).*

[4] Source: RTI analysis of 2009 MedPAR data (output: idxSNF02_lk_all_yrs_015b.xls)

[5] Source: RTI analysis of 2011 MedPAR data (output: idxSNF02_lk_all_yrs_019_2011.xls)

Using the 2011 MedPAR data, 160,403 (5.8%) of the stays were excluded because the patient was not enrolled for least 11 months of FFS Medicare before their prior proximal hospitalization. Of the patients excluded for insufficient months of FFS Medicare enrollment, 21.5 percent were readmitted, compared to 20.7 percent of patients with sufficient months of enrollment.[6]

Exclusion 4 *- SNF stays in which the patient did not have FFS Medicare enrollment for the entire risk period, that is, the 30 days after discharge from the prior proximal hospitalization (measured as enrollment during the month of proximal hospital discharge and the month following the month of discharge).*

Using 2011 MedPAR data, 140,971 patients were excluded because they were not enrolled in FFS Medicare during the full 30 days after discharge from their prior proximal hospitalization. Of these, 29.8 percent were readmitted, compared to 20.2 percent of patients who were enrolled in FFS Medicare.[7]

Excluded patients were evenly distributed across facilities. Looking at facility distributions of patients excluded for insufficient FFS enrollment in the months before hospitalization combined with those who did not have FFS Medicare enrollment for the entire risk period, we found a fairly even impact of the exclusion across facilities. There is a narrow interquartile range, with an absolute difference of 3.9 percentage points between the 25th and 75th percentile. However, 5 percent of facilities had 15.2 percent or more of their patients excluded for not having sufficient months of FFS Medicare enrollment.[8] Analyses of 2009 data that looked at these two groups of patients separately also showed relatively even distributions of these patients across facilities. Regardless of these results it would be inappropriate to include these patients because readmissions occurring during the 30 day risk period but when patients were not enrolled would not be detected.

Exclusion 5 *- SNF stays in which the prior proximal hospitalization was for the medical treatment of cancer.*

Only 35,691 or 1.3 percent of the 2011 MedPAR stays were excluded because the patient's prior hospitalization involved the medical treatment of cancer; 25.7 percent of these patients were readmitted within 30 days, compared to 20.7 percent of patients without a diagnosis of medical treatment of cancer.[9] The proportions of excluded patients across facilities were uniformly low, with only 5 percent of SNFs having 3.6 percent or more of their patients excluded for the medical treatment of cancer.[10]

Examining the 2011 file, only 23 facilities had an absolute change in RSRR of more than 1 percentage point, and only 1,004 changed quintile of facility ranking when patients with a prior

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6 Source: RTI analysis of 2011 MedPAR data (output: idxSNF03_lk_all_yrs_001_2011.xls)
7 Source: RTI analysis of 2011 MedPAR data (output: idxSNF03_lk_all_yrs_001_2011.xls)
8 Source: RTI analysis of 2011 MedPAR data (output: readmit094_idxSNF02_FacilityExcl_02_2011.xls)
9 Source: RTI analysis of 2011 MedPAR data (output: idxSNF03_lk_all_yrs_001_2011.xls)
10 Source: RTI analysis of 2011 MedPAR data (output: readmit094_idxSNF02_FacilityExcl_02_2011.xls)

proximal hospital diagnosis of medical treatment of cancer were not excluded.[11] The exclusion of the group of patients who had non-surgical cancer treatment in the prior acute stay was based on the work done in developing the HWR measure (NQF #1789). Their post-discharge trajectory of readmissions was not consistent with other patient groups. The observed clustering of these patients in a few facilities, and facility rank change of a quintile or more for just over a thousand facilities, suggests that the exclusion of these patients is appropriate. These findings are consistent with the rationale given for this exclusion from the HWR that patients with a diagnosis of medical treatment of cancer have very different risk for readmission than other patients, and should therefore be excluded from the SNFRM to allow fair assessment of facilities.

Exclusion 6 *- SNF stays where the patient was discharged from the SNF against medical advice.*

Based on 2011 MedPAR data, less than 1 percent of patients (n=7,653 [0.4%]) were discharged from the SNF against medical advice, and of these, 21.0 percent were readmitted within 30 days, compared to 20.7 percent of patients who were not discharged from the SNF against medical advice.[12] The facility distribution did not suggest any clustering of excluded patients in facilities. SNFs at the 95th percentile had only 1.7 percent of their patients excluded for leaving the SNF against medical advice.[13]

Examining the 2011 file, only 24 facilities had an absolute change in RSRR of more than 1 percentage point and only 317 changed quintile of facility ranking when patients discharged from the SNF against medical advice were not excluded.[14]

Exclusion 7 *- SNF stays where the patient's principal diagnosis during their proximal hospitalization was for "rehabilitation care; fitting of prostheses and for the adjustment of devices."*

Very few patients' prior proximal hospitalization involved rehabilitation care (n=1,770 [0.08%]). Of those patients, 16.5 percent were readmitted within 30 days, compared with 20.7 percent of patients without a principal diagnosis of rehabilitation care.[15] These patients were so few in number that a facility analysis was not informative.[16]

Examining the 2011 file, only 2 facilities had an absolute change in RSRR of more than 1 percentage point, and only 56 changed quintile of facility rank when patients with a prior proximal hospital diagnosis of rehabilitation care were not excluded.[17]

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[11] Source: RTI analysis of 2011 MedPAR data (output: readmit142_idxSNF02_HLMFinal_exclOth_RiskComp_keepDCA.xls)
[12] Source: RTI analysis of 2011 MedPAR data (output: idxSNF03_lk_all_yrs_001_2011.xls)
[13] Source: RTI analysis of 2011 MedPAR data (output: readmit094_idxSNF02_FacilityExcl_02_2011.xls)
[14] Source: RTI analysis of 2011 MedPAR data (output: readmit142_idxSNF02_HLMFinal_exclOth_RiskComp_keepDA.xls)
[15] Source: RTI analysis of 2011 MedPAR data (output: idxSNF03_lk_all_yrs_001_2011.xls)
[16] Source: RTI analysis of 2009 MedPAR data (output: readmit112_idxSNF02_FacilityExcl_01.lst, readmit094_idxSNF02_FacilityExcl_02_2009.xls)
[17] Source: RTI analysis of 2011 MedPAR data (output: readmit142_idxSNF02_HLMFinal_exclOth_RiskComp_keepDR.xls)

Exclusion 8 *- SNF stays in which the prior proximal hospitalization was for pregnancy.*

Very few patients' prior proximal hospitalization was for pregnancy (n=17). These were excluded given that this is a very atypical reason for beneficiaries to be admitted to SNFs.

Exclusion 9 *- SNF stays in which data were missing on any covariate or variable used in the SNFRM construction.*

Very few patients were missing data on any variables used for the construction of the SNFRM. After applying all other exclusions, there were 2,215,562 records in the 2011 dataset. Of these, 164 (0.007%) were missing any data. Specifically, these patients were missing data on ESRD status, leaving a total of 2,215,398 in the 2011 model.[18]

In summary, based on the results reported above, we conclude that all exclusions appeared to have little impact on absolute facility RSRRs. Those exclusions focusing on prior proximal diagnosis of rehabilitation, discharge from SNF against medical advice, and intervening PAC stays appeared to have little impact on facility ranking. The inclusion of very small facilities in the exclusion analyses may have exaggerated the impact of exclusions on facility RSRRs. For the two exclusions with the largest impact on facility ranking, patients with a SNF admission gap greater than 1 day and patients with a prior proximal hospital diagnosis of medical treatment of cancer, shifts in decile rank occurred in the middle of the distribution. Facilities with the smallest sample size tended to have RSRRs closer to the mean, because of shrinkage, and would have been most impacted by a change in raw readmissions of only one or two patients. Given that this measure utilizes administrative claims data, we have no concerns about missing data distorting provider performance.

2.4 Data Sources and Sample Sizes

2.4.1 Data Sources

This measure is for Medicare beneficiaries and uses the data in the Medicare eligibility files and inpatient claims data. The eligibility files provide information on date of birth, sex, reasons for Medicare eligibility, periods of Part A coverage, and enrollment periods in the FFS program. The data elements from the Medicare FFS claims are those basic to the operation of the Medicare payment systems and include date of admission, date of discharge, diagnoses, procedures, indicators for use of dialysis services, and indicators of whether the Part A benefit is exhausted. The inpatient claims data files contain beneficiary-level SNF and other hospital records. No data beyond the bills submitted in the normal course of business are required from the providers for the calculation of this measure.

The measure uses 1 year of data to calculate the measure rate for the SNFRM, which we believe is sufficient to calculate this measure in a statistically reliable manner. This is because the reliability of a SNF's measure rate is related to its sample size.

[18] Source: RTI analysis of 2011 MedPAR data (output:readmit113_idxSNF02_UniVar_Descript_Model_2011.xls)

Following are the specific files used and links to the documentation:

- **Medicare inpatient claims**—MedPAR (short stay, long stay) files (2007-2012), index SNF claims from SNF MedPAR files (2009-2011). Documentation for the Medicare claims data is provided online by the CMS contractor, Research Data Assistance Center (ResDAC) at the University of Minnesota. The following web page includes data dictionaries for these files: MedPAR: http://www.resdac.org/cms-data/files/medpar-rif/data-documentation

- **Medicare Enrollment Database (EDB)**. Information about the Enrollment Database may be found here: http://aspe.hhs.gov/datacncl/datadir/cms.htm.

- **Medicare Denominator files** (2009-2011). Documentation available at http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/IdentifiableDataFiles/DenominatorFile.html.

- **AHRQ CCS groupings of ICD-9 codes**. Documentation available at http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp.

- **CMS's hierarchical condition category (HCC) mappings of ICD-9 codes**. Mappings are included in the software at the following website: http://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/Risk-Adjustors.html.

2.4.2 Final Sample Sizes

To develop the risk-adjustment model for this measure, we analyzed Medicare claims, Denominator, and EDB files for 2009, 2010, and 2011, and identified SNF admissions preceded by an acute-care hospitalization (IPPS, CAH, psychiatric, or cancer hospitals).

After applying the exclusion criteria detailed above, the final analytic files included the following counts of stays and facilities:

2009: 2,191,546 index SNF stays in 16,713 SNFs

2010: 2,200,685 index SNF stays in 16,671 SNFs

2011: 2,215,398 index SNF stays in 16,656 SNFs

2.5 Risk Adjustment

In this section, we describe the steps we went through to develop our final risk-adjustment model, including selection of covariates and approaches to case mix adjustment.

2.5.1 Covariate Selection—Conceptual Rationale

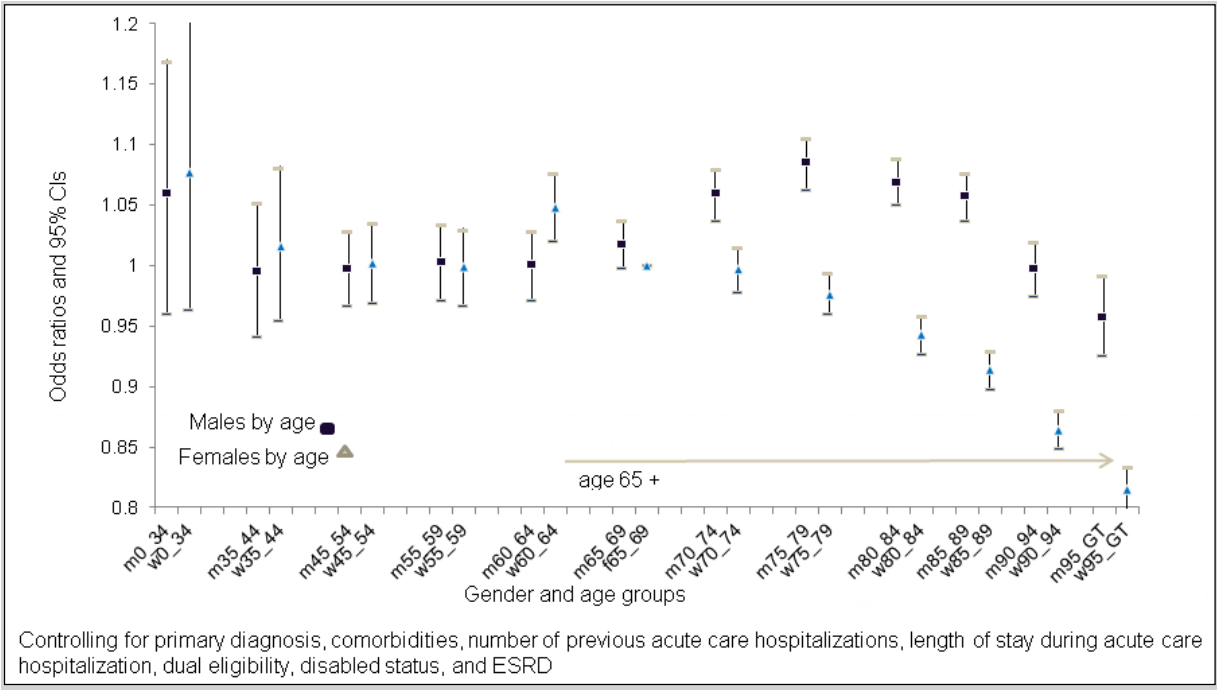
The risk-adjustment model for SNFRM accounts for variation across SNFs in case-mix and patient characteristics predictive of readmission using hierarchical logistic regression. The

goal of risk adjustment is to account for differences across SNFs in patient demographic and clinical characteristics that might be related to the outcome but pre-exist the admission to the SNF. For this reason, patient acuity (case mix) was taken into account by including patients' hospital principal diagnosis and comorbidities in the predictive models. In addition, we included the demographic variables (i.e., age and sex), and other health service factors, such as length of stay during the patient's prior proximal hospitalization and number of prior hospitalizations in the previous 365 days. ***Table 4*** below details the rationale for each covariate. We report the counts and unadjusted readmission rates by patient characteristic for our final selected set of covariates in ***Appendix C Table C1***.

This measure was submitted to the NQF in February 2014. At that time, NQF guidelines regarding disparities in care quality stated that socioeconomic status, sex, race, and ethnicity should not be included as adjustment variables in models because the standards of care should not vary across demographic markers for vulnerability to disparities in health outcomes and receipt of quality care. However, the issue of adjusting for socio-economic or socio-demographic status is being reconsidered at the time of this report (see ***Section 4*** for the current status of this issue). Therefore, the discussion below refers to the rationale for these decisions at the time of NQF submission. It is possible that the specific risk-adjustment model described below will be revised pending further testing.

Despite prior NQF guidance, for some outcomes, an argument can be made that certain potential markers of vulnerability for disparities (i.e., sex and age) are also associated with demonstrated clinical/physiologic differences that can determine risk at the time the patient enters the SNF. Our analyses indicate that readmission risk does vary by sex, but what we observe is inconsistent with the overall gender disparities literature examining patient outcomes and receipt of quality care for other patient populations and settings. This literature tends to focus on women and girls as being disproportionately vulnerable to poorer health outcomes compared with men and boys. In our analyses of SNF readmission data, we found a statistically significant association between higher readmission rates and being male when comparing male and female SNF patients ages 70 and older (see ***Figure 2*** below). On the other hand, we found that rates of readmission were not statistically different for male and female SNF patients under age 70. These findings were consistent with evidence from prior published research that readmission rates among SNF patients aged 75 and older do vary by sex, with higher rates of readmission among male SNF patients (O'Malley, Caudry, and Grabowski 2011). Given our findings, which suggest patterns of readmissions inconsistent with evidence of gender disparities, but consistent with potential clinical differences in risk for readmission based on patient sex, we included sex in our models.

Figure 2
Odds ratios for sex by age readmission analysis with 95 percent confidence intervals



Controlling for primary diagnosis, comorbidities, number of previous acute care hospitalizations, length of stay during acute care hospitalization, dual eligibility, disabled status, and ESRD

Table 4
Covariates used in the models

Variable	Rationale	Supporting Literature
Age*	Demographic characteristic that is often important for readmission and associated with higher frailty and increasing number of comorbidities.	Several studies found a correlation between age and higher risk of readmission. Compared to patients less than 55 years of age, risk of readmission increased starting at age 70 and continued increasing with each 5-year increment until age 89 (Jencks et al., 2009). In a study of risk factors for hospitalization in patients 65 and older, being 75 years of age or older was found to increase risk of hospitalization (Silverstein et al., 2008).
Sex*	Demographic characteristic that is important for predicting readmission for the SNF population.	Male sex was found to be associated with an increased risk of hospitalization in several studies (Jencks et al., 2009; Li et al. 2011; Kind et al., 2007; Bernheim et al., 2012; Ouslander 2011). Other research on cross-setting PAC patients found male sex to be a factor that decreased risk of readmission (Gage et al., 2012). Although these results are mixed, they indicate that sex is an important factor to consider.
Length of stay during prior proximal hospitalization	Patients who are hospitalized for longer periods of time may require more complex care because they are often sicker. In addition, bed rest from prolonged hospitalizations often leads to deconditioning and functional impairment.	Several studies indicate that Medicare beneficiaries with long lengths of hospitalization increase the risk of a readmission (Jencks et al., 2009; Kind et al., 2007). Long lengths of stay, combined with the number of previous hospitalizations and reason for hospitalization, had more impact on the risk of readmission than demographic factors (Jencks et al., 2009).
Any time spent in the intensive care unit (ICU) during the prior proximal hospitalization	ICU stays are an important indicator of medical severity and a predictor of PAC resource use.	RTI analyses of PAC populations found that number of days spent in the ICU was an important indicator of resource use, which reflects overall medical complexity of the patient (Gage et al., 2012).
Disabled as original reason for Medicare coverage	This is an indicator of overall patient complexity, as qualification for Medicare because of disability requires the presence of serious chronic medical conditions that limit the ability to work.	Jencks et al. (2009) found that disability as a reason for Medicare coverage increased the risk of readmission by 13 percent. In studies of PAC, patients with lower functional abilities are more likely to be readmitted (Gage et al. 2012; Dombrowski et al., 2012).
ESRD	This factor is often important in other risk-adjustment work RTI does and has been identified as a risk factor for readmission in prior studies.	ESRD increased the risk of readmission by 14-35 percent (Berheim et al., 2012; Jencks et al., 2009). In the post-acute-care population, the presence of renal failure increased the likelihood of readmission by 30 percent overall, and by an even greater margin in certain subpopulations (Gage et al., 2012).
Number of acute care hospitalizations in the 365 days before the prior proximal hospitalization	More hospitalizations in the previous year may be associated with declining health and increased complexity of care.	In the Medicare population, the number of previous hospitalizations, combined with length of stay and the reason for the hospitalization, had more impact on the risk of readmission than any other patient characteristic (Jencks et al., 2009).

(continued)

Table 4 (continued)
Covariates used in the models

Variable	Rationale	Supporting Literature
Principal diagnosis as categorized using AHRQ's single-level CCS	First diagnosis from the Medicare claim corresponding to the prior proximal hospitalization as coded by AHRQ's CCS; use of CCS categories to group principal diagnoses also harmonizes with the HWR.	Many readmissions are complications or recurrences of the prior proximal hospitalization (62%, Dombrowski et al., 2012). Some conditions are associated with a greater incidence of readmission: pneumonia, congestive heart failure, and urinary tract infection (Ouslander et al., 2011; Dombrowski et al., 2012). Also, the 100 most frequent readmission disease-related groups accounted for 73.2 percent of all readmissions, indicating that certain diagnoses are significant predictors (Jencks et al., 2009).
System-specific surgical indicators	Surgical patients differ from medical patients and often are not as medically acute. However, surgical procedures place patients at risk for potential additional complications, such as surgical site infection, retention of a foreign body, or allergic reaction to anesthesia. In other cases, such as orthopedic procedures, the presence of a surgical indicator may indicate that the patient is otherwise relatively healthy.	Research indicates that readmission rates vary by reason for prior proximal hospital stay, with the presence of surgical indicators contributing to both higher and lower readmission rates (Gage et al., 2012). In kidney, cardiac, and vascular patients, a surgical indicator as opposed to a medical indicator increased the likelihood of a readmission, whereas in orthopedic patients, the surgical indicator was associated with a lower risk of readmission (Gage et al., 2012).
Individual comorbidities as grouped by CMS's HCCs or other comorbidity indices	Comorbidities provide indicators of case mix and severity of the patient's health. Use of HCCs to categorize comorbidities also harmonizes with the HWR.	Multiple studies find that the presence of certain comorbidities raises the risk of readmission. Common comorbidities found to especially increase the risk of readmission include ESRD, diabetes, heart failure (Bernheim et al. 2012, Gage et al., 2012), and pressure ulcers (Dombrowski et al., 2012). Researchers at the University of Colorado used the Charlson/Deyo comorbidity index, which groups 17 ICD-9 disease condition categories for risk adjustment when calculating SNF readmission rates (Min et al., 2011).
Multiple comorbidities, modeled using (1) the count of HCCs if count is >2, and (2) the square of this count	Patients with multiple comorbidities will tend to be frailer, putting them at increased risk for readmission. This counter captures case complexity beyond the linear additivity of the individual comorbidities.	In a study of SNF readmission, one of the factors significantly associated with readmission was higher scores on the Charlson Comorbidity Index (Dombrowski et al., 2012), which is calculated using both the number and seriousness of comorbidities (Charlson et al., 1987).

*Age and sex are included in the model as an interaction, recognizing that the impact of sex on readmission varies over patient age (see **Figure 2** above).

To capture comorbidities, we used the secondary medical diagnoses listed on the patient's prior proximal hospital claim as well as all diagnoses listed on acute care hospitalizations that occurred in the prior 12 months. We classified these comorbidities using the HCCs that RTI

developed for CMS (Pope et al., 2000). The HCCs were developed by grouping the 14,000+ ICD-9 codes into approximately 800 diagnosis groupings, which were then grouped into about 200 hierarchical condition categories. The categories were based on clinical and Medicare cost criteria.

Other facility characteristics associated with higher readmission rates included being a for-profit facility (as opposed to government-run or not-for-profit facility), being a free-standing facility (as opposed to a hospital-based facility), and having a larger proportion of stays funded by Medicaid (Li, 2011). RTI did not adjust for being a for-profit or free-standing facility in the model. The standard of care should not depend on variables such as facility ownership or source of payer.

2.5.2 Specific Approach to Case Mix Adjustment Using the Comorbid Risk Variables

Our selection of comorbid risk variables differed from the process used for the HWR, which built on previous work done for the development of condition-specific hospital readmission measures. As the HWR population and treatments are different from the SNFRM population and treatments, this necessitated different approaches to stratification, risk adjustment, and the exclusion of planned readmissions; however, the overall analytic approach was harmonized as much as possible. The HWR measure created cohorts based on the principal diagnosis, which corresponded to hospital care teams. We evaluated the final comorbid risk variables used for the HWR as a starting point, and initially tested cohort-based models, using cohorts appropriate to the SNF population developed in consultation with our TEP and clinical experts. However, we did not find that cohorts improved the fit and calibration of the risk adjustment model, so we did not apply them in our final model. The SNFRM used the secondary diagnoses coded for the prior proximal hospitalization as well as all the diagnoses from hospitalizations that occurred in the 12 months before the index SNF stay to adjust for patient acuity and illness severity. This is consistent with the HWR strategy for identifying comorbidities.

We used a full year of MedPAR claims from 2009, with 12 months history data, to develop the risk-adjustment model and select risk variables. We constructed analytic files for 2010 and 2011 using MedPAR data to validate the performance and assess the reliability of the measure.

Below we describe the steps we employed for variable selection and development with regard to principal diagnoses (measured using AHRQ CCS) and comorbidities (measures using HCCs), which were included in our final risk adjustment model.

2.5.3 Principal Diagnosis

To capture patients' primary reason for their prior proximal hospitalization, we aggregated the principal discharge diagnosis and all the procedures from the prior proximal hospitalization using the AHRQ CCS single-level code groupings. The current SNFRM uses AHRQ's CCS codes for ICD-9-CM, and we plan to use the same CCS groupings in our models after the transition to ICD-10. AHRQ has a beta version of the mapping between ICD-10

procedure codes and the CCS codes on their website (http://www.hcup-us.ahrq.gov/toolssoftware/beta/icd_10_beta.jsp). The final grouper was expected in October 2014. We will continue to monitor and review these mappings of CCS codes to ICD-10 to identify any potential changes that may impact this measure.

1. Initially we ran a logistic regression model that included all of the AHRQ CCS categories, the demographic and clinical covariates listed in ***Table 4***, and all individual HCCs. Osteoarthritis was selected as the referent category for the principal diagnosis, because it was protective (i.e., associated with lower odds of readmission) and had high prevalence.

2. This initial model kept all CCS categories ungrouped, but we noted that some CCS categories had very low prevalence in our population, and individually, these ungrouped diagnoses were not adding to model prediction. We chose to combine these codes into two groups: five codes that reduced the risk of readmission (***Table 5***) and 29 codes (***Table 6***) that increased the risk of readmission.

Table 5
Non-significant CCS with protective effects grouped in final model (N=5), 2009 data

CCS	N with CCS	% with CCS	N readmitted	% readmitted
10 Immunizations and screening for infectious disease	52	<0.01%	5	9.62%
56 Cystic fibrosis	14	<0.01%	1	7.14%
86 Cataract	11	<0.01%	1	9.09%
652 Attention-deficit/conduct/ disruptive behavior disorders	501	0.02%	57	11.38%
656 Impulse control disorders	285	0.01%	34	11.93%
Total	863	0.04%	98	11.36%

SOURCE: RTI Analysis of 2009 MedPAR data (output: readmit107_idxSNF02_BiVar_Descript_Model_nomiss_2009.xls)

Table 6
Non-significant CCS with effects indicating increased risk grouped in final model (N=29), 2009 data

CCS	N with CCS	% with CCS	N readmitted	% readmitted
9 Sexually transmitted infections (not HIV or hepatitis)	256	0.01%	40	15.63%
20 Cancer; other respiratory and intrathoracic	25	<0.01%	6	24.00%
22 Melanomas of skin	111	0.01%	22	19.82%
26 Cancer of cervix	90	<0.01%	24	26.67%
31 Cancer of other male genital organs	35	<0.01%	6	17.14%
36 Cancer of thyroid	83	<0.01%	17	20.48%
45 Maintenance chemotherapy; Radiotherapy	43	<0.01%	10	23.26%
46 Benign neoplasm of uterus	96	<0.01%	15	15.63%
53 Disorders of lipid metabolism	24	<0.01%	5	20.83%
87 Retinal detachments; defects; vascular occlusion; and retinopathy	90	<0.01%	19	21.11%
88 Glaucoma	31	<0.01%	5	16.13%
92 Otitis media and related conditions	224	0.01%	54	24.11%
124 Acute and chronic tonsillitis	20	<0.01%	7	35.00%
169 Endometriosis	16	<0.01%	4	25.00%
171 Menstrual disorders	53	<0.01%	17	32.08%
172 Ovarian cyst	99	<0.01%	17	17.17%
206 Osteoporosis	94	<0.01%	21	22.34%
208 Acquired foot deformities	497	0.02%	41	8.25%
216 Nervous system congenital anomalies	39	<0.01%	9	23.08%
247 Lymphadenitis	74	<0.01%	15	20.27%
258 Other screening for suspected conditions (not mental disorders or infectious disease)	120	0.01%	24	20.00%
650 Adjustment disorders	296	0.01%	37	12.50%
658 Personality disorders	110	0.01%	17	15.46%
662 Suicide and intentional self-inflicted injury	12	<0.01%	4	33.33%
Total**	2548	0.12%	439	17.23%

**10 beneficiaries were included in this category from five CCS: 30 Cancer of testis; 181 Other complications of pregnancy; 195 Other complications of birth, puerperium affecting management of mother; 255 Administrative/social admission; 256 Medical examination/evaluation.

SOURCE: RTI Analysis of 2009 MedPAR data (output: readmit107_idxSNF02_BiVar_Descript_Model_nomiss_2009.xls)

2.5.4 Comorbidities

To select comorbidities, we ran the model controlling for the demographic and clinical factors, the individual CCS and the two groups of CCS, and evaluated the HCCs individually

instead of as groupings.[19] We reviewed the beta coefficients and p-values for the three model years (2009, 2010, and 2011) and for each of the HCCs to determine whether to include the individual HCC, an HCC grouping, or to exclude the HCC from the final model. We gave consideration to the consistency of effect patterns across the years and the number of patients with the comorbidity. We selected the final set of HCC variables based on the following principles:

i. We excluded HCCs that were not consistently significant across all three years.

ii. We excluded HCC groupings that were predominantly protective and likely reflected coding practices, rather than patient clinical condition. It is possible certain comorbidities (e.g., osteoporosis and other bone/cartilage disorders [HCC 43]) appeared to be protective because they were coded more often in healthier patients who had fewer severe comorbidities than sicker patients who had more competing comorbidities to include on the billing form.

Our review indicated that we should include 70 individual HCCs and two groupings of HCCs.

Additionally, we needed to take into account potential non-linear effects of multiple comorbidities. RTI considered various options for accounting for the total patient burden of comorbidities in the final model, including interactions among the HCCs or including a variable that counts the number of HCCs each patient had over the previous 12 month period. We evaluated these different approaches, including modeling two-way interactions among HCCs with larger predictive effects, and found that using counts in the model had more consistent and significant predictive effects. We further evaluated the functional form of the variable, allowing for the possibility of a non-linear relationship between the count of comorbidities and risk for readmission. We tested a continuous form with a quadratic term to handle nonlinearity, and a categorical variable with cut points selected based on an examination of rates of readmission by count of comorbidities. Our final model uses a continuous variable starting with two HCCs and the square of this variable. See ***Appendix C Table C1*** for the results from our final model for the SNFRM.

We conducted preliminary analyses to compare hierarchical logistic regression model estimates with single-level logistic regression model estimates and found the coefficients were very close across the two models. Thus we felt comfortable building the initial risk adjustment models using logistic regression, reducing the need for greater computational intensity of hierarchical modeling while model building.

[19] Two HCC groupings were retained from our prior cohort modeling work, because of small numbers for some component HCCs: Advanced Chronic Kidney Disease and Dialysis (134,135,136,137), and Cerebral Hemorrhage, Ischemic or Unspecified /Stroke (99, 100)

2.6 Statistical Approach to Measure Calculation

2.6.1 Model Development

For model development, we used logistic regression models with a logistic link function, with outcome Y_i for the i^{th} patient equal to 1 if the patient was readmitted within 30 days of discharge and 0 otherwise (Horwitz et al., 2012). In contrast to the final models described below for calculating the measure, logistic regression models are substantially less computationally intensive, and development using models with fully specified error structures would have taken a very long time. Also, by using logistic regression models, we were able to assess risk factors and model performance without having to deal with variation in performance across SNFs.

For our final models we added an error term to the logistic regression models in addition to the error term associated with the individual observations. Because of the natural clustering of observations within SNFs, we used hierarchical logistic regression to model the log-odds of readmission for each index SNF stay. We modeled readmission within 30 days as a function of patient-level demographic and clinical characteristics with a random SNF-level intercept. This accounts for within-SNF correlation of the observed outcomes as well as the underlying differences in quality among the SNF facilities being evaluated.

Specifically, we estimated a hierarchical logistic regression model as follows. Let Y_{ij}, denote the outcome (equal to 1 if $patient_i$ is readmitted within 30 days, zero otherwise) for a patient i at SNF_j; Z_{ij} denotes a set of risk factors. We assume the outcome is related linearly to the covariates via a logit function with dispersion:

$$\text{logit}(\text{Prob}(Y_{ij}=1)) = \alpha_j + \beta * Z_{ij} + \varepsilon_{ij} \quad (1)$$

$$\alpha_j = \mu + \omega_j \,;\, \omega_j \sim N(0, \tau^2)$$

where $Z_{ij} = (Z_1, Z_2, \ldots Z_k)$ is a set of *k* patient-level covariates. α_j represents the SNF specific intercept; μ is the adjusted average outcome over all SNFs; and τ^2 is the between SNF variance component and $\varepsilon \sim N(0,\sigma^2)$ captures any over- or under-dispersion.

The hierarchical logistic regression model was estimated using the SAS software (SAS GLIMMIX: SAS/STAT User's Guide, SAS Institute Inc.).

2.6.2 Calculating the Standardized Risk Ratio (SRR) and Risk-Standardized Readmission Rate (RSRR)

We specified and estimated the risk adjustment model using hierarchical logistic regression to calculate a standardized risk ratio (SRR) for each SNF.(Horwitz et al., 2012) We used the results from the hierarchical logistic regression model to calculate the predicted and the expected number of readmissions for each SNF. The predicted number of readmissions for each SNF was calculated as the sum of the predicted probability of readmission for each patient in the facility, including the SNF-specific (random) effect.

Using the notation of the previous section, the risk standardized readmission rate for each SNF is calculated as follows. To calculate the predicted number of readmissions $pred_j$ for index SNF stays at SNF*j*, we used

$$pred_j = \Sigma logit^{-1}(\mu + \omega_i + \beta * Z_{ij}) \quad (2)$$

where the sum is over all stays in SNF*j*, and ω_i is the random intercept. To calculate the expected number exp_j we used

$$exp_j = \Sigma logit^{-1}(\mu + \beta * Z_{ij}) \quad (3)$$

As a measure of excess or reduced readmissions among index stays at SNF*j*, we calculated the standardized risk ratio SRR_j as

$$SRR_j = pred_j/exp_j \quad (4)$$

This value, SRR_j, is the standardized risk ratio for SNF*j*. The standardized risk ratio, SRR_j, is multiplied by the overall national raw readmission rate for all SNF stays, $\bar{Y}$, to produce the risk-standardized readmission rate ($RSRR_j$).

$$RSRR_j = SRR_j * \bar{Y} \quad (5)$$

2.6.3 Creating Interval Estimates

Because the RSRR statistic described in Equation (5) is a complex function with no analytical form for the interval of uncertainty, bootstrapping was used to derive interval estimates for the final risk-standardized rate to characterize the uncertainty around each of the SNFs' RSRRs. The list of SNFs was repeatedly sampled with replacement to produce 2,000 bootstrap samples of facilities and their patients for this analysis. Each sample produced an estimate of the RSRR for each included facility. The estimates were ordered and the values delimiting the upper and lower 2.5 percent of the estimates demark the 95 percent confidence interval for the full sample RSRR.

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SECTION 3
RESULTS

This section presents results of the analyses conducted for the SNFRM, including facilities' readmission rates, reliability and validity testing.

3.1 Final Model Results

We used hierarchical, multivariate risk-adjustment models to derive the facility-level 30-day readmission rate. The measure is not an estimate based on samples; rather it includes all SNF patients nationwide who meet the inclusion criteria. As such, the measure is valid in terms of discriminating performance and can be used for inter-facility comparisons. Full model results are included in ***Appendix C***. The model yielded an overall C-statistic of 0.67. Below we report the results of analyses on facilities' readmission rates.

3.1.1 Distribution of Unadjusted and Adjusted Readmission Rates

The distribution of the RSRR is shown in ***Table 7***. The unadjusted readmission rates range from 0.0 percent to 63.5 percent, with a median of 20.0 percent and an interquartile range of 15.6 percent to 24.5 percent. The RSRR, compared to the observed unadjusted rate, had a narrower range, from 11.9 percent to 41.7 percent, with a slightly higher median of 21.0 percent and a tighter interquartile range of 19.4 percent to 22.9 percent. The mean RSRR (21.3%) was also slightly higher than the unadjusted rate (20.3%) and the scores had a much smaller standard deviation (2.7% vs. 7.0%).[20] The RSRR had a mean of 21.3 percent (SD: 2.7) and a range from 11.9 percent to 41.7 percent, with a slightly lower median of 21.0 percent and an interquartile range of 3.5 percent. Facilities with fewer than 25 stays (2037, or 12.2% of SNFs) were excluded from this model summary, because of instability in their observed readmission rates.

There was no evidence of a ceiling effect for this measure. The interquartile range shows that there was clustering in the middle of the distribution. This is in part attributable to the shrinkage of RSRR scores towards the mean, though the risk adjustment itself can reduce the spread. The distribution of the unadjusted and SNF-level RSRR is also illustrated in ***Figures 3*** and ***4***, respectively, where the vertical axis indicates the percentage of SNFs and the horizontal axis the RSRR.

[20] SOURCE: RTI International analysis of 2011 MedPAR data. (output: readmit110_HLMFinal_RiskEstDescript01_2011.xls)

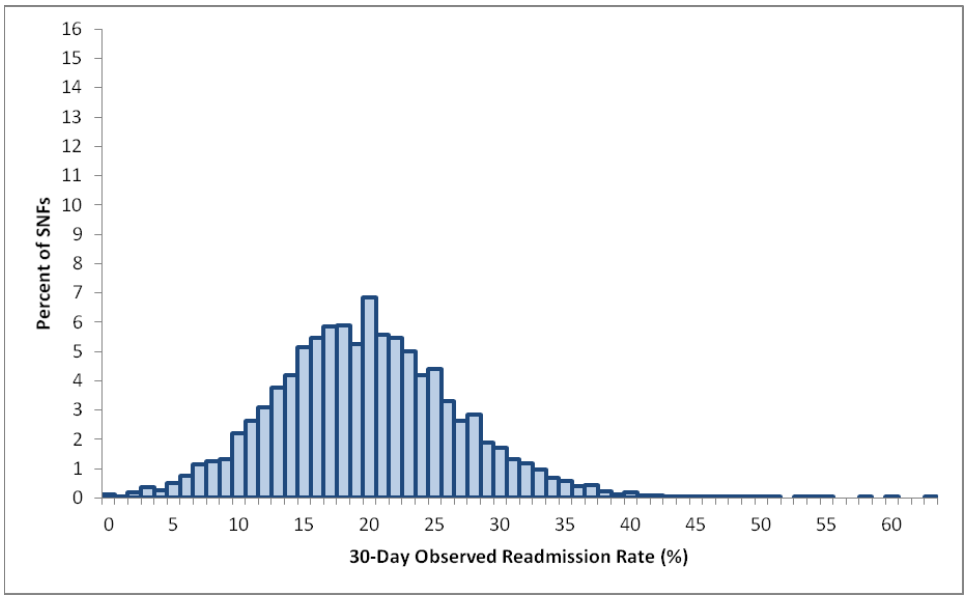
Table 7
Distribution of unadjusted and risk-standardized readmission rates among SNFs with at least 25 index stays, 2011

	Mean	Std Dev	Min	10th Pctl	25th Pctl	Median	75th Pctl	90th Pctl	Max
Unadjusted	20.3	7.0	0.0	11.7	15.6	20.0	24.5	29.1	63.5
Risk-standardized	21.3	2.7	11.9	18.1	19.4	21.0	22.9	24.8	41.7
Count of SNF stays	148.7	133.0	25	38	60.5	108	190	309	1,912

NOTE: N (facilities) = 14,720

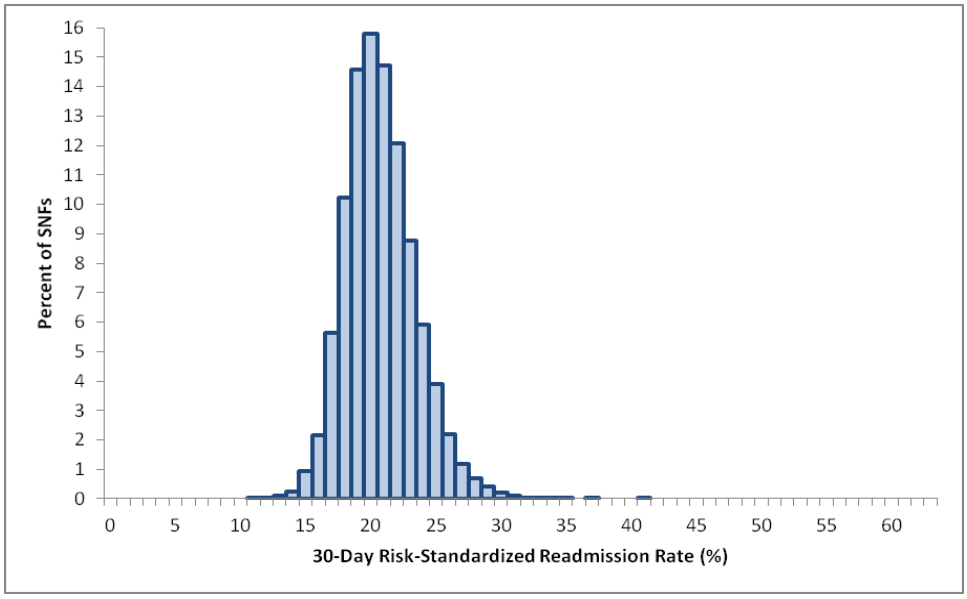
SOURCE: RTI International analysis of 2011 MedPAR data. (output: readmit110_HLMFinal_RiskEstDescript01_2011.xls)

Figure 3
Distribution of Observed Readmission Rates among SNFs with at least 25 index stays, 2011 [N=14,720; Mean (SD) 20.3 (7.0)]



SOURCE: RTI analyses of 2011 MedPAR files (N=14,720 facilities with at least 25 SNF stays). (output: readmit110_HLMFinal_RiskEstDescript02_Histograms_2011.xls)

Figure 4
Distribution of RSRRs among SNFs with at least 25 index stays, 2011 [N=14,720; Mean (SD) 21.3 (2.7)]



SOURCE: RTI analyses of 2011 MedPAR files (N=14,720 facilities with at least 25 SNF stays). (output: readmit110_HLMFinal_RiskEstDescript02_Histograms_2011.xls)

3.2 Ability to Identify Differences among Providers

For several publicly reported readmission measures of hospital outcomes developed with similar methodology, CMS currently generates an interval estimate for each risk-standardized rate. By calculating this interval, the amount of uncertainty associated with the rate can be characterized and comparisons to the national crude rate for the outcome can be made. CMS categorizes hospitals as "better than," "worse than," or "no different than" the US national rate. However, the decision to publicly report this measure and the approach to discriminating performance has not been determined.

To identify meaningful differences in performance between providers, we estimated 95 percent confidence intervals around the providers' scores allowing for comparison with the national average. These results are summarized in ***Table 10*** below.

Table 10
Percent of SNFs statistically significantly different from national mean, overall and by deciles of facility denominator count

Volume Deciles (min-max)	Number of facilities	Number significantly different	Percent significantly different	Percent significantly higher (worse)	Percent significantly lower (better)	Mean Risk Standardized Rate (RSRR)
Decile 1 (1-21)	1,632	1,500	91.9%	31.5%	60.4%	20.9
Decile 2 (22-37)	1,683	1,588	94.4%	35.5%	58.9%	20.8
Decile 3 (38-53)	1,689	1,622	96.0%	39.1%	57.0%	20.8
Decile 4 (54-72)	1,701	1,631	95.9%	40.5%	55.4%	20.8
Decile 5 (73-94)	1,637	1,582	96.6%	43.2%	53.5%	21.0
Decile 6 (95-119)	1,663	1,585	95.3%	46.2%	49.1%	21.3
Decile 7 (120-153)	1,659	1,601	96.5%	47.6%	48.9%	21.2
Decile 8 (154-201)	1,658	1,609	97.0%	49.6%	47.4%	21.3
Decile 9 (202-294)	1,671	1,626	97.3%	51.5%	45.8%	21.4
Decile 10 (205-1912)	1,663	1,619	97.4%	61.2%	36.1%	22.2
Overall	16,656	15,963	95.8%	44.6%	51.2%	21.2

SOURCE: RTI analysis of 2011 MedPAR data (readmit134_BSWalt_ConfInt_2011_fin_by_rank.xls).

We found that 95.8 percent of nursing facilities overall were statistically significantly different than the national average RSRR. The percent of nursing facilities that were

significantly different increased as facility size increased; for example, 91.9 percent of nursing facilities in the smallest decile based on volume was significantly different compared to 97.4 percent significantly different in decile 10, the largest facilities. Larger facility patient volumes tend to lead to greater precision, tighter confidence intervals, for the estimates.

The last two columns present the percent that were significantly higher (worse) and significantly lower (better) than average. Across all deciles, the proportion of nursing facilities with scores significantly better than the national average decreased as the volume of SNF stays decreased, with 60.4 percent of the smallest facilities having higher than average RSRRs, as compared to just 36.1 percent of the highest volume SNFs.

Though the policy decision has not yet been determined by CMS in terms of how SNF readmission rates may be reported with respect to SNFs nationally, results of the bootstrapping analyses suggest the ability to discriminate between providers' performance for this readmission measure. The lower precision of RSRRs for SNFs with fewer stays suggests that public reporting might incorporate a minimum reporting threshold; however, this policy decision has not been determined.

3.3 Model Validation

Using logistic regression results, we computed five summary statistics to assess model performance:

(1) calibration (a measure of over-fitting);
(2) discrimination in terms of predictive ability;
(3) discrimination in terms of the C-statistic (equivalent to area under the receiver operating characteristic [ROC] curve);
(4) distribution of residuals; and
(5) model chi-square.

Further justification for our risk adjustment model can be seen from ***Table 8***, which provides calibration results for the three model years of data we analyzed: 2009, 2010, and 2011.

Over-fitting refers to the phenomenon in which a model fails to generalize to new data because it has been too closely "tuned" to chance variation in the development dataset. We looked at two indices of over-fitting, γ_0 and γ_1. The former should be close to zero and the latter close to one in a model that is not over-fit. Our statistics matched these expectations suggesting there is no evidence of over-fitting. Discrimination in predictive ability assesses the ability to distinguish high-risk from low-risk subjects.

As shown in ***Table 7***, each year's model demonstrates good discrimination, as in each case there is a wide range between the mean predictive probability in the lowest decile versus the highest decile. The C-statistic is a measure of how accurately a statistical model is able to distinguish between a patient with and without an outcome. For binary outcomes the C-statistic is identical to the area under an ROC curve for the model. A C-statistic of 0.50 indicates random prediction, implying the model predicts no better than random chance. A C-statistic of 1.0 indicates perfect prediction, implying the model is perfectly predictive. In these models, each C-

statistic is 0.67, which is in line with observed results for other 30-day readmission measures. The distribution of residuals shows results very similar to the HWR models that Yale developed.

Finally, the Likelihood Ratio model chi-squares show the overall model fit from year to year, but with these large sample sizes, this statistic is less informative. These summary statistics provide further justification for the fit and predictive ability of our risk adjustment model in profiling SNFs by the measure of risk standardized 30-day readmission rate.

Table 8
Model calibration results for 2009, 2010, and 2011 analytic files created from the MedPAR data files

Indices	2009	2010	2011
Calibration (γ_0, γ_1) from regression readmission = $\gamma_0 + \gamma_1 *$ predicted	(0,1)	(0,1)	(0,1)
Discrimination - C-statistic	0.666	0.667	0.667
Distribution of residuals (% Pearson Residual Falling in range)			
<-2	0	0	0
-2 to <0	78	79	79
0 to <2	15	14	14
>2	7	7	7
Model x^2 (DF)*	130666 (309)	131205 (309)	131044 (309)

SOURCE: RTI analysis of 2009, 2010, 2011 MedPAR data (programs: readmit104_idxSNF02_LogRegFinal_02.sas, readmit104_idxSNF02_LogRegFit_03.sas)

A test that explores calibration over ranges of predicted probabilities is a comparison of the observed and predicted readmissions by decile. Results from this test for the 2011 model are reported in ***Table 9***. These results indicate that the difference between the predicted number of readmissions and the observed number of readmissions in percentage points is minimal, less than one percentage point across deciles of expected rates of readmission.

Table 9
SNF Readmission model diagnostics: comparison of observed and predicted readmissions by expected readmission deciles – 2011

Decile based on Expected (Low to high)	Number of SNF Stays	Number of Observed Readmissions	Number of Predicted Readmissions	Difference: Predicted – Observed (% points)
1	221,539	16,219	16,886.64	0.30%
2	221,540	24,341	24,748.81	0.18%
3	221,540	29,794	29,986.13	0.09%
4	221,540	35,047	34,997.32	-0.02%
5	221,540	40,637	40,129.95	-0.23%
6	221,540	45,953	45,744.10	-0.09%
7	221,540	52,357	52,116.72	-0.11%
8	221,540	60,714	59,803.96	-0.41%
9	221,540	70,866	70,186.95	-0.31%
10	221,539	91,179	92,506.41	0.60%

SOURCE: RTI analysis of MedPAR data, 2011. (output: readmit143_idxSNF02_DecileExp.xls).

3.4 Reliability Testing

This section reports results of the reliability analyses conducted including the methods, sample, results, and discussion. Reliability testing was conducted at the data element and the performance measure levels, as described below.

3.4.1 Methods for Data Element Reliability

To enhance the reliability of the model, RTI chose the data elements considered most robust and reliable from prior research using the source data to build the sample and include in the model. Wherever possible, we approached variable selection for development of the SNFRM to harmonize with the construction of the HWR (NQF #1789). In employing this

approach, we cite the same justification used for the HWR with regard to reliability of data elements used. Similar to NQF #1789, we selected data elements focusing on variables that are likely to be coded more consistently across hospitals and SNFs because they are used for payment or are audited. For example, consistent with the HWR, we used admission and discharge dates on SNF and hospital claims to identify transfers and readmissions, rather than relying on the claim "discharge disposition" items. We also note that CMS has an audit process in place for hospitals that includes review of diagnosis and procedure codes (NQF #1789).

Additionally, we examined the consistency of covariate prevalence and odds ratio estimates and confidence limits over the three years of files constructed (2009 – 2011). We also compared the consistency of odds ratio estimates for the two split sample files.

3.4.2 Statistical Results from Data Element Reliability Testing

We found no notable differences in the prevalence of covariates. After making pairwise comparisons of odds ratios between each of the three file years, there were only three instances where odds ratios were found to be significantly different between pairs of years, based on comparisons of the 95 percent confidence intervals (CCS3 Bacterial infection, when comparing 2009 to 2011; CCS130 Pleurisy, pneumothorax, when comparing 2009 to 2010; HCC8 Metastatic Cancer and Acute Leukemia, when comparing 2009 to 2011). See ***Table C1***, in ***Appendix C***, for the full models and results for all three file years analyzed.

For the split sample files, we only found two conditions where the odds ratios were significantly different between files (CCS1 Tuberculosis and CCS28 Cancer of other female genital organs).[21] Tuberculosis was a fairly low prevalence condition (0.1% of each of the 2009 and 2010 samples), and was associated with rates of readmission of 24 percent in 2009 and 27 percent in 2010. Cancer of other female genital organs were also low prevalence (0.1% of each of the 2009 and 2010 samples), and were associated with rates of readmission of 27 percent in 2009 and 22 percent in 2010.

3.4.3 Methods for Performance Measure Reliability

To evaluate the reliability of the quality measure, we followed the test-retest approach used in the evaluation of the HWR. This approach involved examining the level of agreement between facilities' scores when calculated based on two mutually exclusive random samples of patients within each facility. We combined the 2009 and 2010 files and took a random sample at the patient level, splitting the combined years into two halves. We recalculated the SRR for each facility for each data set. The level of agreement between the two measures calculated on the two different samples gave us a test of the repeatability of the measure. Agreement was evaluated using intraclass-correlation (ICC) with the SNF as the cluster, calculated assuming a random subset of all possible raters.[22]

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[21] Source: RTI analysis of 2009 and 2010 MedPAR data (output: readmit108_HLMFinal_split_01_OddsRatioCompare.xlsx)

[22] Shrout PE, and Fleiss JL Intraclass correlations: uses in assessing rater reliability. Psychological Bulletin. 1979, 86, 420-428.

3.4.4 Data Sample for Reliability Testing

Consistent with the reliability testing done for the HWR measure (NQF #1789), we pooled the data sets for 2009 and 2010, splitting the file randomly within facility at the patient level into two data sets. The two data sets derived from the two years of pooled data were used for test-retest reliability testing, and the third year (2011) was used to assess stability over time. The final analytic files included 16,890 SNFs reporting over 2009 and 2010, and had the following counts of patients:

Split Sample 1: 2,196,165 index SNF stays in 16,821 facilities

Split Sample 2: 2,196,066 index SNF stays in 16,890 facilities[23]

3.4.5 Results for Performance Measure Reliability

Examining the level of agreement between SRR scores calculated on each of the split files, we found an ICC of 0.56,[24] indicating a moderate level of agreement between facilities' SRRs. When stratified by quartile of SNF count of stays in Sample 1, the observed ICCs on the split sample comparison was as follows:

SNFs with 1-44 stays (n = 4130 SNFs), ICC=0.30

SNFs with 45-91 stays (n = 4227 SNFs), ICC=0.45

SNFs with 92-171 stays (n = 4244 SNFs), ICC=0.53

SNFs with 172-1510 stays (n = 4220 SNFs), ICC=0.70[25]

Agreement across file years was similar (ICC = 0.59 comparing 2009 to 2010; ICC = 0.56 comparing 2010 to 2011).[26]

In summary, the results of these analyses suggest moderate agreement for test-retest reliability and increasing levels of agreement among larger facilities.

3.5 Validity Testing

We conducted validity testing to assess the relationship between the SNFRM to individual outcome and process measures and to the Five-Star Nursing Home Compare rating. In this section we reports results of these validity analyses, including a description of the methods, sample, results as well as the interpretation of these results and summary of the validity testing.

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[23] Source: RTI analysis of 2009 and 2010 MedPAR data (output: readmit108_HLMFinal_split_01_OddsRatioCompare.xlsx). The larger sample in sample 2 is 69 singular SNFs with small sample sizes (1-2 stays each).

[24] Source: RTI analysis of 2009 and 2010 MedPAR data (output: readmit111_HLMFinal_ICC_split_01_SRR.xls)

[25] Source: RTI analysis of 2009 and 2010 MedPAR data (output:readmit111_HLMFinal_ICC_split_05.lst)

[26] Source: RTI analysis of 2009 - 2011 MedPAR data (output: readmit109_HLMFinal_ICC04_SRR_2009-2010.xls; readmit109_HLMFinal_ICC05_SRR_2010-2011.xls)

3.5.1 Methods for Validity Testing

At the performance measure level, we evaluated the relationship between the SNFRM and other current nursing home outcome and process performance measures. We derived the SNFRM values for each facility using the 2011 MedPAR SNF and acute care hospital claims data, described above. There were 2,215,398 SNF index stays identified, from 16,656 SNFs.

We selected the four NQF-endorsed MDS-based quality measures (QMs) designed for measuring quality of care provided for short stay residents and made publicly available on Nursing Home Compare. These measures, listed below, are constructed using MDS 3.0 assessments, which are submitted by nursing homes nationwide.[27] For these measures, individuals are identified as short stay if they have cumulative stays of 100 days or fewer at a nursing home or SNF.

For this analysis, we calculated facilities' mean QM scores for the four quarters of Nursing Home Compare data from 2011 and merged this data with facilities' SNFRM RSRRs. We performed pairwise correlations examining the relationship between the SNFRM and each of these MDS-based QMs.

Facilities included in the analysis were restricted to those with a valid corresponding value in the MDS-based QM file, based on a denominator size that meets the minimum sample size requirement for public reporting on Nursing Home Compare (n = 20). These quality measures and the corresponding count of facilities included in the final merged sample for each correlation are as follows:

- NQF #0676 Percent of residents who self-report moderate to severe pain (short stay):n = 14,989
- NQF #0678 Percent of residents with pressure ulcers that are new or worsened (short stay): n = 14,977
- NQF #0680 Percent of nursing home residents who were assessed and appropriately given the seasonal influenza vaccine (short stay): n = 14,992
- NQF #0682 Percent of residents assessed and appropriately given the pneumococcal vaccine (short stay): n = 14,993

At the measure level, RTI examined whether a facility's score on the SNFRM was correlated with its score on the currently endorsed quality measures using Spearman's rank-order correlation. We used the selected MDS-based NQF endorsed short stay measures, listed above, which are designed for measuring quality of care provided for short stay residents.[28] We used

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[27] MDS 3.0 QM User's Manual is available in the Downloads at the following url: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html

[28] Additional information on the construction of the short stay QM measures is available here: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html

facilities' average QM scores in 2011 for the four NQF-endorsed MDS QMs. These QMs are calculated using MDS 3.0 assessments submitted by nursing homes nationwide.

As QM scores are calculated quarterly, we averaged the four quarters of 2011 to create a file covering the comparable period.

Correlations with the SNFRM were not expected to be uniform across these measures because the strength of the relationships between these measured outcomes and processes and readmissions varies from measure to measure. We expected that the relationship between the vaccination measures (influenza and pneumococcal) and the SNFRM would be stronger than the relationship between the pain and pressure ulcers measures and the SNFRM. This is because respiratory infection is a major preventable reason for readmission among nursing home residents and its prevalence can be influenced by influenza and pneumococcal vaccine administration (MedPAC, 2011). Additionally, we expected the correlations of the SNFRM with the vaccine measures to be negative, as higher scores for the two process measures indicate better quality, whereas lower scores for the SNFRM indicate better quality. Lower scores for the two MDS 3.0 outcomes measures, NQF #0676 and NQF #0678, also indicate better quality, so we expected that any correlation with the SNFRM would be positive. However, we expected that correlations among all of these quality measures would be low, given that prior work assessing the validity of the MDS-based QMs showed low correlation.

Additionally, we examined the relationship between the SNFRM and the summary Five-Star ratings available on Nursing Home Compare (2011 data).[29] These quality components and the corresponding count of facilities included in the final merged sample in each correlation are as follows:

- Overall quality rating: n = 14,880
- Health inspection rating: n = 14,880
- Total Staffing rating: n = 14,733
- Registered Nurse (RN) Staffing rating: n = 14,733

For each SNF, we calculated the mean rating across the twelve months of 2011 for each of the Five-Star scores, excluding months where it was indicated that the SNF was too new to rate, or the data was not available. We then ran a Spearman's rank-order correlation with the SNFRM for each mean rating. We hypothesized, as with the individual outcome and process measures, that the Five-Star ratings would have a low correlation with the SNFRM. Of the Five-Star focus areas, we anticipated that the RN staffing rating would have the highest correlation of the set, given that the availability of skilled services supplied by an RN would likely the most impact on post-acute patients and their risk for readmission. We anticipated that the relationship would be negative, as higher Five-Star ratings indicate higher quality, whereas higher SNFRM scores indicate poorer quality.

[29] http://www.medicare.gov/NursingHomeCompare/About/HowWeCalculate.html

3.5.2 Statistical Results from Validity Testing

Relationship to individual outcome and process measures: We found the following correlations among facility rankings on the four NQF endorsed nursing home short stay quality measures and the SNFRM RSRR.[30]

- NQF #0676 Percent of residents who self-report moderate to severe pain (short stay): -0.028
- NQF #0678 Percent of residents with pressure ulcers that are new or worsened (short stay): 0.016
- NQF #0680 Percent of nursing home residents who were assessed and appropriately given the seasonal influenza vaccine (short stay): -0.081
- NQF #0682 Percent of residents assessed and appropriately given the pneumococcal vaccine (short stay): -0.075
- (p value for all correlations <0.05, except for NQF #0678, where the p value is 0.06)

Relationship to Five-Star Nursing Home Compare ratings: We found the following correlations of the Five-Star Nursing Home Compare ratings with the SNFRM RSRR[31]

- Overall quality rating: -0.096
- Health inspection rating: -0.064
- Total Staffing rating: -0.099
- RN Staffing rating: -0.131
- (p value for all correlations <0.05)

3.5.3 Interpretation of the Results in Terms of Demonstrating Validity

With regard to our analyses of the relationship between the SNFRM and existing NQF endorsed outcome and process measures, as expected the correlations of the SNFRM with all four of the MDS 3.0 measures are low. Correlations with the vaccine measures were negative and relatively higher than with the two outcomes measures as anticipated, though differences in observed correlations may be too small to be considered clinically significant. Although the correlation with self-reported pain (NQF #0678) was unexpectedly negative, the correlations for both the outcome measures with the SNFRM were extremely low. It is possible that because the

[30] Source: RTI Analysis of 2011 MedPAR and MDS 3.0 data (output: readmit116_SNFRMLS08_Validity01_QM-Corrs.xls)

[31] Source: RTI Analysis of 2011 MedPAR and MDS 3.0 data (output: readmit116_SNFRMLS08_Validity02_Rate-Corrs.xls)

pain measure reflects prevalent pain it may actually be capturing a mixture of quality of pain management, and quality of pain monitoring. If the pain measure is picking up quality of monitoring, one might expect better quality nursing homes to have higher rates of reported pain (as reflected in the MDS QM) because of better pain monitoring. These same better quality nursing homes also would have lower rates of readmissions reflected in the SNFRM, resulting in this negative correlation.

With regard to our analyses of the relationship between the SNFRM and the Five-Star Nursing Home Compare ratings, correlations also were low and negative as expected. The correlation with RN staffing was the strongest, as predicted.

The results from these correlations corroborate evidence from SNF studies discussed earlier that show a relationship between improved staffing and other processes and readmission rates.

With regard to the validity of critical data elements, multiple studies have been conducted to examine the validity of using Medicare hospital claims for many of the NQF-endorsed quality measures used in public reporting. Additional studies have been conducted to validate claims for detection of several conditions and procedures. The following NQF endorsed measures make use of Medicare hospital claims in their construction: 30-day all-cause risk-standardized readmission following acute myocardial infarction hospitalization (NQF #0505) (Krumholz et al., 2006), 30-day all-cause risk-standardized readmission following heart failure hospitalization (#0330) (Keenan et al., 2008), pneumonia mortality (NQF #0468) (Bratzler et al., 2011), HWR (NQF #1789), complication following cardioverter-defibrillator implantation (NQF#0694), and complication following total hip or knee arthroplasty (NQF #1551).[32] The models for these measures were validated by comparing claims and abstracted medical chart data.

Additionally, several studies have validated the use of Medicare claims, using a variety of sources to calculate the sensitivity and specificity of claims for identifying a range of diagnoses and procedures. Whittle et al. (1991) evaluated the use of claims compared to Surveillance, Epidemiology, and End Results (SEER) data to estimate incidence rates of breast, colon, and lung cancer (n = 745,283 female beneficiaries for the breast cancer sample, 1,213,533 for the colon and for the lung cancer samples). Whittle et al. found that incidence rates estimated using claims were within six percent of those based on SEER data. Resection rates were lower by 12 to 27 percent. Setoguchi et al. (2007) validated the identification of hematological malignancies and solid tumors in Medicare hospital clams, using cancer registry data for a sample of 157,310 Medicare patients. Results from these analyses suggest Medicare Part A claims are valid for identifying cancer diagnoses (77.4% to 98% sensitivity). Ko et al. (2011) linked Medicare colonoscopy claims (n = 15,168) with Clinical Outcomes National Endoscopic Database records and identified findings and procedures performed during a sample of 15,168 colonoscopies. Upper gastrointestinal events appear to be well-detected by ICD-9 codes and Medicare claims.

[32] Full names: NQF #0505 Hospital 30-Day all-cause RSRR following acute myocardial infarction (AMI) hospitalization; NQF #0330 Hospital 30-day, all-cause RSRR following heart failure hospitalization; NQF #0468 Hospital 30-day, all-cause, risk-standardized mortality rate following pneumonia hospitalization; NQF #1789 Hospital-Wide All-Cause Unplanned Readmission Measure (HWR); NQF #694 Hospital risk-standardized complication rate following implantation of implantable cardioverter-defibrillator; NQF #1551: Hospital-level 30-day, all-cause RSRR following elective primary total hip arthroplasty and/or total knee arthroplasty

In 2007, Noyes et al. compared the specificity of claims linked to the Medicare Current Beneficiary Survey data versus only claims to identify Parkinsonism. Using 72,922 observations from 30,469 individuals, researchers found a 0.99 specificity when identifying Parkinsonism with claims linked to the 1992-2000 Medicare Current Beneficiary database, versus a 0.66 specificity when only claims were used. Noyes et al. (2011) validated Medicare claims for identification of depression among older adults against the Mini-International Neuropsychiatric Interview – Major Depressive Episode Module and the Geriatric Depression Scale for 1,551 patients, and found that Medicare claims underestimate depression prevalence (sensitivity <0.50; specificity >0.70). Losina et al. (2003) compared the ability to identify rheumatologic diagnoses among total hip replacement patients using Medicare claims versus using medical records in a sample of 922 hip replacement patients. The sensitivity was low (54%-65%) but the positive predictive value was high for identifying rheumatoid arthritis. Finally, Taylor et al. (2009) linked Medicare claims to the Aging Demographics and Memory Study to identify patients with dementia using a cohort of 758 individuals and estimated Medicare claims have a sensitivity of 0.85 and a specificity of 0.89.

With regard to the face validity of the SNFRM as an indicator of quality, readmissions have consistently been considered to have value applied to other settings and patient groups. Our technical expert panels, including industry representatives and researchers, are in agreement with the approach. Validity was partially tested by statistical tests of the model on multiple years of data to predict readmissions and through the assistance of a Technical Expert Panel. The risk adjusters are of the type used to predict other measures of utilization (e.g., hospitalizations), Medicare, Medicaid and private payer spending for medical services, and mortality. The spending models are used by the Federal and State governments to determine payments. The model structure and many of the variables are similar to those in the Hospital Wide All-Cause Readmission measure approved by NQF (#1789).

SECTION 4
SUMMARY

Given evidence that nearly one out of every four Medicare beneficiaries discharged from acute care hospitals who subsequently received care in a SNF were readmitted to the hospital within 30 days (Mor et al., 2010), monitoring hospital readmissions of beneficiaries utilizing SNFs is an important policy area for CMS. As part of the Nursing Home Quality Initiative, CMS directed RTI International to develop the SNFRM. The goal of the SNFRM is to measure facility-level readmission rates among beneficiaries utilizing SNF.

The SNFRM is calculated using fee-for-service (FFS) Medicare claims. This measure was designed to harmonize with CMS's current HWR measure (NQF #1789) which estimates the hospital-level, risk-standardized rate of unplanned, all-cause readmissions within 30 days of a hospital discharge. The SNFRM uses the same 30-day risk window as the HWR. The SNFRM is also harmonized with readmission measures being developed for other PAC settings, such as IRFs and LTCHs.

The SNFRM was endorsed by the NQF in December 2014 (NQF #2510). However, like several other readmission and hospitalization measures that received endorsement by NQF at that time, the SNFRM was entered into a trial period in order to undergo additional testing for unintended consequences and risk-adjustment for sociodemographic status factors. Despite initial NQF endorsement of this measure, development and testing for the SNFRM continues. RTI, as measure developers, will continue testing and maintaining this measure as needed.

Hospital readmissions among the sizeable proportion of SNF beneficiaries that use SNFs continues to be a key policy area for CMS. Recent legislation mandates additional work by CMS in this area. For example, the Protecting Access to Medicare Act of 2014 and the Improving Post-Acute Care Transformation Act both require hospital readmission measures for SNFs. The former requires SNF value-based purchasing to use an all-cause hospital readmission measure as an initial performance measure, and the latter requires development of a potentially preventable readmission measure for SNFs. Continued refinement and development of readmission measures for SNFs is underway, and the SNFRM will be one of CMS's portfolio of readmission measures for PAC.

This report detailed the development and technical specifications for the SNFRM. This measure estimates the risk-standardized rate of all-cause, unplanned, hospital readmissions for patients who have been admitted to a SNF within 30 days of discharge from their prior proximal hospitalization. The measure is based on FFS claims data for 12 months of SNF admissions. Unplanned readmissions are identified using a modification of the Planned Readmission algorithm from CMS' HWR measure (NQF #1789) with additional procedures added as appropriate for the PAC population.

The numerator of the SNFRM is mathematically related to SNF stays where there was a hospital readmission, but the measure does not have a simple form for the numerator and denominator—that is, the risk adjustment method used does not make the observed stays with readmissions the numerator and a predicted number the denominator. The numerator, as defined, includes risk adjustment for patient characteristics and a statistical estimate of the facility effect

beyond patient mix. The denominator includes all patients who have been admitted to a SNF within 1 day of discharge from a prior proximal hospitalization, taking denominator exclusions into account.

In addition to documenting the outcome definition, the planned readmission approach, inclusion and exclusion criteria, and data sources, we summarized the methods used for model development including the risk-adjustment and statistical approach to calculate facilities RSRR scores. In order to assess comparative performance, we estimated interval estimates using bootstrapping techniques.

Section 3 summarizes the results of the risk-adjustment model, validation, and final model results. We reported the distribution of facilities' RSRRs in comparison with SNFs' unadjusted readmission rates. The mean RSRR was 21.3 percent (SD=2.7%) with a range of 11.9 percent to 41.7 percent, a median of 21.0 percent, and an interquartile range of 3.5 percent. The distribution of the RSRR was much narrower compared to the unadjusted readmission rate. The mean unadjusted readmission rate was 20.3% (SD=7.0%)

This section also summarized results of the reliability and validity testing. Specifically, we assessed five measures for model validation, including: calibration (a measure of over-fitting); discrimination in terms of predictive ability; discrimination in terms of the C-statistic; distribution of residuals; and model chi-square. We assessed some of these validation measures by deciles of SNF size. Each year's model demonstrates good discrimination, as in each case there is a wide range between the mean predicted probability in the lowest decile versus the highest decile based on SNF size. In these models, for each of 3 years, the C-statistic is 0.67, which is in line with observed results for other 30-day readmission measures. The distribution of residuals shows results very similar to the HWR models that Yale developed for CMS. Finally, the Likelihood Ratio model chi-squares show the overall model fit from year to year, but with these large sample sizes, this statistic is less informative. These summary statistics provide further justification for the fit and predictive ability of our risk adjustment model in profiling SNFs by the measure of risk standardized 30-day readmission rate.

We used bootstrapping techniques to estimate confidence intervals around SNFs' RSRRs. We found that 96 percent of nursing facilities overall were significantly different than the national average RSRR. The percent of nursing facilities that were significantly different increased as facility size increased; for example, 92 percent of nursing facilities in the smallest decile based on volume was significantly different compared to 97 percent significantly different in decile 10, the largest facilities.

Results of test-retest reliability were moderate and showed increasing levels of agreement among larger facilities. With regard to our validity analyses of the relationship between the SNFRM and existing NQF endorsed outcome and process measures, as expected the correlations of the SNFRM with all four of the MDS 3.0 measures are low. As expected, correlations were also low and negative in analyses of the relationship between the SNFRM and the Five-Star Nursing Home Compare ratings. The correlation with RN staffing was the strongest. Results from these correlations corroborate evidence from SNF studies discussed earlier that show a relationship between improved staffing and other processes and readmission rates.

With regard to the validity of critical data elements, multiple studies have been conducted to examine the validity of using Medicare hospital claims for many of the NQF-endorsed quality measures used in public reporting. Finally, in terms of face validity of the SNFRM as an indicator of quality, readmissions have consistently been considered to have value applied to other settings and patient groups. Our technical expert panels, including industry representatives and researchers, supported this approach.

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APPENDIX A
OBSERVATION STAYS

This measure does not include observation stays as a readmission because there were few observation stays in comparison to the number of inpatient admissions and very few readmissions after an observation stay. In a recently published analysis, researchers at Brown University evaluated how frequently SNF patients had observation stays with and without formal admission to the hospital (Feng et al., 2012). In 2009, of the approximately 2.5 million SNF stays among FFS Medicare beneficiaries aged 65+ nationwide, there were roughly 18,000 observation stays (0.7%) and few readmissions within 30 days after the observation stay (Feng, 2012). The results indicated that the vast majority of hospital observation stays in 2009 (over 1 million in total) originated from the community (83% from community without home health care and 8% from community with home health care). Only a small number and proportion of observation stays originated from a SNF (i.e., were preceded immediately by a SNF stay): N=17,731 or 1.7 percent of all observation stays, nationally. Consistent with the pattern of their origins, the vast majority of hospital observation stays were discharged to the community (80% without home health and 11% with home health care). Again, only a small number and proportion of observation stays were discharged to a SNF (regardless of their origin): N=25,884, or 2.6 percent of all observations stays (Feng, 2012). These results suggest that excluding hospital observation stays from the SNF hospital readmission measure will not make a meaningful difference in the SNF facility-level rate of hospital readmissions or in the relative ranking of SNF providers according to this measure.

Second, although the overall prevalence of hospital observation stays has been on the rise, raising legitimate concerns about their causes and consequences, the number of observation stays that originated from and were subsequently discharged to SNF settings is very small relative to other settings (mostly community). A recent report by the Office of Inspector General shows that this trend has indeed continued in more recent years. According to this report, Medicare beneficiaries had 1.5 million observations stays in 2012 and an additional 1.4 million long outpatient stays that lasted at least one night but were not coded as observation stays (Wright, 2013). However, this study did not break down the data by setting, that is, the setting from which observation patients came. Based on our preliminary analysis results above, we emphasize that despite an increasing number of Medicare beneficiaries held for observation in hospitals at the national level, the vast majority of them are from community settings, and relatively few come from or are discharged to SNFs. CMS and the measure developers (RTI International) agree that the rising trend of hospital observation stays is an important issue that warrants continuous monitoring and policy attention.

Third, and perhaps most importantly, mingling outpatient observation stays with inpatient admissions raises serious questions as to whether other types of hospital outpatient stays, such as emergency department (ED) visits or prolonged outpatient stays other than observation care in the hospital, should also be counted as admissions. RTI argues that this could not only introduce bias into the measure from a technical and conceptual perspective but also send a mixed signal to SNF providers and hospitals, with the potential to compromise patient care. For SNFs, their 30-day readmission rate would increase more or less depending on how many of their patients were sent back to the hospital via the ED and held for observation within the 30-day tracking window.

Counting observation stays in the SNFRM could potentially increase perverse incentives already identified as a general concern with public reporting of any quality measure. Namely, SNFs may have an incentive *not* to send patients to the ED even though the patients truly require hospital care, or may deliberately postpone doing so until after the 30-day measurement period ends to lower their publically reported readmission rate. Including observation stays in the measure could potentially add to these incentives.

The increased use of hospital observation stays as outpatient care is an important issue that may have a significant adverse impact on Medicare beneficiaries. Observation stays may reduce eligibility for SNF services because of lack of a qualifying prior acute admission and therefore increase out-of-pocket spending. However, when looking at SNF readmissions, the absolute number and percentage share of observation stays involving Medicare beneficiaries in the SNF setting are small relative to other settings. Most importantly, there remain significant conceptual and practical challenges in the consideration of counting observation stays in the SNFRM. A decision to do so would require a better understanding of possible negative consequences, including postponing transfer of SNF patients to the ED.

APPENDIX B
PLANNED READMISSION ALGORITHM (TABLES B1-B5)

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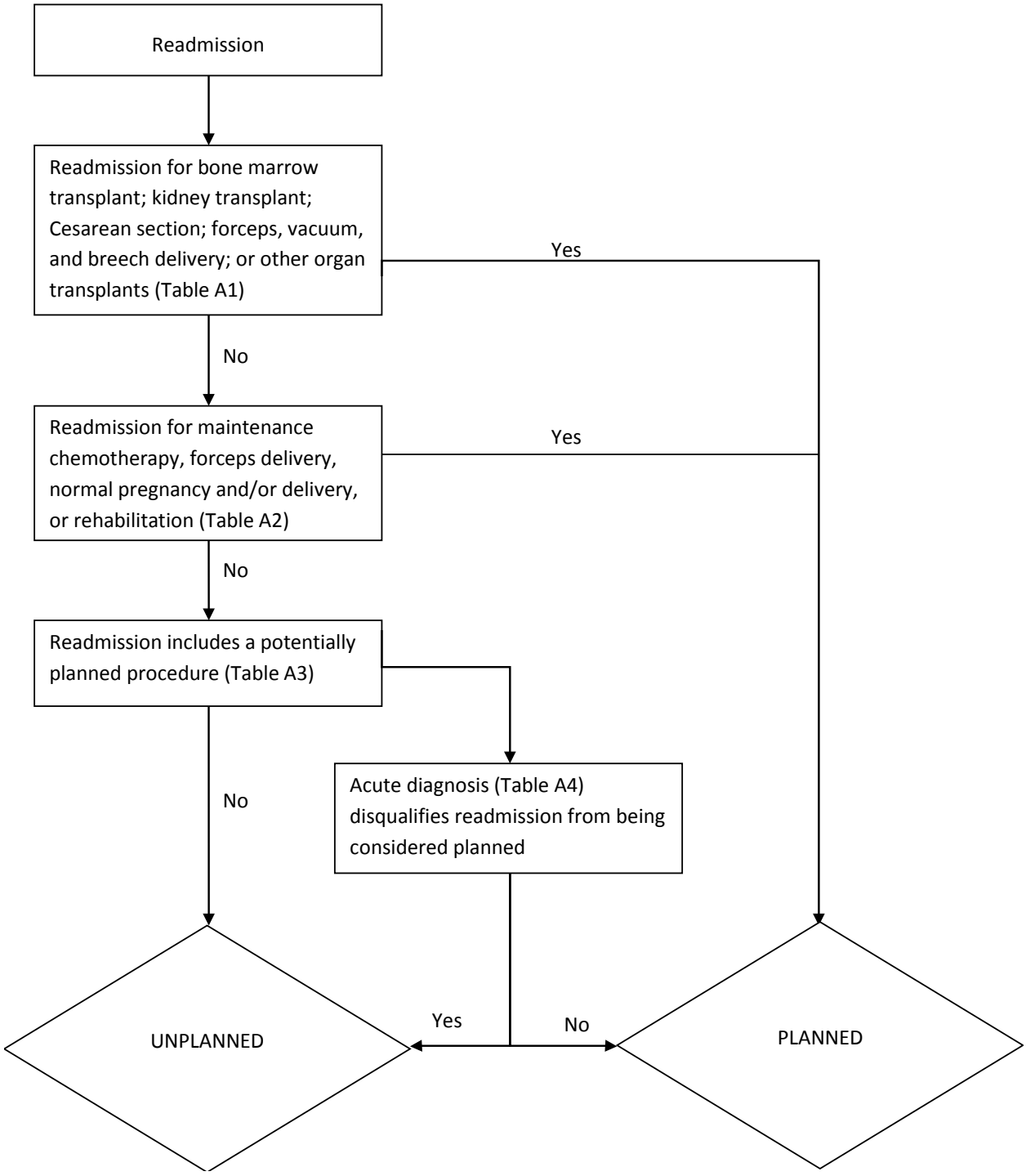
Planned Readmission Algorithm[33]



[33] Adapted from Yale, 2012

Table B1
Procedure categories that are always planned regardless of diagnosis procedure

AHRQ CCS Procedures	Name
64	Bone marrow transplant
105	Kidney transplant
134	Cesarean section
135	Forceps; vacuum; and breech delivery
176	Other organ transplantation

Table B2
Diagnosis categories that are always planned regardless of procedure

AHRQ CCS Diagnoses	Name
45	Maintenance chemotherapy
194	Forceps delivery
196	Normal pregnancy and/or delivery
254	Rehabilitation

Table B3
HWR planned procedures

AHRQ CCS Procedures	Name
3	Laminectomy; excision intervertebral disc
5	Insertion of catheter or spinal stimulator and injection into spinal
9	Other OR therapeutic nervous system procedures
10	Thyroidectomy; partial or complete
12	Other therapeutic endocrine procedures
33	Other OR therapeutic procedures on nose; mouth and pharynx
36	Lobectomy or pneumonectomy
38	Other diagnostic procedures on lung and bronchus
40	Other diagnostic procedures of respiratory tract and mediastinum
43	Heart valve procedures
44	Coronary artery bypass graft (CABG)
45	Percutaneous transluminal coronary angioplasty (PTCA)
47	Diagnostic cardiac catheterization; coronary arteriography
48	Insertion; revision; replacement; removal of cardiac pacemaker or cardioverter/defibrillator
49	Other OR heart procedures
51	Endarterectomy; vessel of head and neck
52	Aortic resection; replacement or anastomosis
53	Varicose vein stripping; lower limb
55	Peripheral vascular bypass
56	Other vascular bypass and shunt; not heart
59	Other OR procedures on vessels of head and neck
62	Other diagnostic cardiovascular procedures
66	Procedures on spleen
67	Other therapeutic procedures; hemic and lymphatic system
74	Gastrectomy; partial and total
78	Colorectal resection
79	Local excision of large intestine lesion (not endoscopic)
84	Cholecystectomy and common duct exploration
85	Inguinal and femoral hernia repair

(continued)

Table B3 (continued)
HWR planned procedures

AHRQ CCS Procedures	Name
86	Other hernia repair
99	Other OR gastrointestinal therapeutic procedures
104	Nephrectomy; partial or complete
106	Genitourinary incontinence procedures
107	Extracorporeal lithotripsy; urinary
109	Procedures on the urethra
112	Other OR therapeutic procedures of urinary tract
113	Transurethral resection of prostate (TURP)
114	Open prostatectomy
119	Oophorectomy; unilateral and bilateral
120	Other operations on ovary
124	Hysterectomy; abdominal and vaginal
129	Repair of cystocele and rectocele; obliteration of vaginal vault
132	Other OR therapeutic procedures; female organs
142	Partial excision bone
152	Arthroplasty knee
153	Hip replacement; total and partial
154	Arthroplasty other than hip or knee
157	Amputation of lower extremity
158	Spinal fusion
159	Other diagnostic procedures on musculoskeletal system
166	Lumpectomy; quadrantectomy of breast
167	Mastectomy
169	Debridement of wound; infection or burn
170	Excision of skin lesion
172	Skin graft
211	Therapeutic radiology for cancer treatment
224	Cancer chemotherapy

(continued)

Table B3 (continued)
HWR planned procedures

AHRQ CCS Procedures	Name
ICD-9 Codes	Description
30.1, 30.29, 30.3, 30.4, 31.74, 34.6	Laryngectomy, revision of tracheostomy, scarification of pleura (from Proc CCS 42- Other OR Rx procedures on respiratory system and mediastinum)
38.18	Endarterectomy leg vessel (from Proc CCS 60- Embolectomy and endarterectomy of lower limbs)
55.03, 55.04	Percutaneous nephrostomy with and without fragmentation (from Proc CCS 103- Nephrotomy and nephrostomy)
94.26, 94.27	Electroshock therapy (from Proc CCS 218- Psychological and psychiatric evaluation and therapy)

NOTE: From the February 2013 Version of the HWR Planned Readmission Algorithm

Table B4
HWR discharge condition categories that disqualify a readmission from being considered planned

Diagnosis CCS	Description
1	Tuberculosis
2	Septicemia (except in labor)
3	Bacterial infection; unspecified site
4	Mycoses
5	HIV infection
7	Viral infection
8	Other infections; including parasitic
9	Sexually transmitted infections (not HIV or hepatitis)
54	Gout and other crystal arthropathies
55	Fluid and electrolyte disorders
60	Acute posthemorrhagic anemia
61	Sickle cell anemia
63	Diseases of white blood cells
76	Meningitis (except that caused by tuberculosis or sexually transmitted disease)
77	Encephalitis (except that caused by tuberculosis or sexually transmitted disease)
78	Other CNS infection and poliomyelitis
82	Paralysis
83	Epilepsy; convulsions
84	Headache; including migraine
85	Coma; stupor; and brain damage
87	Retinal detachments; defects; vascular occlusion; and retinopathy
89	Blindness and vision defects
90	Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease)
91	Other eye disorders
92	Otitis media and related conditions
93	Conditions associated with dizziness or vertigo
100	Acute myocardial infarction (with the exception of ICD-9 codes 410.x2)
102	Nonspecific chest pain
104	Other and ill-defined heart disease

(continued)

Table B4 (continued)
HWR discharge condition categories that disqualify a readmission from being considered planned

Diagnosis CCS	Description
107	Cardiac arrest and ventricular fibrillation
109	Acute cerebrovascular disease
112	Transient cerebral ischemia
116	Aortic and peripheral arterial embolism or thrombosis
118	Phlebitis; thrombophlebitis and thromboembolism
120	Hemorrhoids
122	Pneumonia (except that caused by TB or sexually transmitted disease)
123	Influenza
124	Acute and chronic tonsillitis
125	Acute bronchitis
126	Other upper respiratory infections
127	Chronic obstructive pulmonary disease and bronchiectasis
128	Asthma
129	Aspiration pneumonitis; food/vomitus
130	Pleurisy; pneumothorax; pulmonary collapse
131	Respiratory failure; insufficiency; arrest (adult)
135	Intestinal infection
137	Diseases of mouth; excluding dental
139	Gastroduodenal ulcer (except hemorrhage)
140	Gastritis and duodenitis
142	Appendicitis and other appendiceal conditions
145	Intestinal obstruction without hernia
146	Diverticulosis and diverticulitis
148	Peritonitis and intestinal abscess
153	Gastrointestinal hemorrhage
154	Noninfectious gastroenteritis
157	Acute and unspecified renal failure
159	Urinary tract infections
165	Inflammatory conditions of male genital organs

(continued)

Table B4 (continued)
HWR discharge condition categories that disqualify a readmission from being considered planned

Diagnosis CCS	Description
168	Inflammatory diseases of female pelvic organs
169	Debridement of wound; infection or burn
172	Ovarian cyst
197	Skin and subcutaneous tissue infections
198	Other inflammatory condition of skin
225	Joint disorders and dislocations; trauma-related
226	Fracture of neck of femur (hip)
227	Spinal cord injury
228	Skull and face fractures
229	Fracture of upper limb
230	Fracture of lower limb
232	Sprains and strains
233	Intracranial injury
234	Crushing injury or internal injury
235	Open wounds of head; neck; and trunk
237	Complication of device; implant or graft
238	Complications of surgical procedures or medical care
239	Superficial injury; contusion
240	Burns
241	Poisoning by psychotropic agents
242	Poisoning by other medications and drugs
243	Poisoning by nonmedicinal substances
244	Other injuries and conditions due to external causes
245	Syncope
246	Fever of unknown origin
247	Lymphadenitis
249	Shock
250	Nausea and vomiting
251	Abdominal pain

(continued)

Table B4 (continued)
HWR discharge condition categories that disqualify a readmission from being considered planned

Diagnosis CCS	Description
252	Malaise and fatigue
253	Allergic reactions
259	Residual codes; unclassified
650	Adjustment disorders
651	Anxiety disorders
652	Attention-deficit, conduct, and disruptive behavior disorders
653	Delirium, dementia, and amnestic and other cognitive disorders
656	Impulse control disorders, NEC
658	Personality disorders
660	Alcohol-related disorders
661	Substance-related disorders
662	Suicide and intentional self-inflicted injury
663	Screening and history of mental health and substance abuse codes
670	Miscellaneous disorders
ICD-9 Codes	**Description**
Acute ICD-9 codes within Dx CCS 97: Peri-; endo-; and myocarditis; cardiomyopathy	
03282	Diphtheritic myocarditis
03640	Meningococcal carditis nos
03641	Meningococcal pericarditis
03642	Meningococcal endocarditis
03643	Meningococcal myocarditis
07420	Coxsackie carditis nos
07421	Coxsackie pericarditis
07422	Coxsackie endocarditis
07423	Coxsackie myocarditis
11281	Candidal endocarditis
11503	Histoplasma capsulatum pericarditis
11504	Histoplasma capsulatum endocarditis

(continued)

Table B4 (continued)
HWR discharge condition categories that disqualify a readmission from being considered planned

Diagnosis CCS	Description
11513	Histoplasma duboisii pericarditis
11514	Histoplasma duboisii endocarditis
11593	Histoplasmosis pericarditis
11594	Histoplasmosis endocarditis
1303	Toxoplasma myocarditis
3910	Acute rheumatic pericarditis
3911	Acute rheumatic endocarditis
3912	Acute rheumatic myocarditis
3918	Acute rheumatic heart disease nec
3919	Acute rheumatic heart disease nos
3920	Rheumatic chorea w heart involvement
3980	Rheumatic myocarditis
39890	Rheumatic heart disease nos
39899	Rheumatic heart disease nec
4200	Acute pericarditis in other disease
42090	Acute pericarditis nos
42091	Acute idiopath pericarditis
42099	Acute pericarditis nec
4210	Acute/subacute bacterial endocarditis
4211	Acute endocarditis in other diseases
4219	Acute/subacute endocarditis nos
4220	Acute myocarditis in other diseases
42290	Acute myocarditis nos
42291	Idiopathic myocarditis
42292	Septic myocarditis
42293	Toxic myocarditis
42299	Acute myocarditis nec
4230	Hemopericardium
4231	Adhesive pericarditis

(continued)

Table B4 (continued)
HWR discharge condition categories that disqualify a readmission from being considered planned

Diagnosis CCS	Description
4232	Constrictive pericarditis
4233	Cardiac tamponade
4290	Myocarditis nos
Acute ICD-9 codes within Dx CCS 105: Conduction disorders	
4260	Atrioventricular block complete
42610	Atrioventricular block nos
42611	Atrioventricular block-1st degree
42612	Atrioventricular block-mobitz ii
42613	Atrioventricular block-2nd degree nec
4262	Left bundle branch hemiblock
4263	Left bundle branch block nec
4264	Right bundle branch block
42650	Bundle branch block nos
42651	Right bundle branch block/left posterior fascicular block
42652	Right bundle branch block/left ant fascicular block
42653	Bilateral bundle branch block nec
42654	Trifascicular block
4266	Other heart block
4267	Anomalous atrioventricular excitation
42681	Lown-ganong-levine syndrome
42682	Long qt syndrome
4269	Conduction disorder nos
Acute ICD-9 codes within Dx CCS 106: Dysrhythmia	
4272	Paroxysmal tachycardia nos
7850	Tachycardia nos
42789	Cardiac dysrhythmias nec
4279	Cardiac dysrhythmia nos
42769	Premature beats nec

(continued)

Table B4 (continued)
HWR discharge condition categories that disqualify a readmission from being considered planned

Diagnosis CCS	Description
Acute ICD-9 codes within Dx CCS 108: Congestive heart failure; nonhypertensive	
39891	Rheumatic heart failure
4280	Congestive heart failure
4281	Left heart failure
42820	Unspecified systolic heart failure
42821	Acute systolic heart failure
42823	Acute on chronic systolic heart failure
42830	Unspecified diastolic heart failure
42831	Acute diastolic heart failure
42833	Acute on chronic diastolic heart failure
42840	Unpec combined syst & dias heart failure
42841	Acute combined systolic & diastolic heart failure
42843	Acute on chronic combined systolic & diastolic heart failure
4289	Heart failure nos

NOTE: From the February 2013 Version of the HWR Planned Readmission Algorithm

Table B5
RTI added AHRQ CCS single level procedure codes and ICD-9 procedure codes to Yale's planned readmission algorithm, March 13, for the post-acute care setting

AHRQ CCS Single Level Procedures Codes	Description	Comment
37	Diagnostic Bronchoscopy and Biopsy of Bronchus	
71	Gastrostomy: temporary and permanent	
82	Endoscopic retrograde cannulation of pancreases (ERCP)	
87	Laparoscopy (GI only)	
89	Exploratory Laparotomy	
160	Other therapeutic procedure on muscles and tendons	
164	Other OR therapeutic procedures on musculoskeletal system	
171	Suture of skin and subcutaneous tissue	
ICD-9 Procedure Codes	**Description**	**Comment**
	Topic: Amputation of Lower Extremity	
83.82	Graft of muscle or fascia	
86.87	Fat graft of skin and subcutaneous tissue	Required, Diagnosis V58.41, encounter for planned postoperative wound closure
	Topic: Amputation of Upper Extremity	
84.00	Upper limb amputation, not otherwise specified	
84.01	Amputation and disarticulation of finger	
84.02	Amputation and disarticulation of thumb	
84.03	Amputation through hand	
84.04	Disarticulation of wrist	
84.05	Amputation through forearm	
84.06	Disarticulation of elbow	
84.07	Amputation through humerus	
84.08	Disarticulation of shoulder	
84.09	Interthoracoscapular amputation	

(continued)

Table B5 (continued)
RTI added AHRQ CCS single level procedure codes and ICD-9 procedure codes to Yale's planned readmission algorithm, March 13, for the post-acute care setting

ICD-9 Procedure Codes	Description	Comment
Topic: Removal of Vascular Obstruction, Non-Coronary		
38.18	Endarterectomy, lower limb vessels	
38.08	Embolectomy, lower limb arteries	
39.50	Angioplasty or atherectomy of other non-coronary vessels	
00.55	Insertion of drug-eluting stent(s) of other peripheral vessel(s)	
00.60	Insertion of drug-eluting stent(s) of superficial femoral artery	
39.90	Insertion of non-drug-eluting peripheral (non-coronary) vessel stent(s)	
	Topic: Colon and Rectal Procedures, Selected	
46.85	Dilation of intestine (includes endosopic approach)	
96.08	Insertion of naso-intestinal tube (includes for decompression)	
96.09	Insertion of rectal tube	
46.50	Closure of intestinal stoma, not otherwise specified	Required, Diagnosis code V55.2, attention to ileostomy, and V55.3, attention to colostomy
46.51	Closure of stoma of small intestine	Required, Diagnosis code V55.2, attention to ileostomy, and V55.3, attention to colostomy
46.52	Closure of stoma of large intestine	Required, Diagnosis code V55.2, attention to ileostomy, and V55.3, attention to colostomy
46.86	Endoscopic insertion of colonic stent(s)	
46.87	Other insertion of colonic stent (s)	
	Topic: Insertion of Feeding Tubes	
44.39	Other gastroenterostomy (GJ-tube)	
46.39	Other enterostomy (J-tube)	

(continued)

Table B5 (continued)
RTI added AHRQ CCS single level procedure codes and ICD-9 procedure codes to Yale's planned readmission algorithm, March 13, for the post-acute care setting

ICD-9 Procedure Codes	Description	Comment
Topic: Routine Device Replacement		
86.06	Insertion of totally implanted infusion pump	
Topic: Routine Removal of Devices		
84.57	Removal of (cement) spacer (includes antibiotic impregnated spacer)	
97.41	Removal of thoracotomy tube or pleural cavity drain (non-incisional)	
02.43	Removal of ventricular shunt	
97.37	Removal of tracheostomy tube (non-incisional)	
01.27	removal of catheter(s) from cranial cavity or tissue	
86.05	Incision with removal of foreign body or device from skin and subcutaneous tissue	
02.95	Removal of skull tongs or halo traction device	
78.60-78.69	Removal of implanted devices from bone(includes internal and external fixation)	
80.00-80.09	Orthopedic implants arthrotomy for removal of prosthesis without replacement	This code became available in CY 2010
	Topic: Pleurosclerosis	
34.6	Scarification of pleura	
34.92	Injection into thoracic cavity	
	Topic: Colon and Rectal Procedures, Selected	
51.14	Other close (endoscopic) biopsy of biliary duct or sphincter of Oddi	
51.64	Endoscopic excision or destruction of lesion of biliary ducts or sphincter of Oddi	
51.84	Endoscopic dilation of ampulla and biliary duct	

(continued)

Table B5 (continued)
RTI added AHRQ CCS single level procedure codes and ICD-9 procedure codes to Yale's planned readmission algorithm, March 13, for the post-acute care setting

ICD-9 Procedure Codes	Description	Comment
51.85	Endoscopic sphincterotomy and papillotomy	
51.86	Endoscopic insertion of nasobiliary drainage tube	
51.87	Endoscopic insertion of stent (tube) into bile duct	
51.88	Endoscopic removal of stone(s)from biliary tract	
	Topic: Fistula	
42.84	Repair of esophageal fistula, not elsewhere classified	
44.63	Closure of other gastric fistula (include gastrocolic, gastrojejunocolic fistula)	
46.72	Closure of fistula of duodenum	
46.74	Closure of fistula of small intestine, except duodenum (includes enterocutaneous)	
46.76	Closure of fistula of large intestine	
47.92	Closure of appendiceal fistula	
48.73	Closure of other rectal fistula	
48.93	Repair of perirectal fistula	
49.11	Anal fistulotomy	
49.12	Anal fistulectomy	
49.73	Closure of anal fistula	
19.9	Other repair of middle ear (includes closure of mastoid fistula	
20.93	Repair of oval and round windows (includes closure of fistula)	
21.82	Closure of nasal fistula	
31.62	Closure of fistula of larynx (includes laryngotracheal)	
31.73	Closure of other fistula of trachea (includes tracheoesophageal)	

(continued)

Table B5 (continued)
RTI added AHRQ CCS single level procedure codes and ICD-9 procedure codes to Yale's planned readmission algorithm, March 13, for the post-acute care setting

ICD-9 Procedure Codes	Description	Comment
33.42	Closure of bronchial fistula (includes bronchocutaneous, bronchoesophageal, bronchovisceral)	
34.73	Closure of other fistula of thorax (includes bronchopleural, bronchopleurocutaneous, bronchopleuromediastinal)	
34.83	Closure of fistula of diaphragm (includes thoracicoabdominal, thoracicogastric, thoracicointestinal)	
34.93	Repair of pleura (includes closure of unspecified pleural fistula)	
61.42	repair of scrotal fistula	
	Topic: Tendon Repair (eye)	
15.7	Repair of injury of extraocular muscle (includes repair of tendon)	
	Topic: Aneurysm	
39.51	Clipping of aneurysm	

NOTE: December, 2012 Yale added several additional AHRQ CCS Single-Level Procedure Codes. Two of these codes 169 (Debridement of wound; infection or burn) and 172 (Skin graft) had been on the prior RTI developed list.

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APPENDIX C
MODELING RESULTS (TABLE C-1)

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Table C1
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
Male age 18-64	4.01	26.17	1.005	0.983	1.028	4.13	25.43	0.989	0.967	1.011	4.27	25.42	0.999	0.978	1.021
Male age 65-69	3.95	27.73	1.010	0.989	1.031	4.00	26.90	0.997	0.976	1.018	4.14	26.81	1.004	0.983	1.025
Male age 70-74	4.04	24.10	1.088	1.064	1.113	4.13	23.81	1.089	1.065	1.113	4.23	23.24	1.079	1.056	1.103
Male age 75-79	5.44	24.27	1.129	1.105	1.152	5.42	23.84	1.130	1.107	1.153	5.43	23.47	1.128	1.105	1.151
Male age 80-84	7.03	23.96	1.138	1.116	1.161	6.97	23.63	1.146	1.123	1.169	6.89	23.14	1.134	1.112	1.157
Male age 85-89	6.55	23.82	1.153	1.130	1.177	6.53	23.32	1.148	1.124	1.171	6.51	22.88	1.142	1.119	1.166
Male age 90-94	3.28	22.44	1.109	1.083	1.137	3.39	22.39	1.132	1.105	1.159	3.54	21.85	1.120	1.094	1.147
Male age GT 95	0.92	21.44	1.070	1.030	1.111	0.94	21.04	1.073	1.033	1.114	0.95	20.32	1.054	1.015	1.095
Female age 18-64	3.99	25.09	1.026	1.003	1.049	4.11	24.60	1.011	0.989	1.034	4.29	24.33	1.012	0.990	1.034
Female age 65-69*	5.17	25.44	—	—	—	5.27	24.86	—	—	—	5.46	24.62	—	—	—
Female age 70-74	6.16	20.64	1.024	1.003	1.045	6.26	20.32	1.029	1.009	1.050	6.33	20.19	1.035	1.014	1.056
Female age 75-79	9.27	20.24	1.016	0.997	1.036	9.05	19.83	1.018	0.999	1.038	8.90	19.70	1.024	1.005	1.044
Female age 80-84	13.32	19.70	1.000	0.981	1.018	12.95	19.60	1.015	0.997	1.034	12.52	19.28	1.018	1.000	1.037
Female age 85-89	14.50	19.26	0.990	0.971	1.008	14.35	18.94	0.992	0.974	1.011	13.94	18.54	0.988	0.970	1.007
Female age 90-94	8.87	18.16	0.949	0.930	0.968	9.00	17.83	0.952	0.933	0.971	9.15	17.52	0.955	0.937	0.975
Female age GT 95	3.50	17.15	0.907	0.885	0.931	3.50	16.76	0.907	0.885	0.931	3.43	16.21	0.897	0.875	0.920
LOS btwn 1 & 3 days*	24.07	16.56	—	—	—	24.92	16.12	—	—	—	25.27	15.79	—	—	—
LOS btwn 4 & 7 days	45.40	20.14	1.122	1.112	1.133	45.35	19.97	1.126	1.116	1.137	45.30	19.84	1.136	1.126	1.147
LOS btwn 8 & 14 days	21.99	26.51	1.346	1.332	1.361	21.52	26.46	1.360	1.345	1.374	21.35	26.08	1.353	1.338	1.367
LOS GT 14 days	8.54	32.17	1.596	1.573	1.619	8.22	31.61	1.583	1.560	1.606	8.09	31.40	1.601	1.577	1.624
Originally disabled: based on denominator file	20.17	24.65	1.030	1.019	1.041	20.79	24.33	1.043	1.032	1.054	21.46	24.09	1.039	1.028	1.049

(continued)

Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
End Stage Renal Disease Indicator	4.40	38.73	1.370	1.346	1.394	4.39	38.13	1.381	1.357	1.405	4.52	38.22	1.400	1.376	1.424
Ophthalmology Surgery	0.01	17.16	0.738	0.541	1.006	0.01	17.98	0.809	0.586	1.117	0.01	18.77	0.904	0.661	1.238
Vascular Surgery	2.93	28.88	1.061	1.039	1.082	2.95	28.50	1.064	1.043	1.086	2.96	28.25	1.063	1.042	1.085
Orthopedics Surgery	17.45	13.59	0.922	0.905	0.939	17.75	13.29	0.923	0.905	0.940	17.72	13.09	0.924	0.907	0.941
General surgery	4.80	25.59	0.993	0.974	1.013	4.80	25.16	0.988	0.969	1.007	4.81	25.01	0.975	0.956	0.994
Cardio Thoracic Surgery	1.63	28.19	0.932	0.903	0.962	1.62	27.26	0.908	0.880	0.938	1.61	26.83	0.913	0.884	0.943
Urologic surgery	0.87	26.37	1.032	0.991	1.075	0.86	26.31	1.011	0.970	1.053	0.85	26.76	1.061	1.019	1.105
Neurosurgery	0.61	24.69	1.143	1.095	1.194	0.64	24.65	1.153	1.105	1.204	0.66	24.33	1.189	1.140	1.240
Plastic Surgery	1.28	21.68	0.945	0.916	0.975	1.35	21.42	0.955	0.927	0.985	1.42	21.24	0.963	0.934	0.992
Otolaryngology Surgery	0.17	22.48	0.903	0.830	0.983	0.17	23.85	1.008	0.927	1.097	0.17	22.60	0.940	0.863	1.024
Obstetrics/Gynecology Surgery	0.26	20.70	0.919	0.845	1.000	0.26	21.16	0.955	0.878	1.039	0.25	21.55	0.992	0.912	1.080
0* hospitalizations	44.78	15.92	—	—	—	45.50	15.63	—	—	—	45.83	15.48	—	—	—
1-3 hospitalizations	45.49	24.02	1.057	1.048	1.067	45.04	23.85	1.064	1.054	1.074	44.78	23.51	1.062	1.052	1.072
4-6 hospitalizations	7.80	35.28	1.264	1.245	1.284	7.59	34.89	1.265	1.246	1.285	7.52	34.63	1.274	1.254	1.294
7-9 hospitalizations	1.48	44.57	1.599	1.557	1.642	1.45	43.96	1.587	1.545	1.631	1.43	43.74	1.604	1.561	1.647
10+ hospitalizations	0.45	54.22	2.183	2.088	2.281	0.43	53.00	2.139	2.046	2.237	0.44	53.34	2.197	2.102	2.297
At least one day in ICU (y/n)	25.75	27.39	1.108	1.099	1.117	26.91	26.94	1.110	1.101	1.120	27.73	26.52	1.106	1.097	1.115
1 Tuberculosis	0.01	23.76	1.339	0.960	1.867	0.01	27.37	1.614	1.163	2.241	0.01	30.06	1.740	1.247	2.428
2 Septicemia (except in labor)	5.65	28.18	1.817	1.759	1.877	6.12	27.66	1.771	1.715	1.829	6.65	27.28	1.796	1.739	1.855
3 Bacterial infection; unspecified site	0.03	28.30	2.221	1.835	2.688	0.02	26.25	1.877	1.519	2.320	0.02	19.92	1.363	1.082	1.717
4 Mycoses	0.16	32.01	2.284	2.111	2.472	0.16	30.44	2.141	1.977	2.319	0.15	31.03	2.225	2.053	2.412
5 HIV infection	0.05	38.39	2.240	1.952	2.571	0.05	35.29	2.070	1.789	2.395	0.04	31.49	1.759	1.508	2.051

(continued)

Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
6 Hepatitis	0.06	40.67	2.720	2.406	3.074	0.06	41.70	2.712	2.413	3.048	0.07	42.73	2.793	2.494	3.128
7 Viral infection	0.12	21.19	1.880	1.699	2.080	0.11	21.36	1.869	1.683	2.075	0.11	20.88	1.887	1.701	2.092
8 Other infections; including parasitic	0.02	20.74	1.540	1.229	1.931	0.02	21.70	1.587	1.250	2.014	0.02	17.88	1.355	1.074	1.710
11 Cancer of head and neck	0.04	25.86	2.091	1.753	2.494	0.04	24.27	1.754	1.466	2.099	0.04	25.61	2.058	1.729	2.449
12 Cancer of esophagus	0.01	34.76	2.533	1.893	3.390	0.01	27.44	1.788	1.318	2.427	0.01	28.45	1.938	1.448	2.593
13 Cancer of stomach	0.04	30.63	2.009	1.716	2.351	0.03	28.48	1.874	1.592	2.205	0.03	29.19	2.022	1.714	2.385
14 Cancer of colon	0.35	21.89	1.586	1.486	1.692	0.34	21.97	1.585	1.484	1.692	0.33	21.66	1.599	1.496	1.708
15 Cancer of rectum and anus	0.10	27.59	2.221	2.010	2.454	0.10	25.75	2.007	1.806	2.229	0.09	26.00	2.091	1.879	2.327
16 Cancer of liver and intrahepatic bile duct	0.01	36.18	3.042	2.165	4.274	0.01	27.22	1.865	1.299	2.677	0.01	27.88	1.852	1.306	2.625
17 Cancer of pancreas	0.03	31.53	2.266	1.921	2.674	0.03	29.34	2.053	1.731	2.435	0.03	32.70	2.478	2.098	2.928
18 Cancer of other GI organs; peritoneum	0.03	26.97	1.945	1.633	2.317	0.03	27.65	1.956	1.647	2.324	0.03	29.05	2.126	1.798	2.512
19 Cancer of bronchus; lung	0.11	22.63	1.747	1.573	1.940	0.11	22.16	1.723	1.548	1.918	0.11	22.10	1.751	1.574	1.948
21 Cancer of bone and connective tissue	0.02	24.22	2.286	1.829	2.857	0.02	22.56	2.141	1.710	2.682	0.02	23.14	2.282	1.829	2.846
23 Other non-epithelial cancer of skin	0.02	14.10	1.226	0.915	1.641	0.02	17.13	1.456	1.098	1.932	0.02	17.28	1.502	1.129	1.998
24 Cancer of breast	0.05	15.18	1.609	1.365	1.897	0.05	14.42	1.541	1.293	1.838	0.04	14.72	1.601	1.332	1.925
25 Cancer of uterus	0.05	19.56	2.002	1.682	2.382	0.05	20.36	2.061	1.723	2.465	0.04	19.94	1.970	1.641	2.365
27 Cancer of ovary	0.03	23.40	2.003	1.630	2.462	0.03	23.08	1.942	1.590	2.370	0.03	24.67	1.982	1.612	2.436
28 Cancer of other female genital organs	0.01	26.75	3.035	2.321	3.969	0.01	21.88	2.416	1.828	3.193	0.01	22.19	2.374	1.778	3.170
29 Cancer of prostate	0.02	24.27	1.865	1.502	2.316	0.02	22.60	1.629	1.294	2.052	0.02	23.43	1.577	1.251	1.988

(continued)

Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
32 Cancer of bladder	0.10	26.98	1.976	1.776	2.198	0.10	29.07	2.205	1.983	2.453	0.10	29.60	2.216	1.991	2.465
33 Cancer of kidney and renal pelvis	0.05	20.03	1.456	1.251	1.695	0.05	22.14	1.638	1.411	1.901	0.05	21.07	1.477	1.272	1.716
34 Cancer of other urinary organs	0.01	21.36	1.554	1.117	2.161	0.01	23.92	1.779	1.283	2.467	0.01	27.54	2.144	1.596	2.881
35 Cancer of brain and nervous system	0.02	29.15	2.425	1.988	2.957	0.02	29.64	2.442	2.009	2.968	0.02	23.95	1.863	1.518	2.286
37 Hodgkin`s disease	0.00	26.00	1.916	1.011	3.632	0.00	36.74	2.968	1.644	5.359	0.00	31.58	2.731	1.350	5.524
38 Non-Hodgkin`s lymphoma	0.03	27.01	2.018	1.707	2.385	0.03	32.24	2.587	2.207	3.032	0.03	30.66	2.443	2.071	2.881
39 Leukemias	0.00	26.47	1.387	0.800	2.404	0.00	33.33	2.172	1.270	3.716	0.00	25.81	1.586	0.888	2.833
40 Multiple myeloma	0.01	34.57	3.079	2.205	4.298	0.01	25.00	1.902	1.340	2.698	0.01	25.90	1.962	1.372	2.805
41 Cancer; other and unspecified primary	0.00	28.79	2.659	1.534	4.607	0.00	21.69	1.660	0.975	2.826	0.00	23.26	1.688	1.015	2.808
42 Secondary malignancies	0.13	27.33	2.040	1.863	2.233	0.13	26.62	1.956	1.786	2.141	0.12	25.17	1.800	1.639	1.978
43 Malignant neoplasm without specification of site	0.00	30.51	2.484	1.409	4.381	0.00	24.10	1.666	1.001	2.775	0.00	26.42	2.079	1.340	3.223
44 Neoplasms of unspecified nature or uncertain behavior	0.02	25.42	2.169	1.773	2.653	0.02	26.08	2.140	1.753	2.612	0.02	22.04	1.865	1.515	2.295
47 Other and unspecified benign neoplasm	0.17	21.54	1.839	1.687	2.005	0.16	23.74	2.049	1.884	2.229	0.16	24.47	2.161	1.985	2.352
48 Thyroid disorders	0.06	22.17	1.927	1.674	2.218	0.06	20.19	1.693	1.467	1.955	0.06	19.45	1.623	1.404	1.875
49 Diabetes mellitus without complication	0.02	18.67	1.708	1.351	2.159	0.02	20.44	1.899	1.506	2.394	0.02	19.36	1.731	1.343	2.230
50 Diabetes mellitus with complications	1.51	23.98	1.665	1.601	1.731	1.50	23.15	1.594	1.533	1.657	1.50	23.05	1.612	1.550	1.677
51 Other endocrine disorders	0.25	21.65	1.781	1.659	1.913	0.26	21.12	1.740	1.621	1.868	0.27	21.55	1.841	1.718	1.974

(continued)

Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
52 Nutritional deficiencies	0.10	26.33	2.230	2.017	2.466	0.09	26.37	2.237	2.016	2.482	0.08	26.23	2.256	2.019	2.521
54 Gout and other crystal arthropathies	0.09	20.92	1.712	1.524	1.924	0.10	20.82	1.708	1.529	1.907	0.10	19.94	1.700	1.524	1.897
55 Fluid and electrolyte disorders	2.21	21.31	1.870	1.804	1.938	2.09	21.27	1.838	1.773	1.907	1.93	20.96	1.852	1.784	1.922
57 Immunity disorders	0.00	30.30	2.242	1.041	4.829	0.00	36.67	3.492	1.625	7.505	0.00	34.38	2.913	1.376	6.164
58 Other nutritional; endocrine; and metabolic disorders	0.34	21.24	1.832	1.720	1.953	0.33	21.41	1.817	1.705	1.937	0.33	21.28	1.793	1.681	1.912
59 Deficiency and other anemia	0.84	26.79	2.072	1.983	2.166	0.82	26.76	2.046	1.958	2.139	0.81	26.91	2.070	1.980	2.164
60 Acute posthemorrhagic anemia	0.13	24.58	1.913	1.747	2.094	0.15	24.21	1.890	1.735	2.058	0.18	24.23	1.882	1.738	2.038
61 Sickle cell anemia	0.01	35.86	2.211	1.637	2.986	0.01	37.50	2.398	1.801	3.194	0.01	37.64	2.428	1.772	3.326
62 Coagulation and hemorrhagic disorders	0.08	29.35	2.250	2.017	2.510	0.07	31.29	2.458	2.197	2.750	0.07	31.71	2.474	2.206	2.775
63 Diseases of white blood cells	0.09	27.28	1.942	1.748	2.157	0.09	27.89	1.998	1.800	2.219	0.09	26.49	1.886	1.693	2.100
64 Other hematologic conditions	0.01	28.93	2.081	1.519	2.851	0.01	31.84	2.427	1.758	3.351	0.01	31.29	2.315	1.650	3.247
76 Meningitis (except that caused by tuberculosis or sexually transmitted disease)	0.03	24.52	1.958	1.634	2.347	0.03	25.52	2.032	1.698	2.430	0.03	25.24	2.095	1.760	2.493
77 Encephalitis (except that caused by tuberculosis or sexually transmitted disease)	0.03	27.38	2.107	1.743	2.547	0.03	26.77	2.064	1.717	2.482	0.03	22.97	1.692	1.400	2.046
78 Other CNS infection and poliomyelitis	0.03	28.78	2.119	1.784	2.516	0.03	30.26	2.307	1.947	2.733	0.03	27.48	2.104	1.773	2.498

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
79 Parkinson`s disease	0.15	13.40	1.346	1.211	1.497	0.13	13.53	1.383	1.237	1.546	0.12	13.03	1.360	1.213	1.526
80 Multiple sclerosis	0.05	14.44	1.475	1.237	1.758	0.05	13.93	1.416	1.190	1.687	0.05	14.54	1.477	1.247	1.751
81 Other hereditary and degenerative nervous system conditions	0.24	18.62	1.723	1.597	1.859	0.24	17.94	1.660	1.537	1.794	0.23	17.21	1.592	1.471	1.723
82 Paralysis	0.02	15.40	1.343	1.034	1.744	0.02	16.87	1.497	1.147	1.953	0.02	18.63	1.781	1.386	2.287
83 Epilepsy; convulsions	0.65	20.22	1.639	1.558	1.724	0.64	20.63	1.672	1.590	1.759	0.65	20.58	1.712	1.628	1.800
84 Headache; including migraine	0.02	18.22	1.552	1.225	1.966	0.02	21.70	1.895	1.532	2.345	0.03	19.86	1.760	1.424	2.175
85 Coma; stupor; and brain damage	0.12	19.29	1.635	1.473	1.815	0.11	19.52	1.646	1.483	1.828	0.12	18.04	1.522	1.372	1.689
89 Blindness and vision defects	0.01	17.50	1.586	1.094	2.300	0.01	15.64	1.328	0.910	1.937	0.01	16.19	1.438	0.991	2.087
90 Inflammation; infection of eye (except that caused by tuberculosis or sexually transmitted disease)	0.02	18.90	1.762	1.409	2.203	0.03	22.97	2.221	1.818	2.713	0.02	22.55	2.245	1.827	2.759
91 Other eye disorders	0.01	16.32	1.466	0.991	2.170	0.01	20.69	1.909	1.378	2.646	0.01	18.27	1.746	1.220	2.500
93 Conditions associated with dizziness or vertigo	0.16	10.86	1.095	0.980	1.224	0.16	12.38	1.271	1.144	1.413	0.15	11.42	1.166	1.043	1.303
94 Other ear and sense organ disorders	0.01	18.23	1.660	1.154	2.389	0.01	20.46	1.894	1.355	2.648	0.01	16.96	1.437	1.010	2.043
95 Other nervous system disorders	1.07	20.18	1.696	1.624	1.771	1.15	20.45	1.709	1.639	1.783	1.19	19.70	1.652	1.584	1.723
96 Heart valve disorders	0.47	28.09	2.138	2.016	2.266	0.48	27.96	2.139	2.018	2.267	0.51	26.40	2.030	1.915	2.151

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
97 Periendo & myocarditis cardiomyopathy (except caused by tuberculosis or sexually transmitted disease)	0.14	31.39	2.099	1.930	2.283	0.13	31.85	2.161	1.984	2.353	0.13	31.95	2.207	2.026	2.405
98 Essential hypertension	0.09	16.98	1.678	1.486	1.894	0.09	16.80	1.664	1.470	1.883	0.09	14.54	1.436	1.260	1.637
99 Hypertension with complications and secondary hypertension	0.68	30.31	1.950	1.862	2.042	0.68	29.11	1.843	1.759	1.930	0.69	28.72	1.859	1.775	1.948
100 Acute myocardial infarction	1.83	28.19	2.169	2.091	2.251	1.77	27.68	2.113	2.037	2.193	1.69	27.79	2.175	2.095	2.258
101 Coronary atherosclerosis and other heart disease	0.87	26.38	1.993	1.901	2.088	0.80	25.06	1.883	1.795	1.976	0.74	24.88	1.915	1.823	2.012
102 Nonspecific chest pain	0.48	22.43	1.722	1.630	1.819	0.46	22.66	1.744	1.650	1.843	0.41	21.48	1.656	1.561	1.756
103 Pulmonary heart disease	0.61	23.84	1.810	1.722	1.903	0.64	23.24	1.762	1.677	1.850	0.63	21.94	1.696	1.613	1.783
104 Other and ill-defined heart disease	0.01	24.57	1.842	1.403	2.418	0.02	20.49	1.569	1.213	2.029	0.02	21.01	1.689	1.312	2.175
105 Conduction disorders	0.21	17.46	1.433	1.320	1.555	0.21	18.91	1.561	1.440	1.693	0.21	18.70	1.579	1.458	1.711
106 Cardiac dysrhythmias	2.06	23.34	1.908	1.840	1.978	2.07	22.96	1.868	1.801	1.936	2.06	23.31	1.955	1.885	2.027
107 Cardiac arrest and ventricular fibrillation	0.02	31.59	1.867	1.496	2.331	0.02	30.74	1.785	1.456	2.188	0.02	29.23	1.708	1.411	2.067
108 Congestive heart failure; nonhypertensive	5.15	29.68	2.103	2.037	2.171	5.00	29.37	2.036	1.972	2.102	4.78	28.51	2.011	1.947	2.077
109 Acute cerebrovascular disease	3.00	20.86	1.952	1.885	2.020	3.02	20.48	1.922	1.856	1.989	3.03	19.95	1.891	1.827	1.959
110 Occlusion or stenosis of precerebral arteries	0.14	18.69	1.444	1.310	1.592	0.13	17.78	1.362	1.231	1.508	0.13	17.86	1.431	1.292	1.584

(continued)

Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
111 Other and ill-defined cerebrovascular disease	0.08	16.49	1.493	1.309	1.703	0.07	16.55	1.489	1.296	1.712	0.07	17.07	1.561	1.356	1.799
112 Transient cerebral ischemia	0.55	16.98	1.633	1.545	1.727	0.54	15.58	1.462	1.380	1.549	0.53	15.50	1.506	1.420	1.596
113 Late effects of cerebrovascular disease	0.15	19.36	1.642	1.496	1.802	0.14	18.99	1.588	1.442	1.748	0.14	17.99	1.523	1.380	1.680
114 Peripheral and visceral atherosclerosis	0.62	25.91	1.934	1.840	2.032	0.60	25.48	1.869	1.778	1.965	0.60	25.91	1.967	1.871	2.068
115 Aortic; peripheral; and visceral artery aneurysms	0.19	25.69	1.800	1.666	1.945	0.19	25.05	1.713	1.584	1.852	0.20	25.34	1.831	1.695	1.978
116 Aortic and peripheral arterial embolism or thrombosis	0.15	27.27	2.095	1.923	2.283	0.14	28.07	2.174	1.994	2.370	0.14	27.90	2.231	2.044	2.435
117 Other circulatory disease	0.61	20.94	1.614	1.534	1.699	0.59	21.01	1.625	1.543	1.711	0.57	20.61	1.631	1.547	1.719
118 Phlebitis; thrombophlebitis and thromboembolism	0.74	21.26	1.734	1.652	1.819	0.73	20.44	1.657	1.579	1.740	0.71	20.42	1.674	1.593	1.758
119 Varicose veins of lower extremity	0.02	16.25	1.405	1.059	1.866	0.01	17.93	1.588	1.185	2.127	0.01	16.26	1.449	1.054	1.991
120 Hemorrhoids	0.08	24.11	1.854	1.652	2.081	0.08	25.85	2.036	1.819	2.278	0.08	25.01	2.000	1.790	2.234
121 Other diseases of veins and lymphatics	0.13	19.39	1.569	1.420	1.733	0.12	19.05	1.495	1.349	1.657	0.12	19.39	1.574	1.419	1.746
122 Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	5.30	23.17	1.802	1.745	1.861	5.23	23.00	1.769	1.713	1.826	5.25	22.60	1.777	1.720	1.835
123 Influenza	0.05	17.01	1.346	1.150	1.577	0.04	18.42	1.418	1.182	1.700	0.10	15.09	1.276	1.132	1.438
125 Acute bronchitis	0.20	17.75	1.648	1.517	1.790	0.19	15.64	1.427	1.306	1.558	0.20	15.28	1.432	1.312	1.562

(continued)

Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
126 Other upper respiratory infections	0.05	19.84	1.916	1.633	2.248	0.05	20.22	1.902	1.623	2.229	0.05	18.10	1.683	1.433	1.976
127 Chronic obstructive pulmonary disease and bronchiectasis	2.57	27.71	2.173	2.099	2.250	2.45	27.33	2.107	2.035	2.182	2.49	26.83	2.119	2.046	2.194
128 Asthma	0.40	25.26	2.037	1.923	2.157	0.37	24.54	1.926	1.815	2.044	0.37	24.93	2.055	1.937	2.179
129 Aspiration pneumonitis; food/vomitus	1.93	26.48	1.959	1.889	2.032	1.87	26.08	1.917	1.848	1.989	1.78	25.16	1.876	1.807	1.948
130 Pleurisy; pneumothorax; pulmonary collapse	0.35	29.69	2.057	1.941	2.180	0.34	27.54	1.822	1.716	1.934	0.33	27.81	1.913	1.801	2.031
131 Respiratory failure; insufficiency; arrest (adult)	1.52	32.57	2.069	1.993	2.149	1.48	32.41	2.030	1.954	2.108	1.52	31.80	2.043	1.967	2.122
132 Lung disease due to external agents	0.02	29.74	2.316	1.847	2.904	0.02	27.75	1.971	1.546	2.512	0.02	26.20	2.006	1.594	2.524
133 Other lower respiratory disease	0.26	25.94	2.006	1.877	2.145	0.25	25.51	1.942	1.814	2.079	0.24	26.32	2.044	1.909	2.188
134 Other upper respiratory disease	0.08	25.70	1.847	1.647	2.071	0.08	24.39	1.705	1.518	1.914	0.08	25.03	1.782	1.587	2.001
135 Intestinal infection	1.09	30.00	2.196	2.109	2.287	1.06	29.71	2.168	2.081	2.258	1.10	28.28	2.091	2.008	2.178
136 Disorders of teeth and jaw	0.02	18.81	1.700	1.285	2.250	0.02	13.81	1.161	0.867	1.555	0.02	18.23	1.677	1.273	2.211
137 Diseases of mouth; excluding dental	0.06	21.51	1.669	1.458	1.911	0.06	22.21	1.743	1.524	1.994	0.06	19.89	1.549	1.347	1.782
138 Esophageal disorders	0.29	22.02	1.707	1.596	1.826	0.29	21.47	1.633	1.527	1.746	0.28	22.61	1.796	1.679	1.921
139 Gastroduodenal ulcer (except hemorrhage)	0.10	22.75	1.773	1.596	1.971	0.11	23.45	1.858	1.678	2.057	0.10	22.55	1.779	1.603	1.975
140 Gastritis and duodenitis	0.24	22.98	1.760	1.638	1.890	0.23	22.75	1.746	1.624	1.878	0.22	22.77	1.766	1.640	1.902

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
141 Other disorders of stomach and duodenum	0.16	28.34	2.023	1.865	2.194	0.16	26.51	1.801	1.659	1.955	0.17	27.64	1.944	1.795	2.105
142 Appendicitis and other appendiceal conditions	0.06	21.94	1.859	1.627	2.123	0.07	19.23	1.569	1.371	1.795	0.06	20.74	1.805	1.578	2.065
143 Abdominal hernia	0.38	20.10	1.580	1.483	1.684	0.39	20.53	1.624	1.526	1.728	0.42	20.66	1.691	1.591	1.797
144 Regional enteritis and ulcerative colitis	0.08	30.14	2.395	2.149	2.668	0.08	30.10	2.440	2.185	2.725	0.07	29.34	2.409	2.150	2.699
145 Intestinal obstruction without hernia	1.13	23.26	1.765	1.693	1.841	1.10	23.17	1.765	1.691	1.841	1.04	23.61	1.841	1.763	1.921
146 Diverticulosis and diverticulitis	0.68	22.58	1.805	1.719	1.896	0.67	22.93	1.844	1.756	1.936	0.65	23.04	1.893	1.802	1.989
147 Anal and rectal conditions	0.13	23.81	1.971	1.794	2.167	0.13	23.38	1.915	1.743	2.104	0.13	21.53	1.825	1.657	2.011
148 Peritonitis and intestinal abscess	0.06	34.60	2.368	2.089	2.684	0.05	32.41	2.083	1.832	2.368	0.05	31.69	2.070	1.820	2.354
149 Biliary tract disease	0.72	20.69	1.633	1.553	1.717	0.70	20.26	1.603	1.523	1.686	0.68	19.90	1.608	1.527	1.693
151 Other liver diseases	0.28	39.26	2.562	2.404	2.729	0.29	39.13	2.537	2.384	2.701	0.30	38.35	2.496	2.347	2.655
152 Pancreatic disorders (not diabetes)	0.30	22.07	1.635	1.530	1.747	0.30	22.37	1.673	1.567	1.786	0.28	21.98	1.671	1.561	1.789
153 Gastrointestinal hemorrhage	1.49	23.99	1.808	1.740	1.880	1.46	24.05	1.800	1.731	1.871	1.46	24.08	1.819	1.749	1.891
154 Noninfectious gastroenteritis	0.23	21.58	1.852	1.720	1.993	0.23	20.12	1.684	1.563	1.815	0.23	20.59	1.761	1.633	1.899
155 Other gastrointestinal disorders	0.59	26.24	2.019	1.922	2.122	0.61	25.34	1.943	1.850	2.041	0.60	24.97	1.937	1.843	2.035
156 Nephritis; nephrosis; renal sclerosis	0.01	27.89	1.864	1.289	2.695	0.01	35.29	2.610	1.920	3.548	0.01	32.42	2.263	1.695	3.020

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
157 Acute and unspecified renal failure	2.58	27.09	2.017	1.948	2.087	2.68	26.37	1.956	1.890	2.024	3.19	25.45	1.971	1.906	2.039
158 Chronic renal failure	0.05	30.48	1.690	1.480	1.931	0.05	30.51	1.651	1.445	1.886	0.05	35.08	2.036	1.790	2.316
159 Urinary tract infections	4.62	20.05	1.778	1.721	1.837	4.68	19.44	1.722	1.667	1.779	4.58	19.18	1.738	1.682	1.796
160 Calculus of urinary tract	0.10	22.34	1.769	1.586	1.972	0.11	22.88	1.845	1.661	2.049	0.10	22.97	1.831	1.648	2.034
161 Other diseases of kidney and ureters	0.08	26.06	2.140	1.907	2.402	0.07	24.06	1.886	1.673	2.125	0.08	22.43	1.760	1.562	1.984
162 Other diseases of bladder and urethra	0.08	24.46	1.905	1.692	2.146	0.08	22.85	1.718	1.522	1.939	0.07	24.15	1.876	1.662	2.116
163 Genitourinary symptoms and ill-defined conditions	0.14	23.78	1.870	1.708	2.047	0.14	24.44	1.895	1.734	2.072	0.13	24.76	1.953	1.785	2.136
164 Hyperplasia of prostate	0.11	21.30	1.628	1.465	1.808	0.11	20.83	1.597	1.437	1.774	0.10	21.11	1.615	1.449	1.801
165 Inflammatory conditions of male genital organs	0.04	18.36	1.364	1.153	1.613	0.05	22.87	1.704	1.465	1.983	0.05	20.19	1.536	1.316	1.793
166 Other male genital disorders	0.02	25.13	1.811	1.429	2.295	0.02	24.56	1.710	1.325	2.206	0.02	18.38	1.274	0.975	1.666
167 Nonmalignant breast conditions	0.01	17.38	1.334	0.960	1.854	0.01	22.22	1.704	1.274	2.281	0.01	22.15	1.858	1.395	2.476
168 Inflammatory diseases of female pelvic organs	0.02	17.46	1.415	1.092	1.834	0.02	22.11	1.907	1.498	2.429	0.02	24.94	2.138	1.682	2.718
170 Prolapse of female genital organs	0.02	14.16	1.702	1.288	2.250	0.02	13.16	1.485	1.107	1.990	0.02	12.56	1.386	1.022	1.879
173 Menopausal disorders	0.01	18.27	1.544	1.145	2.081	0.01	18.21	1.465	1.075	1.997	0.01	22.26	1.805	1.352	2.411
175 Other female genital disorders	0.03	22.65	1.882	1.576	2.248	0.04	22.37	1.817	1.530	2.158	0.04	22.73	1.871	1.575	2.222

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
197 Skin and subcutaneous tissue infections	1.73	19.20	1.627	1.565	1.691	1.77	18.80	1.579	1.519	1.641	1.77	18.86	1.629	1.567	1.693
198 Other inflammatory condition of skin	0.03	23.41	1.953	1.639	2.328	0.03	26.43	2.384	1.994	2.849	0.03	27.85	2.592	2.182	3.079
199 Chronic ulcer of skin	0.52	21.77	1.610	1.524	1.701	0.48	20.94	1.526	1.442	1.615	0.45	20.14	1.485	1.400	1.575
200 Other skin disorders	0.01	20.14	1.488	1.110	1.994	0.01	22.64	1.856	1.402	2.456	0.02	20.41	1.576	1.202	2.067
201 Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease)	0.42	21.47	1.610	1.520	1.705	0.40	20.14	1.495	1.409	1.586	0.39	20.03	1.560	1.470	1.656
202 Rheumatoid arthritis and related disease	0.07	13.25	1.317	1.134	1.528	0.07	12.07	1.225	1.048	1.432	0.07	13.31	1.334	1.141	1.559
203 Osteoarthritis*	5.61	7.40	—	—	—	5.84	7.28	—	—	—	5.69	7.11	—	—	—
204 Other non-traumatic joint disorders	0.27	14.14	1.512	1.397	1.636	0.26	13.74	1.483	1.368	1.607	0.25	13.10	1.428	1.314	1.552
205 Spondylosis; intervertebral disc disorders; other back problems	1.42	16.09	1.741	1.675	1.810	1.43	15.51	1.656	1.593	1.722	1.42	15.19	1.646	1.583	1.712
207 Pathological fracture	0.85	17.93	1.809	1.729	1.892	0.79	17.41	1.736	1.657	1.818	0.76	16.91	1.709	1.629	1.792
209 Other acquired deformities	0.17	14.21	1.497	1.362	1.646	0.18	14.36	1.517	1.384	1.664	0.19	14.03	1.512	1.380	1.656
210 Systemic lupus erythematosus and connective tissue disorders	0.02	31.39	2.420	1.981	2.956	0.02	28.90	2.155	1.739	2.672	0.02	29.16	2.184	1.755	2.718
211 Other connective tissue disease	0.69	15.79	1.490	1.414	1.570	0.71	15.80	1.487	1.412	1.566	0.73	14.84	1.425	1.353	1.502

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
212 Other bone disease and musculoskeletal deformities	0.29	14.60	1.526	1.416	1.643	0.29	13.67	1.418	1.315	1.530	0.29	13.77	1.471	1.364	1.587
213 Cardiac and circulatory congenital anomalies	0.01	28.05	2.191	1.647	2.914	0.01	24.79	2.024	1.498	2.733	0.01	20.35	1.540	1.147	2.067
214 Digestive congenital anomalies	0.00	24.49	1.995	1.248	3.190	0.00	25.74	2.141	1.361	3.368	0.00	26.53	2.224	1.409	3.512
215 Genitourinary congenital anomalies	0.00	24.14	1.982	1.076	3.650	0.00	29.23	2.121	1.222	3.684	0.00	25.86	1.754	0.958	3.212
217 Other congenital anomalies	0.04	14.66	1.848	1.516	2.251	0.04	14.93	1.835	1.518	2.219	0.04	13.10	1.652	1.339	2.038
225 Joint disorders and dislocations; trauma-related	0.09	14.69	1.671	1.474	1.895	0.10	14.32	1.709	1.513	1.930	0.10	14.93	1.740	1.545	1.960
226 Fracture of neck of femur (hip)	5.93	15.76	1.750	1.703	1.798	5.93	15.64	1.733	1.687	1.780	5.92	15.18	1.708	1.662	1.756
227 Spinal cord injury	0.03	24.27	2.262	1.880	2.722	0.03	23.17	2.210	1.850	2.639	0.03	24.83	2.391	2.014	2.840
228 Skull and face fractures	0.10	13.77	1.359	1.195	1.545	0.10	15.30	1.516	1.342	1.712	0.09	14.81	1.508	1.329	1.710
229 Fracture of upper limb	1.00	15.19	1.722	1.648	1.799	0.99	15.04	1.703	1.630	1.780	0.99	14.74	1.700	1.627	1.778
230 Fracture of lower limb	1.72	15.59	1.722	1.661	1.785	1.76	15.65	1.726	1.666	1.789	1.77	15.54	1.738	1.677	1.802
231 Other fractures	2.21	14.57	1.527	1.472	1.585	2.22	14.46	1.519	1.464	1.576	2.25	14.30	1.537	1.481	1.595
232 Sprains and strains	0.17	13.67	1.451	1.316	1.600	0.17	12.84	1.331	1.203	1.473	0.15	12.94	1.379	1.241	1.532
233 Intracranial injury	0.72	22.99	2.112	2.013	2.216	0.76	22.08	2.013	1.920	2.111	0.79	21.37	1.993	1.901	2.090
234 Crushing injury or internal injury	0.16	21.81	1.780	1.634	1.939	0.17	23.02	1.908	1.758	2.071	0.17	21.83	1.844	1.695	2.006
235 Open wounds of head; neck; and trunk	0.07	15.78	1.525	1.318	1.765	0.07	15.33	1.435	1.238	1.664	0.07	14.46	1.401	1.205	1.629

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
236 Open wounds of extremities	0.05	19.45	1.886	1.625	2.188	0.06	18.32	1.706	1.467	1.983	0.06	18.57	1.776	1.533	2.057
237 Complication of device; implant or graft	2.89	25.10	1.891	1.832	1.952	2.94	24.55	1.850	1.792	1.909	3.02	24.07	1.851	1.793	1.911
238 Complications of surgical procedures or medical care	1.44	27.27	1.946	1.873	2.022	1.44	26.84	1.893	1.822	1.966	1.44	26.79	1.910	1.838	1.984
239 Superficial injury; contusion	0.35	17.13	1.698	1.589	1.815	0.33	16.90	1.631	1.523	1.745	0.32	16.11	1.578	1.471	1.693
240 Burns	0.03	22.31	1.913	1.602	2.283	0.03	22.19	1.802	1.503	2.161	0.03	22.97	1.990	1.664	2.381
241 Poisoning by psychotropic agents	0.03	18.32	1.369	1.129	1.658	0.04	18.75	1.406	1.171	1.689	0.04	19.21	1.497	1.260	1.778
242 Poisoning by other medications and drugs	0.14	19.81	1.442	1.309	1.587	0.14	19.37	1.395	1.267	1.535	0.14	18.95	1.382	1.254	1.522
243 Poisoning by nonmedicinal substances	0.01	22.54	1.827	1.314	2.538	0.01	23.26	1.915	1.387	2.645	0.01	19.39	1.423	0.993	2.041
244 Other injuries and conditions due to external causes	0.27	20.01	1.724	1.607	1.850	0.28	19.51	1.647	1.534	1.767	0.27	18.46	1.554	1.445	1.671
245 Syncope	0.80	16.09	1.494	1.422	1.571	0.79	15.79	1.477	1.405	1.553	0.72	15.37	1.451	1.377	1.529
246 Fever of unknown origin	0.13	23.37	1.910	1.739	2.097	0.13	23.37	1.904	1.734	2.091	0.12	22.40	1.820	1.653	2.003
248 Gangrene	0.38	27.49	1.792	1.690	1.902	0.37	27.28	1.764	1.662	1.873	0.36	27.82	1.863	1.754	1.978
249 Shock	0.01	32.24	2.101	1.482	2.977	0.01	30.00	1.876	1.327	2.651	0.01	26.24	1.593	1.088	2.333
250 Nausea and vomiting	0.08	22.23	1.828	1.630	2.051	0.09	21.85	1.790	1.604	1.998	0.09	23.49	1.990	1.780	2.225
251 Abdominal pain	0.16	22.39	1.856	1.702	2.023	0.15	22.54	1.825	1.673	1.992	0.15	22.98	1.909	1.747	2.086
252 Malaise and fatigue	0.28	16.49	1.581	1.469	1.702	0.28	16.64	1.603	1.489	1.725	0.28	15.70	1.515	1.405	1.633
253 Allergic reactions	0.03	24.97	2.084	1.754	2.476	0.03	26.95	2.263	1.905	2.687	0.03	23.97	1.962	1.640	2.346

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
257 Other aftercare	0.02	22.64	1.855	1.460	2.359	0.01	23.08	1.731	1.327	2.259	0.02	21.32	1.685	1.320	2.150
259 Residual codes; unclassified	0.58	20.08	1.723	1.635	1.816	0.60	20.40	1.744	1.656	1.837	0.57	19.85	1.719	1.630	1.812
651 Anxiety disorders	0.03	17.78	1.560	1.266	1.923	0.03	16.34	1.448	1.172	1.788	0.03	13.98	1.165	0.921	1.474
653 Delirium	2.22	12.67	1.202	1.154	1.251	2.16	12.67	1.204	1.157	1.254	2.08	12.42	1.196	1.148	1.247
654 Developmental disorders	0.02	18.13	1.791	1.354	2.368	0.01	17.70	1.734	1.297	2.318	0.01	16.17	1.537	1.082	2.185
657 Mood disorders	0.68	13.09	1.069	1.010	1.131	0.69	12.68	1.039	0.981	1.099	0.68	12.86	1.061	1.002	1.123
659 Schizophrenia and other psychotic disorders	0.70	13.41	1.147	1.084	1.214	0.69	13.44	1.155	1.092	1.221	0.72	13.62	1.166	1.103	1.233
660 Alcohol-related disorders	0.13	15.16	1.173	1.054	1.306	0.15	14.95	1.201	1.085	1.329	0.15	14.84	1.210	1.095	1.338
661 Substance-related disorders	0.19	19.04	1.525	1.403	1.657	0.19	18.66	1.454	1.337	1.582	0.18	18.76	1.449	1.330	1.578
663 Screening and history of mental health and substance abuse codes	0.07	32.43	2.262	2.017	2.538	0.07	34.09	2.416	2.150	2.716	0.07	31.44	2.196	1.956	2.465
670 Miscellaneous disorders	0.02	17.32	1.524	1.163	1.997	0.02	19.01	1.643	1.256	2.149	0.02	17.29	1.530	1.152	2.030
Non-significant CCS with Protective Effect	0.04	11.36	0.997	0.805	1.236	0.04	10.22	0.877	0.700	1.098	0.04	11.73	1.030	0.837	1.269
Nonsignificant CCS with effect that increases risk	0.12	17.23	1.611	1.445	1.795	0.11	15.73	1.419	1.266	1.589	0.11	14.15	1.306	1.160	1.471
HCC1 HIV/AIDS	0.21	34.43	1.209	1.123	1.302	0.23	32.50	1.144	1.065	1.228	0.23	31.48	1.157	1.078	1.241
HCC2 Septicemia, Sepsis, Systemic Inflammatory Response Syndrome/Shock	13.47	30.71	1.038	1.015	1.063	13.97	30.18	1.052	1.028	1.077	14.79	29.55	1.042	1.018	1.067
HCC6 Opportunistic Infections	0.96	35.30	1.134	1.094	1.176	0.97	34.59	1.145	1.104	1.188	0.97	34.84	1.175	1.133	1.219

(continued)

Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
HCC8 Metastatic Cancer and Acute Leukemia	2.38	28.59	1.207	1.172	1.242	2.35	28.82	1.260	1.224	1.297	2.32	28.84	1.290	1.252	1.329
HCC9 Lung and Other Severe Cancers	1.50	30.56	1.211	1.173	1.251	1.53	30.12	1.222	1.184	1.262	1.56	29.76	1.223	1.185	1.263
HCC10 Lymphoma and Other Cancers	1.45	26.69	1.160	1.122	1.198	1.46	26.01	1.151	1.113	1.189	1.48	26.04	1.176	1.138	1.216
HCC11 Colorectal, Bladder, and Other Cancers	1.11	27.49	1.047	1.010	1.085	1.11	27.37	1.070	1.032	1.110	1.10	27.20	1.080	1.041	1.120
HCC12 Breast, Prostate, and Other Cancers and Tumors	1.58	23.46	1.023	0.990	1.057	1.53	22.83	1.012	0.979	1.047	1.56	22.86	1.049	1.014	1.085
HCC17 Diabetes with Acute Complications	0.61	32.95	1.123	1.075	1.172	0.63	32.66	1.153	1.105	1.203	0.70	32.60	1.155	1.108	1.204
HCC18 Diabetes with Chronic Complications	9.52	29.67	1.100	1.075	1.126	9.64	29.06	1.096	1.071	1.123	10.02	28.81	1.112	1.085	1.139
HCC19 Diabetes without complication	22.31	23.19	1.052	1.029	1.075	22.25	22.71	1.057	1.034	1.081	22.85	22.46	1.076	1.052	1.100
HCC21 Protein-Calorie Malnutrition	12.55	29.66	1.110	1.085	1.135	13.19	29.23	1.124	1.098	1.150	13.70	28.85	1.124	1.098	1.150
HCC23 Other Significant Endocrine and Metabolic Disorders	4.50	31.05	1.071	1.044	1.098	4.69	30.74	1.086	1.059	1.114	4.97	30.69	1.087	1.059	1.115
HCC24 Disorders of Fluid/ Electrolyte/Acid-Base Balance	47.44	25.53	1.061	1.039	1.084	48.23	25.13	1.072	1.049	1.096	50.09	24.80	1.080	1.056	1.105
HCC27 End-Stage Liver Disease	1.00	38.43	1.414	1.361	1.468	1.06	38.23	1.440	1.387	1.494	1.15	37.77	1.453	1.401	1.506
HCC28 Cirrhosis of Liver	0.62	29.26	1.168	1.118	1.221	0.66	28.64	1.169	1.119	1.220	0.72	28.02	1.155	1.107	1.204
HCC29 Chronic Hepatitis	0.33	29.51	1.043	0.985	1.105	0.35	28.51	1.043	0.985	1.103	0.39	28.52	1.054	0.999	1.112

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
HCC31 Other Hepatitis and Liver Disease	0.92	26.62	1.039	1.000	1.080	0.95	25.88	1.039	1.000	1.080	1.04	25.84	1.068	1.029	1.109
HCC32 Gallbladder and Biliary Tract Disorders	2.19	26.84	0.964	0.943	0.985	2.15	26.25	0.948	0.927	0.969	2.15	26.37	0.968	0.947	0.990
HCC33 Intestinal Obstruction/Perforation	6.57	28.50	1.049	1.024	1.075	6.36	28.01	1.047	1.022	1.073	6.06	28.10	1.063	1.037	1.090
HCC36 Peptic Ulcer, Hemorrhage, Other Specified Gastrointestinal Disorders	14.55	29.91	1.086	1.062	1.111	14.01	29.54	1.092	1.068	1.117	14.15	29.34	1.100	1.075	1.126
HCC40 Rheumatoid Arthritis and Inflammatory Connective Tissue Disease	4.26	23.86	1.111	1.083	1.140	4.28	23.44	1.118	1.089	1.148	4.52	23.25	1.135	1.106	1.166
HCC46 Severe Hematological Disorders	2.52	33.26	1.233	1.199	1.269	2.63	32.62	1.225	1.191	1.260	2.51	32.38	1.236	1.201	1.272
HCC48 Coagulation Defects and Other Specified Hematological Disorders	6.15	27.76	1.073	1.047	1.099	6.85	27.18	1.080	1.054	1.107	7.37	26.83	1.087	1.061	1.115
HCC49 Iron Deficiency and Other/Unspecified Anemias and Blood Disease	35.95	23.10	1.033	1.011	1.056	35.74	22.61	1.041	1.018	1.064	37.29	22.40	1.046	1.023	1.069
HCC50 Delirium and Encephalopathy	11.38	27.50	1.055	1.031	1.079	12.91	27.00	1.063	1.039	1.088	14.57	26.56	1.064	1.040	1.089
HCC51 Dementia with complications	4.56	20.54	0.969	0.952	0.986	4.23	20.03	0.954	0.937	0.971	4.26	19.73	0.964	0.947	0.982
HCC52 Dementia Without Complication	23.53	20.04	0.937	0.929	0.945	23.62	19.67	0.929	0.921	0.937	24.28	19.51	0.933	0.925	0.941
HCC61 Depression	11.75	21.09	0.979	0.968	0.989	11.35	20.58	0.976	0.966	0.987	12.25	20.23	0.968	0.958	0.979

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
HCC63 Other Psychiatric Disorders	3.70	21.81	1.026	0.999	1.054	3.74	21.13	1.023	0.995	1.051	4.14	20.81	1.027	1.000	1.056
HCC70 Quadriplegia	0.45	28.95	1.095	1.042	1.152	0.50	27.88	1.074	1.023	1.128	0.55	28.32	1.116	1.065	1.170
HCC82 Respirator Dependence/ Tracheostomy Status	0.66	40.25	1.348	1.293	1.405	0.64	40.35	1.410	1.353	1.471	0.69	39.96	1.405	1.348	1.463
HCC84 Cardio-Respiratory Failure and Shock	13.53	32.79	1.140	1.115	1.166	14.59	32.21	1.156	1.130	1.182	15.79	31.37	1.144	1.118	1.171
HCC85 Congestive Heart Failure	35.57	28.02	1.137	1.113	1.162	35.70	27.77	1.161	1.136	1.186	36.24	27.28	1.154	1.128	1.180
HCC86 Acute Myocardial Infarction	5.78	31.44	1.110	1.083	1.137	5.76	31.11	1.123	1.096	1.151	5.78	30.88	1.136	1.108	1.165
HCC87 Unstable Angina and Other Acute Ischemic Heart Disease	1.81	29.60	1.126	1.092	1.162	1.70	28.81	1.107	1.073	1.143	1.76	27.67	1.071	1.037	1.106
HCC88 Angina Pectoris	1.13	24.96	1.043	1.006	1.082	0.97	25.53	1.103	1.062	1.146	0.87	25.19	1.096	1.053	1.140
HCC89 Coronary Atherosclerosis/Other Chronic Ischemic Heart Diseases	26.43	24.37	1.049	1.027	1.072	25.79	24.04	1.061	1.038	1.084	26.41	23.54	1.054	1.031	1.078
HCC90 Heart Infection/ Inflammation, Except Rheumatic	1.24	33.36	1.082	1.046	1.119	1.23	32.48	1.070	1.034	1.107	1.24	32.77	1.102	1.065	1.141
HCC91 Valvular and Rheumatic Heart Disease	9.76	25.86	1.042	1.018	1.066	9.32	25.48	1.055	1.031	1.080	9.66	24.91	1.052	1.027	1.077
HCC96 Specified Heart Arrhythmias	28.75	26.22	1.099	1.076	1.123	29.07	25.77	1.098	1.075	1.123	30.27	25.34	1.106	1.081	1.131

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
HCC102 Cerebrovascular Atherosclerosis, Aneurysm, and Other Disease	2.16	20.52	0.979	0.956	1.002	2.09	20.42	0.987	0.963	1.011	2.14	20.41	0.987	0.964	1.011
HCC105 Late Effects of Cerebrovascular Disease, Except Paralysis	2.91	22.34	0.985	0.966	1.004	2.87	21.87	0.978	0.958	0.998	3.06	21.64	0.986	0.967	1.005
HCC106 Atherosclerosis of the Extremities with Ulceration or Gangrene	2.39	30.52	1.004	0.975	1.034	2.35	30.03	1.023	0.993	1.054	2.34	29.96	1.031	1.000	1.063
HCC107 Vascular Disease with Complications	3.01	29.28	1.054	1.026	1.083	3.09	28.60	1.056	1.028	1.085	3.11	28.29	1.060	1.031	1.090
HCC108 Vascular Disease	11.06	26.55	1.041	1.018	1.065	11.12	26.35	1.058	1.034	1.082	11.58	25.90	1.053	1.028	1.078
HCC111 Chronic Obstructive Pulmonary Disease	25.66	27.24	1.116	1.092	1.140	25.46	27.01	1.142	1.117	1.167	26.00	26.55	1.142	1.116	1.168
HCC112 Fibrosis of Lung and Other Chronic Lung Disorders	1.30	24.31	1.066	1.030	1.104	1.28	23.52	1.059	1.023	1.097	1.29	23.29	1.077	1.040	1.116
HCC114 Aspiration and Specified Bacterial Pneumonias	6.95	32.58	1.152	1.125	1.180	7.04	31.95	1.138	1.111	1.166	7.22	31.42	1.135	1.107	1.163
HCC116 Viral and Unspecified Pneumonia, Pleurisy	16.65	28.65	1.080	1.056	1.104	16.47	28.40	1.085	1.061	1.109	16.64	27.84	1.080	1.056	1.105
HCC117 Pleural Effusion/Pneumothorax	7.23	31.35	1.077	1.052	1.103	6.97	31.21	1.103	1.077	1.130	6.94	30.82	1.101	1.074	1.128
HCC132 Kidney Transplant Status	0.35	39.50	1.452	1.376	1.531	0.37	38.61	1.473	1.398	1.553	0.40	38.28	1.490	1.416	1.568

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
HCC138 Chronic Kidney Disease, Moderate Stage 3)	1.75	21.57	1.087	1.053	1.123	2.26	20.93	1.107	1.074	1.142	2.85	20.25	1.105	1.073	1.138
HCC139 Chronic Kidney Disease, Mild or Unspecified (Stages 1-2 or Unspecified)	6.01	22.59	1.116	1.089	1.144	5.54	21.63	1.121	1.093	1.150	5.44	21.07	1.127	1.099	1.157
HCC141 Nephritis	0.16	22.85	1.088	1.001	1.181	0.14	22.77	1.131	1.034	1.236	0.13	22.16	1.111	1.013	1.219
HCC142 Urinary Obstruction and Retention	7.31	25.54	1.033	1.009	1.058	7.63	25.13	1.049	1.024	1.075	8.32	24.64	1.049	1.024	1.075
HCC144 Urinary Tract Infection	34.83	25.15	1.028	1.006	1.050	34.48	24.79	1.041	1.019	1.064	34.57	24.40	1.039	1.016	1.063
HCC145 Other Urinary Tract Disorders	8.27	26.00	1.036	1.012	1.060	7.59	25.78	1.064	1.039	1.090	7.69	25.25	1.055	1.030	1.081
HCC157 Pressure Ulcer of Skin with Necrosis Through to Muscle, Tendon, or Bone	1.12	32.88	1.223	1.180	1.268	1.21	32.44	1.246	1.203	1.291	1.18	31.86	1.226	1.183	1.270
HCC158 Pressure Ulcer of Skin with Full Thickness Skin Loss	1.58	31.92	1.201	1.164	1.240	1.76	31.05	1.190	1.154	1.227	1.80	31.06	1.207	1.169	1.245
HCC159 Pressure Ulcer of Skin with Partial Thickness Skin Loss	1.45	26.86	1.094	1.059	1.131	1.43	26.19	1.108	1.072	1.146	1.48	26.14	1.129	1.092	1.167
HCC160 Pressure Pre-Ulcer Skin Changes or Unspecified Stage	3.72	28.53	1.075	1.047	1.103	3.02	28.12	1.100	1.070	1.131	3.09	27.72	1.095	1.065	1.126
HCC161 Chronic Ulcer of Skin, Except Pressure	3.16	25.69	1.018	0.991	1.047	3.16	25.81	1.059	1.030	1.088	3.17	25.25	1.039	1.010	1.068

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
HCC169 Vertebral Fractures without Spinal Cord Injury	3.58	23.29	1.037	1.010	1.065	3.47	22.66	1.035	1.007	1.063	3.47	22.08	1.017	0.989	1.046
HCC170 Hip Fracture/ Dislocation	5.65	21.78	0.938	0.925	0.952	5.51	21.47	0.935	0.921	0.949	5.37	21.15	0.943	0.929	0.958
HCC176 Complications of Specified Implanted Device	4.76	30.02	1.046	1.020	1.073	4.66	29.36	1.060	1.033	1.088	4.72	28.94	1.068	1.041	1.097
HCC177 Other Complications of Medical Care	10.74	28.46	1.036	1.013	1.061	9.39	28.46	1.049	1.025	1.074	8.62	27.97	1.050	1.024	1.075
HCC186 Major Organ Transplant or Replacement Status	0.16	39.16	1.243	1.152	1.341	0.18	37.18	1.201	1.117	1.291	0.20	37.32	1.203	1.123	1.289
HCC188 Artificial Openings for Feeding or Elimination	2.22	32.89	1.214	1.179	1.250	2.12	32.26	1.219	1.184	1.256	2.20	32.19	1.240	1.204	1.278
HCC197 Supplemental Oxygen	2.26	32.47	1.229	1.194	1.265	2.56	31.91	1.226	1.192	1.261	3.11	31.23	1.221	1.188	1.256
HCC: Advanced Chronic Kidney Disease and Dialysis (134, 135, 136, 137)	27.67	30.22	1.207	1.181	1.234	29.91	29.46	1.226	1.199	1.253	31.08	29.01	1.235	1.208	1.263
HCC134 Dialysis Status	2.02	39.18	—	—	—	2.13	38.06	—	—	—	2.30	37.84	—	—	—
HCC135 Acute Renal Failure	23.43	29.45	—	—	—	25.56	28.72	—	—	—	26.51	28.24	—	—	—
HCC136 Chronic Kidney Disease, Stage 5	1.39	32.90	—	—	—	1.31	33.17	—	—	—	1.24	32.75	—	—	—
HCC137 Chronic Kidney Disease, Severe (Stage 4)	0.84	25.47	—	—	—	0.92	24.71	—	—	—	1.02	24.49	—	—	—
HCC: Cerebral or Ischemic Hemorrhage/ Stroke (99, 100)	4.95	27.60	1.082	1.055	1.109	4.86	27.36	1.107	1.080	1.136	4.80	26.81	1.102	1.074	1.131
HCC99 Cerebral Hemorrhage	0.97	28.24	—	—	—	0.97	27.94	—	—	—	1.01	28.00	—	—	—

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Table C1 (continued)
Final models, risk variable and odds ratios by year, 2009, 2010 and 2011

Label	2009 % with variable	2009 % with readm	2009 Odds Ratio	2009 LCL	2009 UCL	2010 % with variable	2010 % with readm	2010 Odds Ratio	2010 LCL	2010 UCL	2011 % with variable	2011 % with readm	2011 Odds Ratio	2011 LCL	2011 UCL
HCC100 Ischemic or Unspecified Stroke	3.98	27.44	—	—	—	3.89	27.21	—	—	—	3.78	26.49	—	—	—
Count of HCCs, if 2 or more	—	—	1.068	1.049	1.088	—	—	1.063	1.043	1.083	—	—	1.058	1.038	1.079
Square of count of HCCs, if 2 or more	—	—	0.995	0.995	0.996	—	—	0.995	0.995	0.995	—	—	0.995	0.995	0.996

Abbreviations and symbols: * indicates the referent category. LCL = lower confidence limit for the odds ratio; UCL = upper confidence interval for the odds ratio

NOTE: Sample sizes for each file year: 2009 = 2,191,546 index stays in 16,713 SNFs; 2010 =2,200,685 index stays in 16,671 SNFs; 2011 = 2,215,398 index stays in 16,656 SNFs. Unadjusted readmission rates for each file year: 2009 = 21.71%; 2010 = 21.36%; 2011 = 21.08%.

SOURCE: RTI analysis of Medicare claims (MedPAR files 2009, 2010, 2011). Program: \\wallsas03.waltham.rti.org\vol1\hipaa\0211942.004_PGM\100.008\pgm\stan\programs\ readmit104_idxSNF02_HLMFinal_inclDth.sas, readmit107_idxSNF02_BiVar_Descript_Model_nomiss_ForTable.sas

Social Determinants of Health (SDOH) Screening
Steward: Rhode Island Executive Office of Health and Human Services
As of 7/8/2019

SUMMARY OF CHANGES FOR 2020 (PERFORMANCE YEAR 3)

- Clarified that the screening should be performed once per measurement year.
- Added the anchor date of December 31 for retrospective attribution for the eligible population.
- Added an event definition for primary care visit. A primary care visit is required for a member to be in the eligible population.
- Added members in hospice care as an acceptable exclusion.
- Added units of measurement, requiring that adolescents and adults each have an individual screen complete. For children 12 and under, one screen may be completed for all children 12 or under residing in the same household, so long as the results of the screen are documented in each child's medical record.
- Revised documentation requirements to clarify that the screening results must either be embedded in the EHR or a PDF of the screening results must be accessible in the EHR.
- Revised the domains required for screening to be: housing insecurity, food insecurity, transportation, interpersonal violence, and utilities assistance.

Description

Social Determinants of Health are the "conditions in the places where people live, learn, work, and play [that] affect a wide range of health risks and outcomes."[1]

The percentage of attributed patients who were screened for Social Determinants of Health using a screening tool once per measurement year, where the primary care clinician has documented the completion of the screening and the results. Please note that for organizations participating in the Medicaid Accountable Entity (AE) program, the screening tool must be approved by EOHHS to count as meeting numerator requirements.

Eligible Population

Note: *Patients in hospice care or who refuse to participate are excluded from the eligible population. Additional details on exclusions can be found below.*

Product lines	Medicaid, Commercial
Stratification	None
Ages	All ages
Continuous enrollment	Enrolled in the MCO for 11 out of 12 months during the measurement year.
Allowable gap	No break in coverage lasting more than 45 days.
Anchor date	December 31 of the measurement year.
Lookback period	12 months
Benefit	Medical
Event/diagnosis	• The patient has been seen by an AE/ACO-affiliated primary care clinician anytime within the last 12 months

[1] Definition from the CDC: www.cdc.gov/socialdeterminants/index.htm. Last accessed on 3/18/19.

	• For the purpose of this measure "primary care clinician" is any provider defined by the reporting managed care organization as a primary care clinician and holding a patient panel. • The following are the eligible CPT/HCPCS office visit codes for determining a primary care visit: 99201-99205; 99212-99215; 99324-99337; 99341-99350; 99381 – 99387; 99391-99397; 99490; 99495-99496
Exclusions	• Patients in hospice care (HEDIS Hospice Value Set) • Refused to participate

Electronic Data Specifications

The percentage of attributed patients who were screened for Social Determinants of Health using an EOHHS-approved screening tool, where the primary care practice has documentation of the completion of the screening, the date of the screen, and the results.

Denominator	The eligible population
Numerator	Individuals attributed to the primary care clinician who were screened for Social Determinants of Health once per measurement year and for whom results are in the primary care clinician's EHR.
Unit of measurement	Screens should be performed at the individual patient level for adults and adolescents. Screens may be performed at the individual patient level or the household level for all children 12 and under residing in one household, so long as the screening is documented in each child's medical record.
Documentation requirements	All screenings must be documented in the attributed primary care clinician's patient health record, regardless of if the primary care clinician screened the individual (or household, as applicable) or if the screen was performed by anyone else, including: another provider, the insurer or a community partner. The screening results must either be embedded in the EHR or a PDF of the screening results must be accessible in the EHR, i.e., the primary care clinician must not be required to leave the EHR to access a portal or other electronic location to view the screening results. Results for at least one question per required domain must be included for a screen to be considered numerator complaint.
Approved screening tools	For those participating in the AE program, all screening tools must be approved by EOHHS prior to the reporting period to be counted in the numerator. Screens performed with tools not approved by EOHHS shall not be included in the numerator of this measure.
Required domains	1. Housing insecurity; 2. Food insecurity; 3. Transportation; 4. Interpersonal violence; and 5. Utility assistance.

Statin Therapy for Patients With Cardiovascular Disease (SPC)

SUMMARY OF CHANGES TO HEDIS 2020

- Modified value sets to make them compatible with digital measure formatting.
- Clarified that the diagnosis must be on the discharge claim when identifying members discharged from an inpatient setting with an MI.
- Updated value sets to identify IVD acute inpatient events.
- Updated value sets used to identify advanced illness.
- Modified medication lists to make them compatible with digital measure formatting.
- Updated the method for identifying the same or different medications; high and moderate doses of a medication are considered different medications.
- Clarified in step 4 of the administrative specification of Rate 2 that the equation must be multiplied by 100 before rounding to the nearest whole number.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of males 21–75 years of age and females 40–75 years of age during the measurement year, who were identified as having clinical atherosclerotic cardiovascular disease (ASCVD) and met the following criteria. The following rates are reported:

1. *Received Statin Therapy.* Members who were dispensed at least one high-intensity or moderate-intensity statin medication during the measurement year.
2. *Statin Adherence 80%.* Members who remained on a high-intensity or moderate-intensity statin medication for at least 80% of the treatment period.

Definitions

IPSD	Index prescription start date. The earliest prescription dispensing date for any statin medication of at least moderate intensity during the measurement year.
Treatment period	The period of time beginning on the IPSD through the last day of the measurement year.
PDC	Proportion of days covered. The number of days the member is covered by at least one statin medication prescription of appropriate intensity, divided by the number of days in the treatment period.
Calculating number of days covered for multiple prescriptions	If multiple prescriptions for different medications are dispensed on the same day, calculate the number of days covered by a statin medication (for the numerator) using the prescriptions with the longest days supply. For multiple different prescriptions dispensed on different days with overlapping days supply, count each day in the treatment period only once toward the numerator. If multiple prescriptions for the same medication are dispensed on the same day or on different days, sum the days supply and use the total to calculate the number of days covered by a statin medication (for the numerator). For

example, three prescriptions for the same medication are dispensed on the same day, each with a 30-day supply. Sum the days supply for a total of 90 days covered by a statin. Subtract any days supply that extends beyond December 31 of the measurement year.

Use the medication lists to determine if drugs are the same or different. Drugs in different medication lists are considered different drugs. For example, a dispensing event from the Amlodipine Atorvastatin High Intensity Medications List and a dispensing event from the Amlodipine Atorvastatin Moderate Intensity Medications List are dispensing events for different medications.

Eligible Population: Rate 1—Received Statin Therapy

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product line Commercial, Medicaid, Medicare (report each product line separately).

Age Report two age/gender stratifications and a total rate.

- Males 21–75 years as of December 31 of the measurement year.
- Females 40–75 years as of December 31 of the measurement year.
- Total.

Continuous enrollment The measurement year and the year prior to the measurement year.

Allowable gap No more than one gap in enrollment of up to 45 days during each year of continuous enrollment. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).

Anchor date December 31 of the measurement year.

Benefit Medical. Pharmacy during the measurement year.

Event/Diagnosis Follow the steps below to identify the eligible population.

Step 1 Members are identified for the eligible population in two ways: by event or by diagnosis. The organization must use *both* methods to identify the eligible population, but a member only needs to be identified by one method to be included in the measure.

Event. Any of the following during the year prior to the measurement year meet criteria:

- *MI.* Discharged from an inpatient setting with an MI (MI Value Set) on the discharge claim. To identify discharges:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Identify the discharge date for the stay.
- *CABG.* Members who had CABG (CABG Value Set) in any setting.
- *PCI.* Members who had PCI (PCI Value Set) in any setting.

- *Other revascularization*. Members who had any other revascularization procedures (Other Revascularization Value Set) in any setting.

Diagnosis. Identify members as having ischemic vascular disease (IVD) who met at least one of the following criteria during both the measurement year and the year prior to the measurement year. Criteria need not be the same across both years.

- At least one outpatient visit (Outpatient Value Set) with an IVD diagnosis (IVD Value Set).
- A telephone visit (Telephone Visits Value Set) with an IVD diagnosis (IVD Value Set).
- An online assessment (Online Assessments Value Set) with an IVD diagnosis (IVD Value Set).
- At least one acute inpatient encounter (Acute Inpatient Value Set) with an IVD diagnosis (IVD Value Set) ***without*** telehealth (Telehealth Modifier Value Set; Telehealth POS Value Set).
- At least one acute inpatient discharge with a principal diagnosis of IVD (IVD Value Set) on the discharge claim. To identify an acute inpatient discharge:
  1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
  2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
  3. Identify the discharge date for the stay.

Only one of the two visits may be an outpatient telehealth visit, a telephone visit or an online assessment. Identify outpatient telehealth visits by the presence of a telehealth modifier (Telehealth Modifier Value Set) or the presence of a telehealth POS code (Telehealth POS Value Set) associated with the outpatient visit.

Step 2: Required exclusions

Exclude members who meet any of the following criteria:

- Female members with a diagnosis of pregnancy (Pregnancy Value Set) during the measurement year or the year prior to the measurement year.
- In vitro fertilization (IVF Value Set) in the measurement year or year prior to the measurement year.
- Dispensed at least one prescription for clomiphene (Estrogen Agonists Medications List) during the measurement year or the year prior to the measurement year.
- ESRD (ESRD Diagnosis Value Set) or dialysis (Dialysis Procedure Value Set) during the measurement year or the year prior to the measurement year.
- Cirrhosis (Cirrhosis Value Set) during the measurement year or the year prior to the measurement year.
- Myalgia, myositis, myopathy or rhabdomyolysis (Muscular Pain and Disease Value Set) during the measurement year.

Estrogen Agonists Medications

Description	Prescription
Estrogen agonists	• Clomiphene

Step 3: Exclusions Exclude members who meet any of the following criteria:

Note: *Supplemental and medical record data may not be used for these exclusions.*

- Medicare members 66 years of age and older as of December 31 of the measurement year who meet either of the following:
  - Enrolled in an Institutional SNP (I-SNP) any time during the measurement year.
  - Living long-term in an institution any time during the measurement year as identified by the LTI flag in the Monthly Membership Detail Data File. Use the run date of the file to determine if a member had an LTI flag during the measurement year.
- Members 66 years of age and older as of December 31 of the measurement year (all product lines) with frailty ***and*** advanced illness. Members must meet *both* of the following frailty and advanced illness criteria to be excluded:
  1. At least one claim/encounter for frailty (Frailty Device Value Set; Frailty Diagnosis Value Set; Frailty Encounter Value Set; Frailty Symptom Value Set) during the measurement year.
  2. Any of the following during the measurement year or the year prior to the measurement year (count services that occur over both years):
     - At least two outpatient visits (Outpatient Value Set), observation visits (Observation Value Set), ED visits (ED Value Set), nonacute inpatient encounters (Nonacute Inpatient Value Set) or nonacute inpatient discharges (instructions below; the diagnosis must be on the discharge claim) on different dates of service, with an advanced illness diagnosis (Advanced Illness Value Set). Visit type need not be the same for the two visits. To identify a nonacute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
       2. Confirm the stay was for nonacute care based on the presence of a nonacute code (Nonacute Inpatient Stay Value Set) on the claim.
       3. Identify the discharge date for the stay.
     - At least one acute inpatient encounter (Acute Inpatient Value Set) with an advanced illness diagnosis (Advanced Illness Value Set).
     - At least one acute inpatient discharge with an advanced illness diagnosis (Advanced Illness Value Set). To identify an acute inpatient discharge:
       1. Identify all acute and nonacute inpatient stays (Inpatient Stay Value Set).
       2. Exclude nonacute inpatient stays (Nonacute Inpatient Stay Value Set).
       3. Identify the discharge date for the stay.
     - A dispensed dementia medication (Dementia Medications List).

Dementia Medications

Description	Prescription
Cholinesterase inhibitors	• Donepezil • Galantamine • Rivastigmine
Miscellaneous central nervous system agents	• Memantine

Administrative Specification: Rate 1—Received Statin Therapy

Denominator The Rate 1 eligible population.

Numerator The number of members who had at least one dispensing event for a high-intensity or moderate-intensity statin medication during the measurement year. Use all the medication lists below to identify statin medication dispensing events.

High- and Moderate-Intensity Statin Medications

Description	Prescription	Medication Lists
High-intensity statin therapy	• Atorvastatin 40-80 mg	Atorvastatin High Intensity Medications List
High-intensity statin therapy	• Amlodipine-atorvastatin 40-80 mg	Amlodipine Atorvastatin High Intensity Medications List
High-intensity statin therapy	• Rosuvastatin 20-40 mg	Rosuvastatin High Intensity Medications List
High-intensity statin therapy	• Simvastatin 80 mg	Simvastatin High Intensity Medications List
High-intensity statin therapy	• Ezetimibe-simvastatin 80 mg	Ezetimibe Simvastatin High Intensity Medications List
Moderate-intensity statin therapy	• Atorvastatin 10-20 mg	Atorvastatin Moderate Intensity Medications List
Moderate-intensity statin therapy	• Amlodipine-atorvastatin 10-20 mg	Amlodipine Atorvastatin Moderate Intensity Medications List
Moderate-intensity statin therapy	• Rosuvastatin 5-10 mg	Rosuvastatin Moderate Intensity Medications List
Moderate-intensity statin therapy	• Simvastatin 20-40 mg	Simvastatin Moderate Intensity Medications List
Moderate-intensity statin therapy	• Ezetimibe-simvastatin 20-40 mg	Ezetimibe Simvastatin Moderate Intensity Medications List
Moderate-intensity statin therapy	• Pravastatin 40-80 mg	Pravastatin Moderate Intensity Medications List
Moderate-intensity statin therapy	• Lovastatin 40 mg	Lovastatin Moderate Intensity Medications List
Moderate-intensity statin therapy	• Fluvastatin 40-80 mg	Fluvastatin Moderate Intensity Medications List
Moderate-intensity statin therapy	• Pitavastatin 2–4 mg	Pitavastatin Moderate Intensity Medications List

Eligible Population: Rate 2—Statin Adherence 80%

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product line	Commercial, Medicaid, Medicare (report each product line separately).
Age	Report two age/gender stratifications and a total rate. • Males 21–75 years as of December 31 of the measurement year. • Females 40–75 years as of December 31 of the measurement year. • Total.
Continuous enrollment	The measurement year and the year prior to the measurement year.
Allowable gap	No more than one gap in enrollment of up to 45 days during each year of continuous enrollment. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).
Anchor date	December 31 of the measurement year.
Benefit	Medical. Pharmacy during the measurement year.
Event/diagnosis	All members who meet the numerator criteria for Rate 1.

Administrative Specification: Rate 2—Statin Adherence 80%

Denominator	The Rate 2 eligible population.
Numerator	The number of members who achieved a PDC of at least 80% during the treatment period. Follow the steps below to identify numerator compliance.
Step 1	Identify the IPSD. The IPSD is the earliest dispensing event for any high-intensity or moderate-intensity statin medication during the measurement year. Use all the medications lists above to identify statin medication dispensing events.
Step 2	To determine the treatment period, calculate the number of days beginning on the IPSD through the end of the measurement year.
Step 3	Count the days covered by at least one prescription for any high-intensity or moderate-intensity statin medication during the treatment period. To ensure that days supply that extends beyond the measurement year is not counted, subtract any days supply that extends beyond December 31 of the measurement year.
Step 4	Calculate the member's PDC using the following equation. Multiply the equation by 100 and round (using the .5 rule) to the nearest whole number. For example, if a member has 291 total days covered by a medication during a 365-day treatment period, this calculates to 0.7972. Multiply this number by 100, convert it to 79.72% and round it to 80%, the nearest whole number.

$$\frac{\text{Total Days Covered by a Statin Medication in the Treatment Period (step 3)}}{\text{Total Days in Treatment Period (step 2)}}$$

Step 5 Sum the number of members whose PDC is ≥80% for the treatment period.

Note

- *All members who are numerator compliant for Rate 1 must be used as the eligible population for Rate 2 (regardless of the data source used to capture the Rate 1 numerator). For example, if supplemental data were used to identify compliance for the Rate 1 numerator, then supplemental data will be included in identifying the Rate 2 eligible population.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table SPC-1/2/3: Data Elements for Statin Therapy for Patients With Cardiovascular Disease

Data Elements	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	*Each rate, for each age/gender stratification and total*
Number of required exclusions	*Rate 1, for each age/gender stratification and total*
Numerator events by administrative data	*Each rate, for each age/gender stratification and total*
Numerator events by supplemental data	*Each rate, for each age/gender stratification and total*
Reported rate	*Each rate, for each age/gender stratification and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Statin Therapy for Patients With Cardiovascular Disease

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Using product line criteria is not required. Including any product line, combining product lines, or not including product line criteria is allowed.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age as of June 30"). The denominator age may be changed if the range is within the specified age range (ages 21–75 or 40–75 years). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Only events that contain (or map to) codes in the value sets may be used to identify discharges. Value sets and logic may not be changed.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Required Exclusions	No	Apply required exclusions according to specified value sets and medication lists.
Exclusions: I-SNP, LTI, Frailty or Advanced Illness	Yes	These exclusions are not required. Refer to *Exclusions* in the *Guidelines for the Rules for Allowable Adjustments*.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• Rate 1: Received statin therapy • Rate 2: Statin adherence 80%	No	Medication lists, value sets and logic may not be changed.

Specifications Manual for Joint Commission National Quality Measures (v2019A)

Print this page

Release Notes:
Measure Information Form
Version 2019A

****NQF-ENDORSED VOLUNTARY CONSENSUS STANDARDS FOR HOSPITAL CARE****

Measure Information Form

Measure Set: Stroke (STK)

Set Measure ID: STK-4

Performance Measure Name: Thrombolytic Therapy

Description: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV alteplase was initiated at this hospital within 3 hours of time last known well.

Rationale: The administration of IV alteplase to carefully screened, eligible patients with acute ischemic stroke has been shown to be beneficial in several clinical trials. These included two positive randomized controlled trials in the United States: The National Institute of Neurological Disorders and Stroke (NINDS) Studies, Part I and Part II. Based on the results of these studies, the Food and Drug Administration (FDA) approved the use of intravenous alteplase for the treatment of acute ischemic stroke when given within 3 hours of stroke symptom onset. A large meta-analysis controlling for factors associated with stroke outcome confirmed the benefit of IV alteplase in patients treated within 3 hours of symptom onset. Physicians with experience and skill in stroke management and the interpretation of CT scans should supervise treatment.

The European Cooperative Acute Stroke Study (ECASS) III trial indicated that intravenous rtPA can be given safely to, and can improve outcomes for, carefully selected patients treated 3 to 4.5 hours after stroke; however, as the NINDS investigators concluded, the earlier that IV thrombolytic therapy is initiated, the better the patient outcome. Therefore, the target for IV alteplase initiation remains within 3 hours of time last known well. The administration of IV alteplase beyond 3 hours of stroke symptom onset has not been FDA approved.

Although the benefit of IV alteplase has been well established, only a minority of patients with acute ischemic stroke actually receive this medication across the United States. Recent recommendations from the American Heart Association/American Stroke Association and FDA remove or make less specific many previous contraindications and warnings for therapy.

Type Of Measure: Process

Improvement Noted As: Increase in the rate

Numerator Statement: Acute ischemic stroke patients for whom IV alteplase was initiated at this hospital within 3 hours (less than or equal to 180 minutes) of time last known well.

Included Populations: Not applicable

Excluded Populations: None

Data Elements:

- *Date Last Known Well*
- *IV Alteplase Initiation*
- *IV Alteplase Initiation Date*
- *IV Alteplase Initiation Time*
- *Time Last Known Well*

Denominator Statement: Acute ischemic stroke patients whose time of arrival is within 2 hours (less than or equal to 120 minutes) of time last known well.

Included Populations: Discharges with an ICD-10-CM Principal Diagnosis Code for ischemic stroke as defined in Appendix A, Table 8.1

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients enrolled in clinical trials
- Patients admitted for Elective Carotid Intervention
- Time Last Known Well to arrival in the emergency department greater than 2 hours
- Patients with a documented Reason For Extending the Initiation of IV Alteplase
- Patients with a documented Reason For Not Initiating IV Alteplase

Data Elements:

- *Admission Date*
- *Arrival Date*
- *Arrival Time*
- *Birthdate*
- *Clinical Trial*
- *Date Last Known Well*
- *Discharge Date*
- *ED Patient*
- *Elective Carotid Intervention*
- *ICD-10-CM Principal Diagnosis Code*
- *Last Known Well*
- *Reason for Extending the Initiation of IV Alteplase*
- *Reason for Not Initiating IV Alteplase*
- *Time Last Known Well*

Risk Adjustment: No.

Data Collection Approach: Retrospective data sources for required data elements include administrative data and medical records. Some hospitals may prefer to gather data concurrently by identifying patients in the population of interest. This approach provides opportunities for improvement at the point of care/service. However, complete documentation includes the principal or other ICD-10 diagnosis and procedure codes, which require retrospective data entry.

Data Accuracy: Variation may exist in the assignment of ICD-10 codes; therefore, coding practices may require evaluation to ensure consistency.

Measure Analysis Suggestions: None

Sampling: Yes. Please refer to the measure set specific sampling requirements and for additional information see the Population and Sampling Specifications section.

Data Reported As: Aggregate rate generated from count data reported as a proportion.

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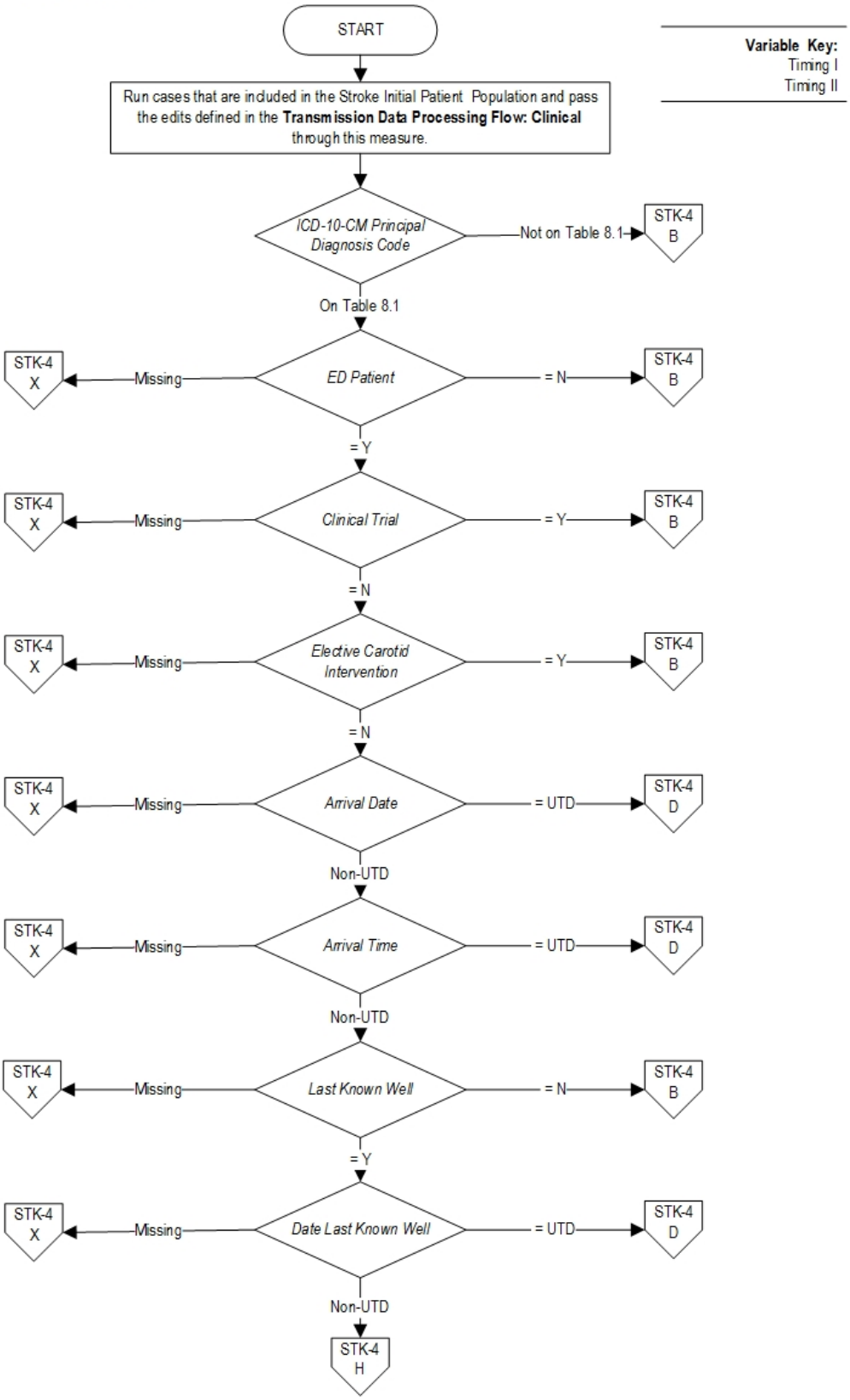
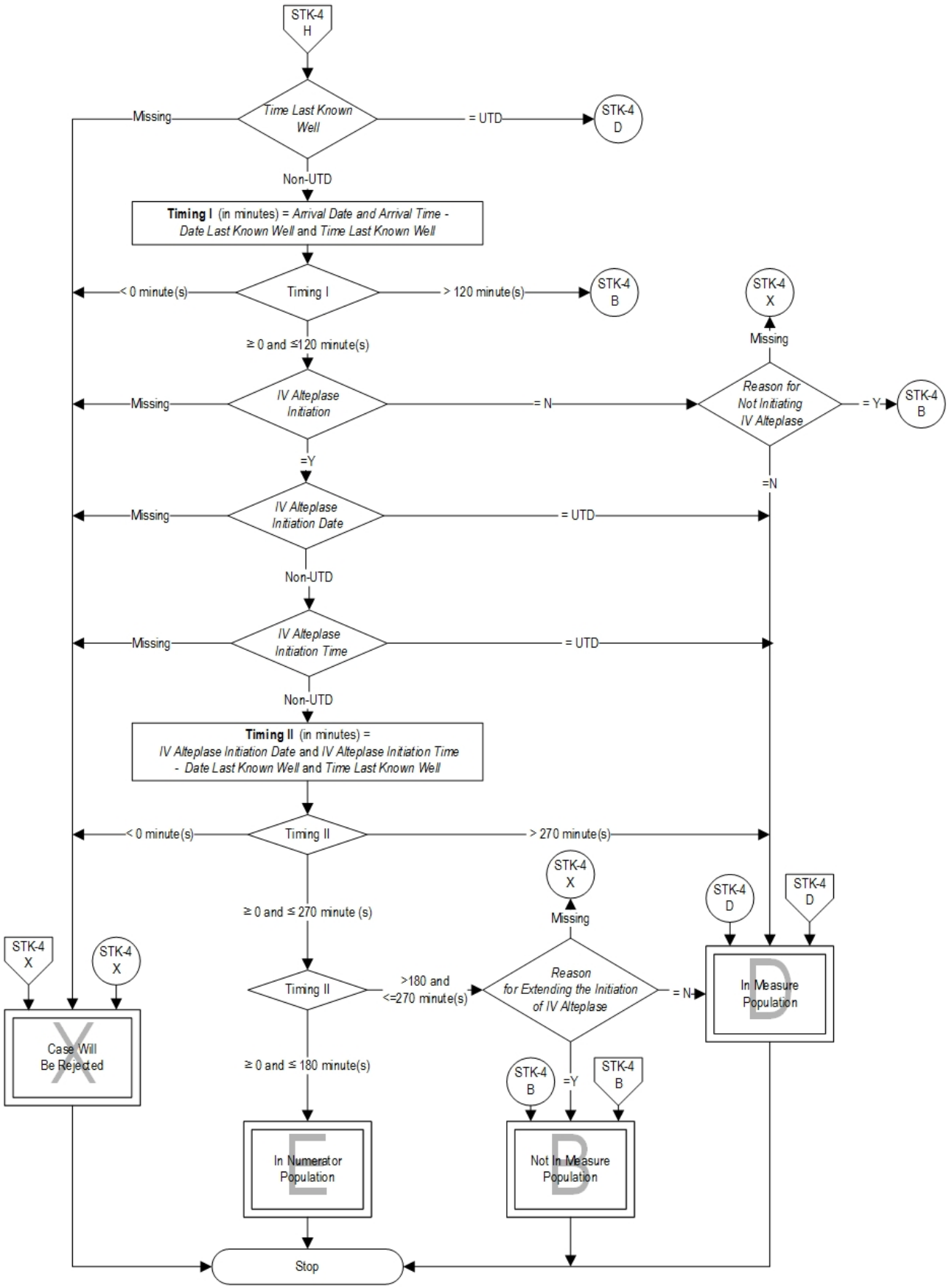
Measure Algorithm:

STK - 4: Thrombolytic Therapy

Numerator: Acute ischemic stroke patients for whom IV alteplase therapy was initiated at this hospital within 3 hours (≤ 180 minutes) of time last known well.

Denominator: Acute ischemic stroke patients whose time of arrival is within 2 hours (≤ 120 minutes) of time last known well.





Measure Information Form STK-4

Specifications Manual for Joint Commission National Quality Measures (v2019A)
Discharges 07-01-19 (3Q19) through 12-31-19 (4Q19)

Timely Transmission of Transition Record (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

NQF Endorsement Status	Endorsement Removed
NQF ID	0648
Measure Type	Process
Measure Content Last Updated	2018-06-08
Last Updated in CMIT	2017-06-28 00:00:00.0

Properties

Description	Percentage of patients, regardless of age, discharged from an inpatient facility (e.g., hospital inpatient or observation, skilled nursing facility, or rehabilitation facility) to home or any other site of care for whom a transition record was transmitted to the facility or primary physician or other health care professional designated for follow-up care within 24 hours of discharge
Numerator	Patients for whom a transition record was transmitted to the facility or primary physician or other health care professional designated for follow-up care within 24 hours of discharge
Denominator	All patients, regardless of age, discharged from an inpatient facility (e.g., hospital inpatient or observation, skilled nursing facility, or rehabilitation facility) to home/self care or any other site of care
Denominator Exclusions	Patients who died Patients who left against medical advice (AMA) or discontinued care
Rationale	This measure is important to decrease cost, address gaps in care, and enhance coordination of communication. Cost * In 2006, there were over 39 million hospital discharges; of those, 13 percent of these patients are repeatedly hospitalized and use 60 percent of the healthcare resources. * A 2007 report by the Medicare Payment Advisory Commission estimated approximately 18 percent of admissions result in readmissions within 30 days, costing CMS $15 billion. Gaps in Care: * Sabogal and colleagues found that uncoordinated transitions between sites of care, even within the same

Timely Transmission of Transition Record (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

institution, and between caregivers increase hospital readmissions, medical errors, duplication of services, and waste of resources. * Moore and colleagues examined three types of discontinuity of care among older patients transferred from the hospital: medication, test result follow-up, and initiation of a recommended work-up. They found that nearly 50 percent of hospitalized patients experienced at least one discontinuity and that patients who did not have a recommended work-up initiated were six times more likely to be re-hospitalized. * A prospective, cross-sectional study by Roy and colleagues found that approximately 40 percent of patients have pending test results at the time of discharge and that 10 percent of these require some ac Emergency Department Visits * The 2008 National Health Statistics Report determined that 2.3 million (2 percent) emergency department visits are from patients who were discharged from the hospital within the previous 7 days. The report also cited the following: * Ten percent of the 2.3 million emergency department visits were for complications related to their recent hospitalization, and * The uninsured are 3 times more likely to visit the emergency department. Medication errors: * An estimated 60 percent of medication errors occur during times of transition: upon admission, transfer, or discharge of a patient. * During care transitions, patients receive medications from different prescribers who rarely have access to patients' comprehensive medication list. * Forster and colleagues found that 19 percent of discharged patients experienced an associated adverse event within three weeks of leaving the hospital; 66 percent of these were adverse drug events. Coleman EA, Min S, Chomiak A, Kramer AM. 2004. Post-hospital care transitions: patterns, complications, and risk identification. Health Services Research 39:1449-1465. Agency for Healthcare Research and Quality (ARHQ). 1999. Outcomes by Patient and Hospital Characteristics for All Discharges. Available at: http://www.ahrq.gov/HCUPnet.asp. Kramer A, Eilertsen T, Lin M, Hutt E. 2000. Effects of nurse staffing on hospital transfer quality measures for new admissions. Pp. 9.1-9.22. Inappropriateness of Minimum Nurse Staffing Ratios for Nursing Homes. Health Care Financing Administration. Hutt E, Ecord M, Eilertsen TB, et al. Precipitants of emergency room visits and acute hospitalization in short-stay Medicare nursing home residents. J Am Geriatr Soc 2001; 50: 223-229. Jack BW, Chetty VK, Anthony D, et al. A reengineered hospital discharge program to decrease rehospitalization. Ann Intern Med

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	Healthcare Research and Quality (ARHQ). 2006. Outcomes by Patient and Hospital Characteristics for All Discharges. Available at: http://www.ahrq.gov/HCUPnet.asp. Medicare Payment Advisory Commission. A data book: Healthcare spending and the Medicare program. June 2007. Available at: http://www.medpac.gov/documents/Jun07DataBook_Entire_report.pdf. Harris G. Report finds a heavy toll from medication errors, N.Y. Times (July 21, 2006). Available at: http://www.nytimes.com/2006/07/21/health/21drugerrors.html ex=1311134400&en=8f34018d05534d7a&ei=508 8&partner=rssnyt&emc=rss. Sabogal F, Coots-Miyazaki M, Lett JE. Effective care transitions interventions:
Evidence	Not Available

Developer/Steward

Steward	American Medical Association - Physician Consortium for Performance Improvement (AMA-PCPI)
Contact	Not Available
Measure Developer	Not Available
Development Stage	Fully Developed

Characteristics

Measure Type	Process
Meaningful Measure	Transfer of Health Information and Interoperability
Healthcare Priority	Promoting Effective Communication and Coordination of Care
eCQM Spec Available	Not Available
NQF Endorsement Status	Endorsement Removed

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NQF ID	0648
Last NQF Update	2017-06-28
Target Population Age	Not Specified
Target Population Age (High)	Not Available
Target Population Age (Low)	Not Available
Reporting Level	Facility
Conditions	Not Available
Subconditions	Not Available
Care Settings	Hospital Outpatient Surgery Department/Ambulatory Surgery Center, Hospital/Acute Care Facility, Inpatient Rehabilitation Facility, Nursing Home

Groups

Core Measure Set	Not Available

Measure Group	Group Identifier
Medicaid Adult Core Measure	

Measure Links

Measure Program: Hospital Compare

Data Sources	Administrative Claims, EHR, Paper Medical Records

Timely Transmission of Transition Record (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

Purposes	
Quality Domain	Not Available

Measure Program Links

Current Measure Status

Status: Implemented

Effective Date	2017-10-01 00:00:00.0000000
Comments	Not Available
Status Links	https://www.federalregister.gov/articles/2015/08/05/2015-18903/medicare-program-inpatient-psychiatric-facilities-prospective-payment-system-update-for-fiscal-year

Historical Statuses

Status: Finalized

Effective Date	2015-08-05 00:00:00.0000000
Comments	Not Available
Status Links	https://www.federalregister.gov/articles/2015/08/05/2015-18903/medicare-program-inpatient-psychiatric-facilities-prospective-payment-system-update-for-fiscal-year

Status: Reference

Effective Date	1900-01-01 00:00:00.0000000

Timely Transmission of Transition Record (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

Comments	Not Available
Status Links	https://www.medicare.gov/hospitalcompare/search.html https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228773989482 https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/hospitalqualityinits/hospitalcompare.html

Measure Program: Inpatient Psychiatric Facility Quality Reporting

Data Sources	Administrative Claims, EHR, Paper Medical Records, Electronic Clinical Data
Purposes	
Quality Domain	Not Available

Measure Program Links

Current Measure Status

Status: Finalized

Effective Date	2015-08-05 00:00:00.0000000
Comments	Not Available
Status Links	https://www.federalregister.gov/articles/2015/08/05/2015-18903/medicare-program-inpatient-psychiatric-facilities-prospective-payment-system-update-for-fiscal-year https://www.gpo.gov/fdsys/pkg/FR-2016-08-22/pdf/2016-18476.pdf

Timely Transmission of Transition Record (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

Upcoming Status Changes

Status: Implemented

Effective Date	2018-10-01 00:00:00.0000000
Comments	Not Available
Status Links	https://www.federalregister.gov/articles/2015/08/05/2015-18903/medicare-program-inpatient-psychiatric-facilities-prospective-payment-system-update-for-fiscal-year https://www.gpo.gov/fdsys/pkg/FR-2016-08-22/pdf/2016-18476.pdf

Historical Statuses

Status: Proposed

Effective Date	2015-05-01 00:00:00.0000000
Comments	Not Available

Status: Reference

Effective Date	1900-01-01 00:00:00.0000000
Comments	Not Available
Status Links	https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228773989482 https://www.gpo.gov/fdsys/pkg/FR-2016-08-22/pdf/2016-18476.pdf

Measure Program: Medicaid

Timely Transmission of Transition Record (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

Data Sources	Paper Medical Records, Claims, EHR, Administrative Claims, Electronic Clinical Data
Purposes	
Quality Domain	Not Available

Measure Program Links

Current Measure Status

Status: Removed

Effective Date	2018-01-01 00:00:00.0000000
Comments	Not Available

Historical Statuses

Status: Proposed

Effective Date	2015-05-01 00:00:00.0000000
Comments	Not Available

Status: Implemented

Effective Date	2012-01-02 00:00:00.0000000
Comments	Not Available
Status Links	https://www.medicaid.gov/medicaid-chip-program-information/by-topics/quality-of-care/adult-health-care-quality-measures.html

Timely Transmission of Transition Record (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

Status: Finalized

Effective Date	2012-01-01 00:00:00.0000000
Comments	Not Available

Status: Reference

Effective Date	1900-01-01 00:00:00.0000000
Comments	Not Available
Status Links	https://www.medicaid.gov/medicaid-chip-program-information/by-topics/quality-of-care/adult-health-care-quality-measures.html

Quality ID #402: Tobacco Use and Help with Quitting Among Adolescents
– National Quality Strategy Domain: Community/Population Health
– Meaningful Measure Area: Prevention and Treatment of Opioid and Substance Use Disorders

2019 COLLECTION TYPE:
MIPS CLINICAL QUALITY MEASURES (CQMS)

MEASURE TYPE:
Process

DESCRIPTION:
The percentage of adolescents 12 to 20 years of age with a primary care visit during the measurement year for whom tobacco use status was documented and received help with quitting if identified as a tobacco user

INSTRUCTIONS:
This measure is to be submitted **once per performance period** for patients seen during the performance period. This measure is intended to reflect the quality of services provided for preventive screening for tobacco use. This measure may be submitted by Merit-based Incentive Payment System (MIPS) eligible clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

Measure Submission Type:
Measure data may be submitted by individual MIPS eligible clinicians, groups, or third party intermediaries. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure. The quality-data codes listed do not need to be submitted by MIPS eligible clinicians, groups, or third party intermediaries that utilize this modality for submissions; however, these codes may be submitted for those third party intermediaries that utilize Medicare Part B claims data. For more information regarding Application Programming Interface (API), please refer to the Quality Payment Program (QPP) website.

DENOMINATOR:
All patients aged 12-20 years with a visit during the measurement period

Denominator Criteria (Eligible Cases):
Patients aged 12-20 years on date of encounter
AND
Patient encounter during the performance period (CPT or HCPCS): 90791, 90792, 90832, 90834, 90837, 90839, 90845, 92002, 92004, 92012, 92014, 96150, 96151, 96152, 97165, 97166, 97167, 97168, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99406, 99407, G0438, G0439

NUMERATOR:
Patients who were screened for tobacco use at least once within 18 months (during the measurement period or the six months prior to the measurement period) **AND** who received tobacco cessation counseling intervention if identified as a tobacco user

Definitions:
Tobacco Use Status – Any documentation of smoking or tobacco use status, including 'never' or 'non-use'.
Tobacco User – Any documentation of active or current use of tobacco products, including smoking.

NUMERATOR NOTE: *In the event that a patient is screened for tobacco use and identified as a user but did not receive tobacco cessation counseling submit* ***G9460****.*

Numerator Options:

Performance Met:	Patient documented as tobacco user AND received tobacco cessation intervention (must include at least one of the following: advice given to quit smoking or tobacco use, counseling on the benefits of quitting smoking or tobacco use, assistance with or referral to external smoking or tobacco cessation support programs, or current enrollment in smoking or tobacco use cessation program) if identified as a tobacco user **(G9458)**
OR	
Performance Met:	Currently a tobacco non-user **(G9459)**
OR	
Performance Not Met:	Tobacco assessment OR tobacco cessation intervention not performed, reason not given **(G9460)**

RATIONALE:

This measure is intended to promote adolescent tobacco screening and tobacco cessation interventions for those who use tobacco products. There is good evidence that tobacco screening and brief cessation intervention (including counseling and/or pharmacotherapy) is successful in helping tobacco users quit. Tobacco users who are able to stop smoking lower their risk for heart disease, lung disease, and stroke.

CLINICAL RECOMMENDATION STATEMENTS:

The following evidence statements are quoted verbatim from the referenced clinical guidelines:

The U.S. Preventive Services Task Force recommends that primary care clinicians provide interventions, including education or brief counseling, to prevent initiation of tobacco use in school-aged children and adolescents. (Strength of Recommendation = B) (U.S. Preventive Services Task Force, 2013)

All patients should be asked if they use tobacco and should have their tobacco use status documented on a regular basis. Evidence has shown that clinic screening systems, such as expanding the vital signs to include tobacco use status or the use of other reminder systems such as chart stickers or computer prompts, significantly increase rates of clinician intervention. (Strength of Evidence = A) (U.S. Department of Health and Human Services. Public Health Service, 2008)

All physicians should strongly advise every patient who smokes to quit because evidence shows that physician advice to quit smoking increases abstinence rates. (Strength of Evidence = A) (U.S. Department of Health and Human Services. Public Health Service, 2008)

Minimal interventions lasting less than 3 minutes increase overall tobacco abstinence rates. Every tobacco user should be offered at least a minimal intervention, whether or not he or she is referred to an intensive intervention. (Strength of Evidence = A) (U.S. Department of Health and Human Services. Public Health Service, 2008)

The combination of counseling and medication is more effective for smoking cessation than either medication or counseling alone. Therefore, whenever feasible and appropriate, both counseling and medication should be provided to patients trying to quit smoking. (Strength of Evidence = A) (U.S. Department of Health and Human Services. Public Health Service, 2008)

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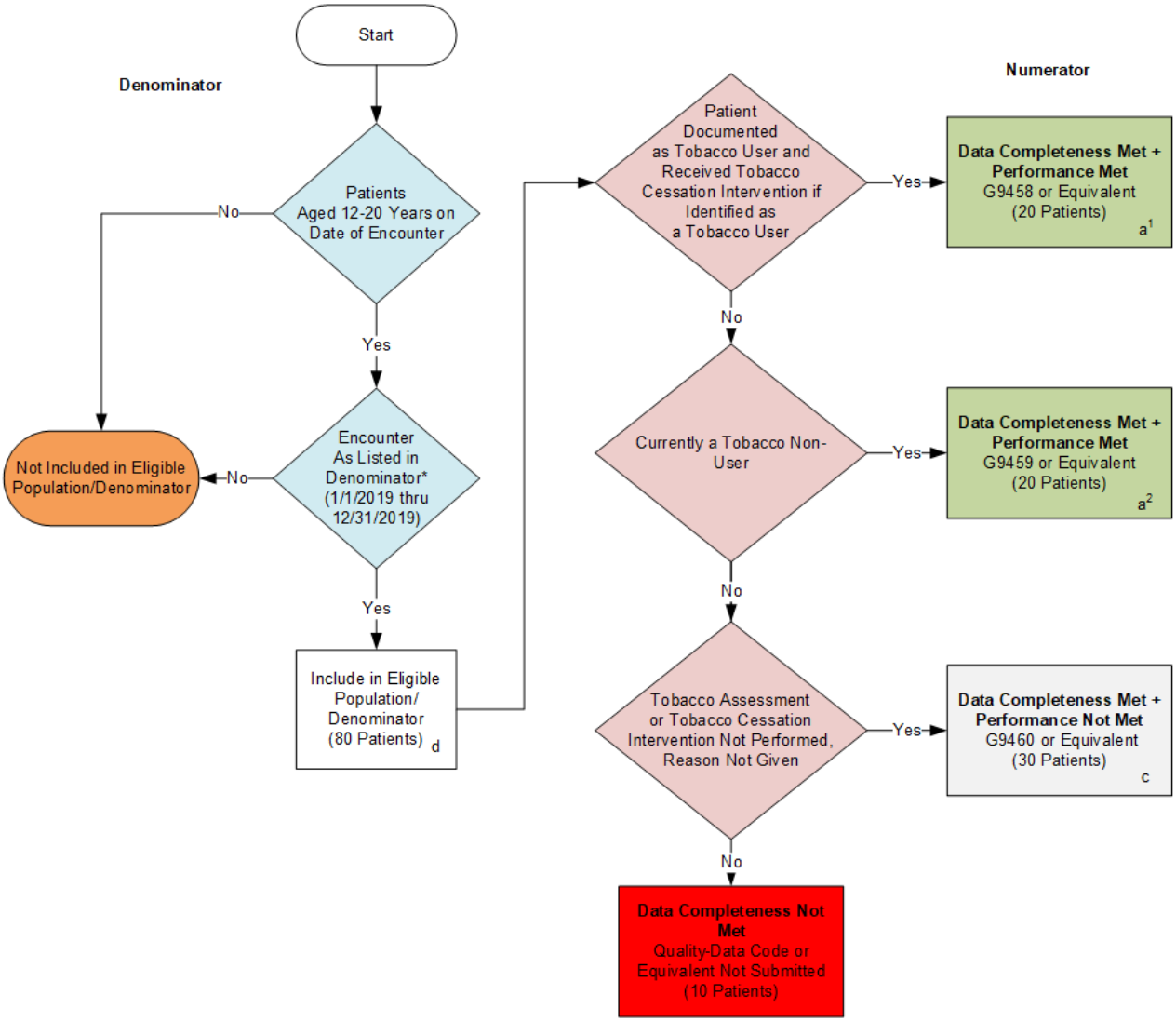
2019 Clinical Quality Measure Flow for Quality ID #402: Tobacco Use and Help with Quitting Among Adolescents



SAMPLE CALCULATIONS:

Data Completeness=

Performance Met (a^1+a^2=40 patients) + Performance Not Met (c=30 patients) = 70 patients = **87.50%**

Eligible Population / Denominator (d=80 patients) = 80 patients

Performance Rate=

Performance Met (a^1+a^2=40 patients) = 40 patients = **57.14%**

Data Completeness Numerator (70 patients) = 70 patients

*See the posted Measure Specification for specific coding and instructions to submit this measure.

NOTE: Submission Frequency: Patient-process

v3

2019 Clinical Quality Measure Flow Narrative for Quality ID #402: Tobacco Use and Help with Quitting Among Adolescents

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specification.

1. Start with Denominator
2. Check Patient Age:
    a. If Patients Age is 12-20 Years on Date of Encounter equals No during the measurement period, do not include in Eligible Population. Stop Processing.
    b. If Patients Age is 12-20 Years on Date of Encounter equals Yes during the measurement period, proceed to check Encounter Performed.
3. Check Encounter Performed:
    a. If Encounter as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.
    b. If Encounter as Listed in the Denominator equals Yes, include in Eligible Population.
4. Denominator Population:
    a. Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 80 patients in the Sample Calculation.
5. Start Numerator
6. Check Patient Documented as Tobacco User AND Received Tobacco Cessation Intervention if Identified as a Tobacco User:
    a. If Patient Documented as Tobacco User AND Received Tobacco Cessation Intervention if identified as a Tobacco User equals Yes, include in Data Completeness Met and Performance Met.
    b. Data Completeness Met and Performance Met letter is represented as Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^1 equals 20 patients in Sample Calculation.
    c. If Patient Documented as Tobacco User AND Received Tobacco Cessation Intervention if identified as a Tobacco User equals No, proceed to check Currently a Tobacco Non-User.
7. Check Currently a Tobacco Non-User:
    a. If Currently a Tobacco Non-User equals Yes, include in Data Completeness Met and Performance Met.
    b. Data Completeness Met and Performance Met letter is represented as Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^2 equals 20 patients in the Sample Calculation.
    c. If Currently a Tobacco Non-User equals No, proceed to check Tobacco Assessment or Tobacco Cessation Intervention Not Performed, Reason Not Given.
8. Check Tobacco Assessment or Tobacco Cessation Intervention Not Performed, Reason Not Given:

a. If Tobacco Assessment or Tobacco Cessation Intervention Not Performed, Reason Not Given equals Yes, include in the Data Completeness Met and Performance Not Met.

b. Data Completeness Met and Performance Not Met letter is represented as Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 30 patients in the Sample Calculation.

c. If Tobacco Assessment or Tobacco Cessation Intervention Not Performed, Reason Not Given equals No, proceed to check Data Completeness Not Met.

9. Check Data Completeness Not Met:

a. If Data Completeness Not Met, the Quality Data Code or equivalent was not submitted. 10 patients have been subtracted from Data Completeness Numerator in the Sample Calculation.

SAMPLE CALCULATIONS:

Data Completeness=

Performance Met (a^1+a^2=40 patients) + Performance Not Met (c=30 patients) = 70 patients = **87.50%**
Eligible Population / Denominator (d=80 patients) = 80 patients

Performance Rate=

Performance Met (a^1+a^2=40 patients) = 40 patients = **57.14%**
Data Completeness Numerator (70 patients) = 70 patients

Quality ID #226 (NQF 0028): Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention
– National Quality Strategy Domain: Community/Population Health
– Meaningful Measure Area: Prevention and Treatment of Opiod and Substance Use Disorders

2019 COLLECTION TYPE:
MIPS CLINICAL QUALITY MEASURES (CQMS)

MEASURE TYPE:
Process

DESCRIPTION:
Percentage of patients aged 18 years and older who were screened for tobacco use one or more times within 24 months **AND** who received tobacco cessation intervention if identified as a tobacco user

INSTRUCTIONS:
This measure is to be submitted a minimum of **once per performance period** for patients seen during the performance period. This measure is intended to reflect the quality of services provided for preventive screening for tobacco use. For the purposes of the measure, the most recent denominator eligible encounter should be used to determine if the numerator action for each of the submission criteria was performed within the 24 month look back period from the date of the most recent denominator eligible encounter. It is anticipated that Merit-based Incentive Payment System (MIPS) eligible clinicians who perform the quality actions described in the measure based on the services provided will submit this measure.

This measure will be calculated with 3 performance rates:

1) Percentage of patients aged 18 years and older who were screened for tobacco use one or more times within 24 months
2) Percentage of patients aged 18 years and older who were screened for tobacco use and identified as a tobacco user who received tobacco cessation intervention
3) Percentage of patients aged 18 years and older who were screened for tobacco use one or more times within 24 months AND who received tobacco cessation intervention if identified as a tobacco user

Measure Submission Type:
Measure data may be submitted by individual MIPS eligible clinicians, groups, or third party intermediaries. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure. The quality-data codes listed do not need to be submitted by MIPS eligible clinicians, groups, or third party intermediaries that utilize this modality for submissions; however, these codes may be submitted for those third party intermediaries that utilize Medicare Part B claims data. For more information regarding Application Programming Interface (API), please refer to the Quality Payment Program (QPP) website.

THERE ARE THREE SUBMISSION CRITERIA FOR THIS MEASURE:

1) All patients who were screened for tobacco use

AND

2) All patients who were identified as a tobacco user and who received tobacco cessation intervention

AND

3) All patients who were screened for tobacco use and, if identified as a tobacco user received tobacco cessation intervention, or identified as a tobacco non-user

This measure contains three submission criteria which aim to identify patients who were screened for tobacco use (submission criteria 1), patients who were identified as tobacco users and who received tobacco cessation intervention (submission criteria 2), and a comprehensive look at the overall performance on tobacco screening and cessation intervention (submission criteria 3). By separating this measure into various submission criteria, the MIPS eligible professional or MIPS eligible clinician will be able to better ascertain where gaps in performance exist, and identify opportunities for improvement. The overall rate (submission criteria 3) can be utilized to compare performance to prior published versions of this measure.

SUBMISSION CRITERIA 1: ALL PATIENTS WHO WERE SCREENED FOR TOBACCO USE

DENOMINATOR (SUBMISSION CRITERIA 1):
All patients aged 18 years and older seen for at least two visits or at least one preventive visit during the measurement period

DENOMINATOR NOTE: **Signifies that this CPT Category I code is a non-covered service under the Medicare Part B Physician Fee Schedule (PFS). These non-covered services should be counted in the denominator population for MIPS CQMs.*

Denominator Criteria (Eligible Cases):
Patients aged ≥ 18 years
AND
At least two patient encounters during the performance period (CPT): 90791, 90792, 90832, 90834, 90837, 90845, 92002, 92004, 92012, 92014, 92521, 92522, 92523, 92524, 92540, 92557, 92625, 96150, 96151, 96152, 97165, 97166, 97167, 97168, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350
WITHOUT
Telehealth Modifier: GQ, GT, 95, POS 02
OR
At least one preventive encounter during the performance period (CPT or HCPCS): 99385*, 99386*, 99387*, 99395*, 99396*, 99397*, 99401*, 99402*, 99403*, 99404*, 99411*, 99412*, 99429*, G0438, G0439
WITHOUT
Telehealth Modifier: GQ, GT, 95, POS 02

NUMERATOR (SUBMISSION CRITERIA 1):
Patients who were screened for tobacco use at least once within 24 months

Definitions:
Tobacco Use – Includes any type of tobacco.

NUMERATOR NOTE: *In the event that a patient is screened for tobacco use and tobacco status is unknown, submit G9905. Denominator Exception(s) are determined on the date of the most recent denominator eligible encounter for all submission criteria.*

Numerator Options:

Performance Met:	Patient screened for tobacco use AND identified as a tobacco user **(G9902)**
OR	
Performance Met:	Patient screened for tobacco use AND identified as a tobacco non-user **(G9903)**

OR

Denominator Exception: Documentation of medical reason(s) for not screening for tobacco use (e.g., limited life expectancy, other medical reason) **(G9904)**

OR

Performance Not Met: Patient not screened for tobacco use, reason not given **(G9905)**

SUBMISSION CRITERIA 2: ALL PATIENTS WHO WERE IDENTIFIED AS A TOBACCO USER AND WHO RECEIVED TOBACCO CESSATION INTERVENTION

DENOMINATOR (SUBMISSION CRITERIA 2):
All patients aged 18 years and older seen for at least two visits or at least one preventive visit during the measurement period who were screened for tobacco use and identified as a tobacco user

DENOMINATOR NOTE: **Signifies that this CPT Category I code is a non-covered service under the Medicare Part B Physician Fee Schedule (PFS). These non-covered services should be counted in the denominator population for MIPS CQMs.*

Denominator Criteria (Eligible Cases):
Patients aged ≥ 18 years
AND
All eligible instances when **G9902** is submitted for Performance Met (patient screened for tobacco use and identified as a tobacco user) in the numerator of Submission Criteria 1
AND
At least two patient encounters during the performance period (CPT): 90791, 90792, 90832, 90834, 90837, 90845, 92002, 92004, 92012, 92014, 92521, 92522, 92523, 92524, 92540, 92557, 92625, 96150, 96151, 96152, 97165, 97166, 97167, 97168, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350
WITHOUT
Telehealth Modifier: GQ, GT, 95, POS 02
OR
At least one preventive encounter during the performance period (CPT or HCPCS): 99385*, 99386*, 99387*, 99395*, 99396*, 99397*, 99401*, 99402*, 99403*, 99404*, 99411*, 99412*, 99429*, G0438, G0439
WITHOUT
Telehealth Modifier: GQ, GT, 95, POS 02

NUMERATOR (SUBMISSION CRITERIA 2):
Patients who received tobacco cessation intervention

Definitions:
Tobacco Cessation Intervention Includes brief counseling (3 minutes or less), and/or pharmacotherapy. Note: For the purpose of this measure, brief counseling (e.g., minimal and intensive advice/counseling interventions conducted both in person and over the phone) qualifies for the numerator. Written self-help materials (e.g., brochures, pamphlets) and complementary/alternative therapies do not qualify for the numerator.

NUMERATOR NOTE: *This measure defines tobacco cessation counseling as lasting 3 minutes or less. Services typically provided under CPT codes 99406 and 99407 satisfy the requirement of tobacco cessation intervention, as these services provide tobacco cessation counseling for 3-10 minutes. If a patient received these types of services, submit G-code G9906. Denominator Exception(s) are determined on the date of the most recent denominator eligible encounter for all submission criteria.*

Numerator Options:

Performance Met: Patient identified as a tobacco user received tobacco cessation intervention (counseling and/or pharmacotherapy) **(G9906)**

OR

Denominator Exception: Documentation of medical reason(s) for not providing tobacco cessation intervention (e.g., limited life expectancy, other medical reason) **(G9907)**

OR

Performance Not Met: Patient identified as tobacco user did not receive tobacco cessation intervention (counseling and/or pharmacotherapy), reason not given (**G9908)**

SUBMISSION CRITERIA 3: ALL PATIENTS WHO WERE SCREENED FOR TOBACCO USE AND, IF IDENTIFIED AS A TOBACCO USER RECEIVED TOBACCO CESSATION INTERVENTION, OR IDENTIFIED AS A TOBACCO NON-USER

DENOMINATOR (SUBMISSION CRITERIA 3):

All patients aged 18 years and older seen for at least two visits or at least one preventive visit during the measurement period

DENOMINATOR NOTE: **Signifies that this CPT Category I code is a non-covered service under the Medicare Part B Physician Fee Schedule (PFS). These non-covered services should be counted in the denominator population for MIPS CQMs.*

Denominator Criteria (Eligible Cases):

Patients aged ≥ 18 years

AND

At least two patient encounters during the performance period (CPT): 90791, 90792, 90832, 90834, 90837, 90845, 92002, 92004, 92012, 92014, 92521, 92522, 92523, 92524, 92540, 92557, 92625, 96150, 96151, 96152, 97165, 97166, 97167, 97168, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350

WITHOUT

Telehealth Modifier: GQ, GT, 95, POS 02

OR

At least one preventive encounter during the performance period (CPT or HCPCS): 99385*, 99386*, 99387*, 99395*, 99396*, 99397*, 99401*, 99402*, 99403*, 99404*, 99411*, 99412*, 99429*, G0438, G0439

WITHOUT

Telehealth Modifier: GQ, GT, 95, POS 02

NUMERATOR (SUBMISSION CRITERIA 3):

Patients who were screened for tobacco use at least once within 24 months **AND** who received tobacco cessation intervention if identified as a tobacco user

Definitions:

Tobacco Use – Includes any type of tobacco.

Tobacco Cessation Intervention – Includes brief counseling (3 minutes or less), and/or pharmacotherapy. Note: For the purpose of this measure, brief counseling (e.g., minimal and intensive advice/counseling interventions conducted both in person and over the phone) qualifies for the numerator. Written self-help materials (e.g., brochures, pamphlets) and complementary/alternative therapies do not qualify for the numerator.

NUMERATOR NOTE: *In the event that a patient is screened for tobacco use and identified as a user but did not receive tobacco cessation intervention or if tobacco status is unknown, submit 4004F with 8P. This measure defines tobacco cessation counseling as lasting 3 minutes or less. Services typically provided under CPT codes 99406 and 99407 satisfy the requirement of tobacco cessation intervention, as these services provide tobacco cessation counseling for 3-10 minutes. If a patient received these types of services, submit CPT II 4004F. Denominator Exception(s) are determined on the date of the most recent denominator eligible encounter for all submission criteria.*

Numerator Options:

Performance Met:	Patient screened for tobacco use AND received tobacco cessation intervention (counseling, pharmacotherapy, or both), if identified as a tobacco user **(4004F)**
OR	
Performance Met:	Current tobacco non-user **(1036F)**
OR	
Denominator Exception:	Documentation of medical reason(s) for not screening for tobacco use (e.g., limited life expectancy, other medical reason) **(4004F *with* 1P)**
OR	
Denominator Exception:	Documentation of medical reason(s) for not providing tobacco cessation intervention if identified as a tobacco user (e.g., limited life expectancy, other medical reason) **(G9909)**
OR	
Performance Not Met:	Tobacco screening not performed OR tobacco cessation intervention not provided, reason not otherwise specified **(4004F *with* 8P)**

RATIONALE:

This measure is intended to promote adult tobacco screening and tobacco cessation interventions for those who use tobacco products. There is good evidence that tobacco screening and brief cessation intervention (including counseling and/or pharmacotherapy) is successful in helping tobacco users quit. Tobacco users who are able to stop using tobacco lower their risk for heart disease, lung disease, and stroke.

CLINICAL RECOMMENDATION STATEMENTS:

The USPSTF recommends that clinicians ask all adults about tobacco use, advise them to stop using tobacco, and provide behavioral interventions and U.S. Food and Drug Administration (FDA) – approved pharmacotherapy for cessation to adults who use tobacco. (Grade A Recommendation) (U.S. Preventive Services Task Force, 2015)

The USPSTF recommends that clinicians ask all pregnant women about tobacco use, advise them to stop using tobacco, and provide behavioral interventions for cessation to pregnant women who use tobacco. (Grade A Recommendation) (U.S. Preventive Services Task Force, 2015)

The USPSTF concludes that the current evidence is insufficient to recommend electronic nicotine delivery systems for tobacco cessation in adults, including pregnant women. The USPSTF recommends that clinicians direct patients who smoke tobacco to other cessation interventions with established effectiveness and safety (previously stated). (Grade I Statement) (U.S. Preventive Services Task Force, 2015)

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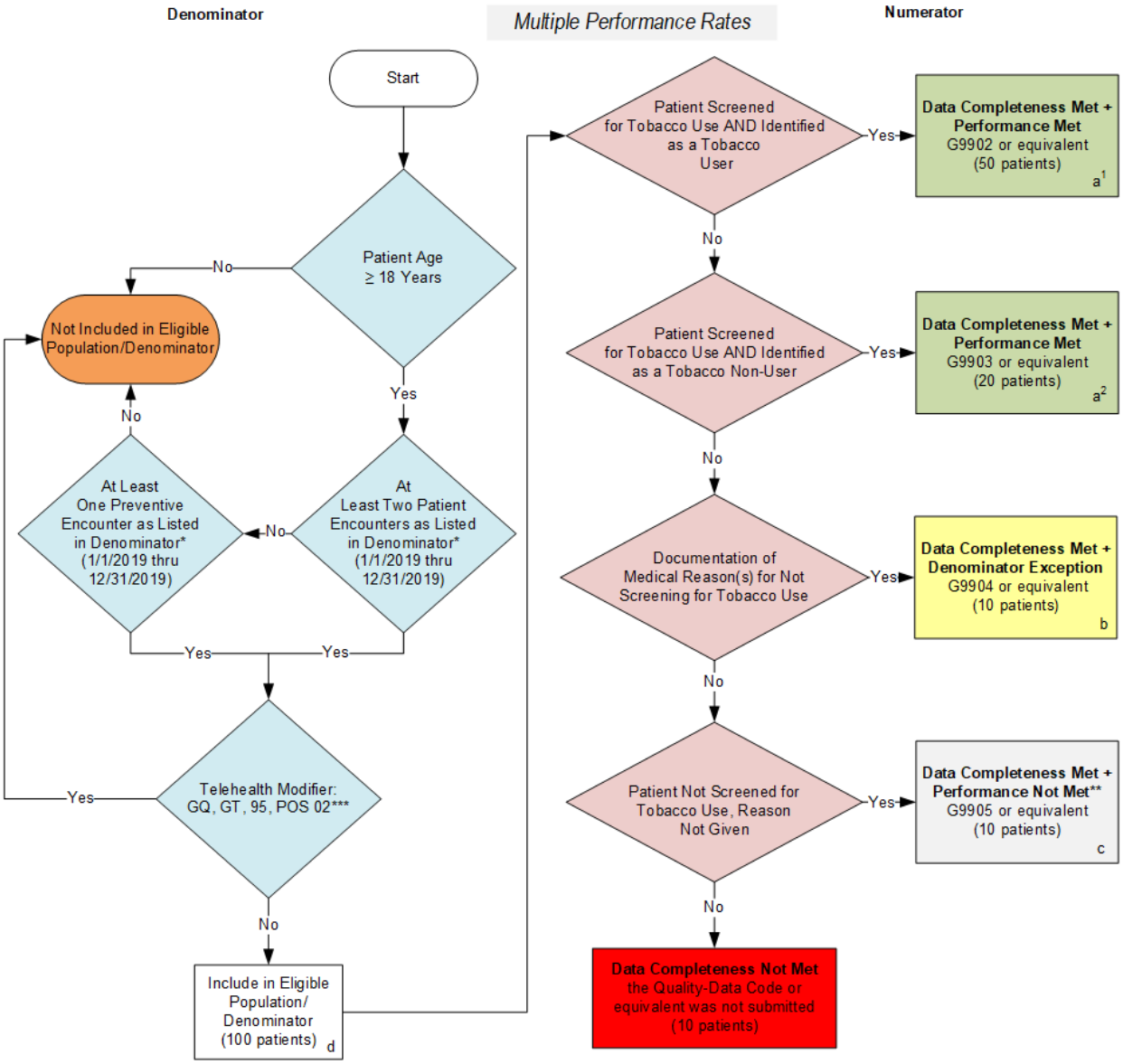
2019 Clinical Quality Measure for Quality ID #226 NQF #0028: Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention
Submission Criteria One



SAMPLE CALCULATIONS SUBMISSION CRITERIA ONE:

Data Completeness=

Performance Met (a^1+a^2=70 patients) + Denominator Exception (b=10 patients) + Performance Not Met (c=10 patients) = 90 patients = **90.00%**

Eligible Population / Denominator (d=100 patients) = 100 patients

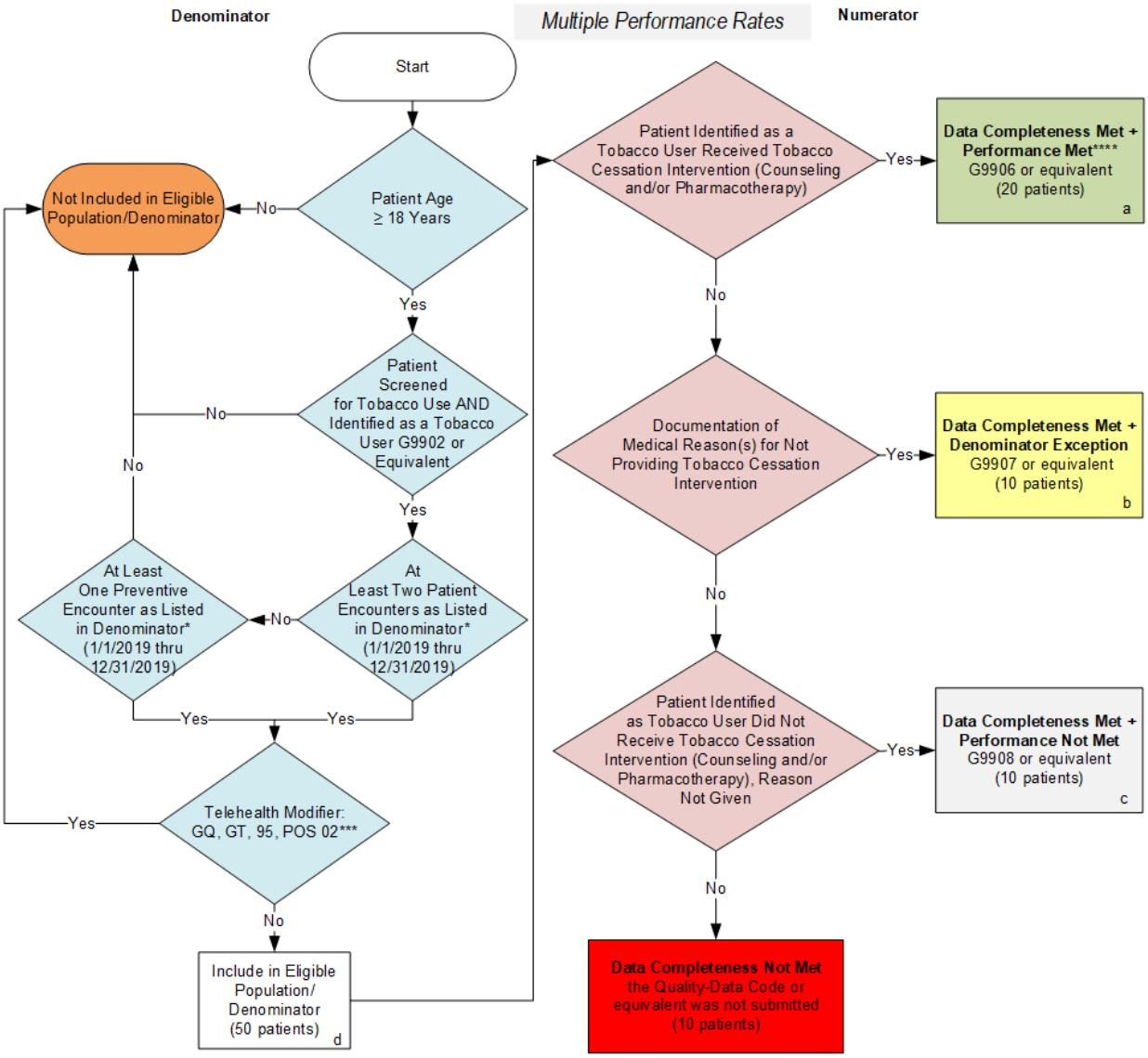
Performance Rate=

Performance Met (a^1+a^2=70 patients) = 70 patients = **87.50%**

Data Completeness Numerator (90 patients) – Denominator Exception (b=10 patients) = 80 patients

*See the posted Measure Specification for specific coding and instructions to submit this measure.
**In the event that the tobacco status is unknown submit G9905.
***All encounters should be without the telehealth modifier in order to be denominator eligible.
NOTE: Submission Frequency: Patient-process

2019 Clinical Quality Measure Flow for Quality ID #226 NQF #0028: Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention Submission Criteria Two



SAMPLE CALCULATIONS SUBMISSION CRITERIA TWO:

Data Completeness=

Performance Met (a=20 patients) + Denominator Exception (b=10 patients) + Performance Not Met (c=10 patients) = 40 patients = **80.00%**

Eligible Population / Denominator (d=50 patients) = 50 patients

Performance Rate=

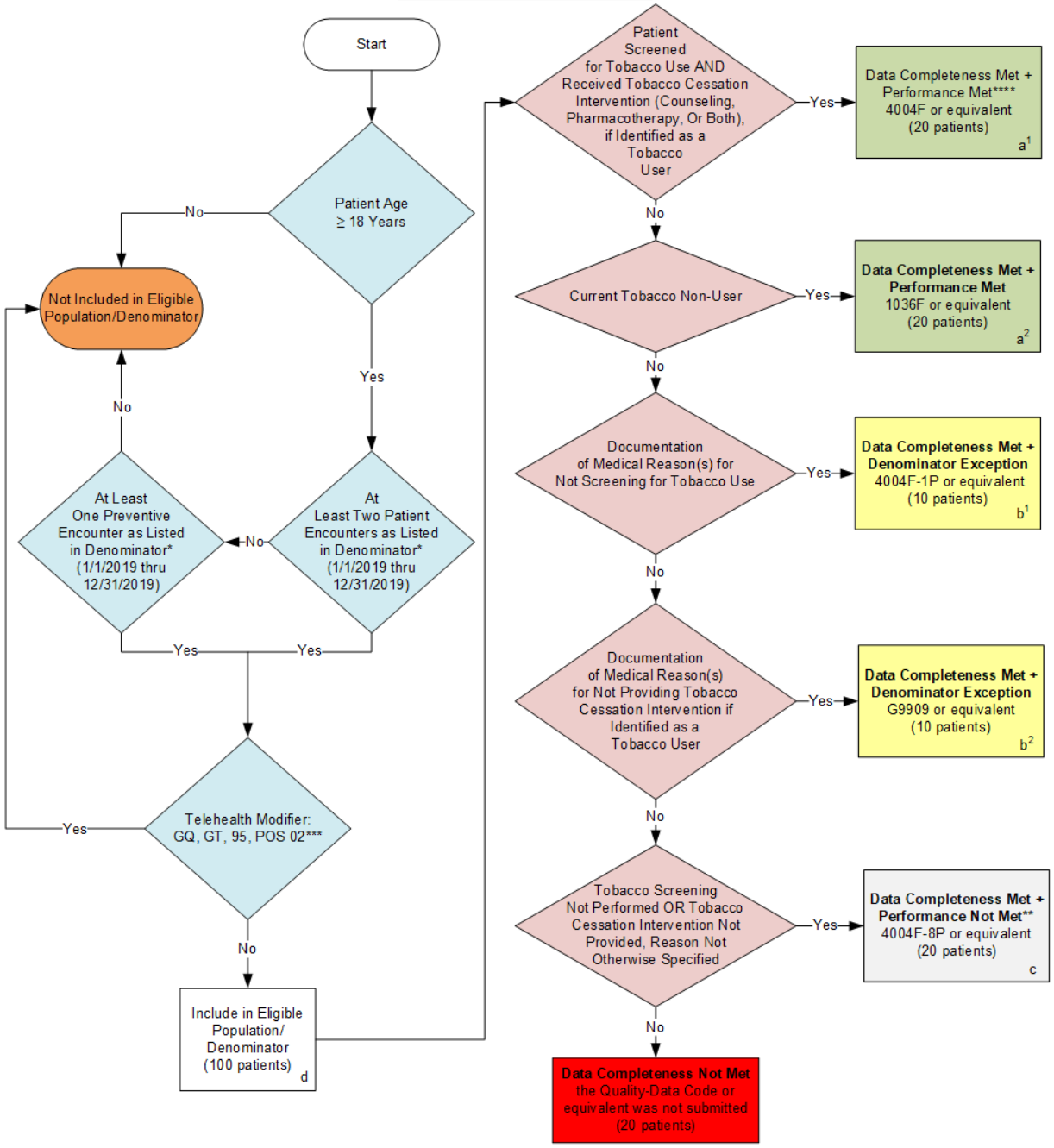
Performance Met (a=20 patients) = 20 patients = **66.67%**

Data Completeness Numerator (40 patients) – Denominator Exception (b=10 patients) = 30 patients

*See the posted Measure Specification for specific coding and instructions to submit this measure.
***All encounters should be without the telehealth modifier in order to be denominator eligible.
****This measure defines tobacco cessation counseling as lasting 3 minutes or less. Services typically provided under CPT codes 99406 and 99407 satisfy the requirement of tobacco cessation intervention, as these services provide tobacco cessation counseling for 3-10 minutes. If a patient received these types of services, report submit G-code G9906.
NOTE: Submission Frequency: Patient-process

2019 Clinical Quality Measure Flow for Quality ID #226 NQF #0028: Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention Submission Criteria Three

Denominator | *Multiple Performance Rates* | **Numerator**



*See the posted Measure Specification for specific coding and instructions to submit this measure.
***All encounters should be without the telehealth modifier in order to be denominator eligible.
****This measure defines tobacco cessation counseling as lasting 3 minutes or less. Services typically provided under CPT codes 99406 and 99407 satisfy the requirement of tobacco cessation intervention, as these services provide tobacco cessation counseling for 3-10 minutes. If a patient received these types of services, report submit G-code G9906.
NOTE: Submission Frequency: Patient-process

2019 Clinical Quality Measure Flow for Quality ID #226 NQF #0028: Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention Submission Criteria Three

Multiple Performance Rates

SAMPLE CALCULATIONS SUBMISSION CRITERIA THREE:

Data Completeness=

Performance Met (a^1+a^2=40 patients) + Denominator Exception (b^1+b^2=20 patients) + Performance Not Met (c=20 patients) = 80 patients = **80.00%**

Eligible Population / Denominator (d=100 patients) = 100 patients

Performance Rate=

Performance Met (a^1+a^2=40 patients) = 40 patients = **66.67%**

Data Completeness Numerator (80 patients) – Denominator Exception (b^1+b^2=20 patients) = 60 patients

*See the posted Measure Specification for specific coding and instructions to submit this measure.
**In the event that a patient is identified as a user but did not receive tobacco cessation intervention submit 4004F-8P.
***All encounters should be without the telehealth modifier in order to be denominator eligible.
****This measure defines tobacco cessation counseling as lasting 3 minutes or less. Services typically provided under CPT codes 99406 and 99407 satisfy the requirement of tobacco cessation intervention, as these services provide tobacco cessation counseling for 3-10 minutes. If a patient received these types of services, submit 4004F.
NOTE: Submission Frequency: Patient-process

2019 Clinical Quality Measure Flow for Quality ID #226 NQF #0028: Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention

This Measure Has Three Submission Criteria. All Performance Rates Must Be Submitted if Patient Is Identified as a Tobacco User. If Patient is Identified as a Tobacco Non-User, only Performance Rates for Submission Criteria One and Three Must Be Submitted.

Multiple Performance Rates

Submission Criteria #1 All Patients Who Were Screened for Tobacco Use

SAMPLE CALCULATIONS SUBMISSION CRITERIA ONE:

Data Completeness=

Performance Met (a^1+a^2=70 patients) + Denominator Exception (b=10 patients) + Performance Not Met (c=10 patients) = 90 patients = **90.00%**

Eligible Population / Denominator (d=100 patients) = 100 patients

Performance Rate=

Performance Met (a^1+a^2=70 patients) = 70 patients = **87.50%**

Data Completeness Numerator (90 patients) – Denominator Exception (b=10 patients) = 80 patients

Submission Criteria #2 All Patients Who Were Identified as a Tobacco User Who Received Tobacco Cessation Intervention

SAMPLE CALCULATIONS SUBMISSION CRITERIA TWO:

Data Completeness=

Performance Met (a=20 patients) + Denominator Exception (b=10 patients) + Performance Not Met (c=10 patients) = 40 patients = **80.00%**

Eligible Population / Denominator (d=50 patients) = 50 patients

Performance Rate=

Performance Met (a=20 patients) = 20 patients = **66.67%**

Data Completeness Numerator (40 patients) – Denominator Exception (b=10 patients) = 30 patients

Submission Criteria #3 Patients Screened for Tobacco Use AND Who Received Tobacco Cessation Intervention if Identified as a Tobacco User

SAMPLE CALCULATIONS SUBMISSION CRITERIA THREE:

Data Completeness=

Performance Met (a^1+a^2=40 patients) + Denominator Exception (b^1+b^2=20 patients) + Performance Not Met (c=20 patients) = 80 patients = **80.00%**

Eligible Population / Denominator (d=100 patients) = 100 patients

Performance Rate=

Performance Met (a^1+a^2=40 patients) = 40 patients = **66.67%**

Data Completeness Numerator (80 patients) – Denominator Exception (b^1+b^2=20 patients) = 60 patients

2019 Clinical Quality Measure Flow Narrative for Quality ID #226 NQF #0028: Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specification.

Submission Criteria #1

1. Start with Denominator
2. Check Patient Age:
    a. If Patient Age is greater than or equal to 18 Years equals No during the measurement period, do not include in Eligible Population. Stop Processing.
    b. If Patient Age is greater than or equal to 18 Years equals Yes during the measurement period, proceed to check At Least Two Patient Encounters.
3. Check At Least Two Patient Encounters:
    a. If At Least Two Patient Encounters as Listed in the Denominator equals No, proceed to check At Least One Preventive Encounter.
    b. If At Least Two Patient Encounters as Listed in the Denominator equals Yes, proceed to check Telehealth Modifier.
4. Check Telehealth Modifier:
    a. If Telehealth Modifier equals Yes, proceed to check At Least One Preventive Encounter.
    b. If Telehealth Modifier equals No, include in Eligible Population.
5. Check At Least One Preventive Encounter:
    a. If At Least One Preventive Encounter as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.
    b. If At Least One Preventive Encounter as Listed in the Denominator equals Yes, proceed to check Telehealth Modifier.
6. Check Telehealth Modifier:
    a. If Telehealth Modifier equals Yes, do not include in Eligible Population. Stop Processing.
    b. If Telehealth Modifier equals No, include in Eligible Population.
7. Denominator Population:
    a. Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 100 patients in the Sample Calculation.
8. Start Numerator
9. Check Patient Screened for Tobacco Use AND Identified as a Tobacco User:

a. If Patient Screened for Tobacco Use AND Identified as a Tobacco User equals Yes, include in Data Completeness Met and Performance Met.

b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^1 equals 50 patients in the Sample Calculation.

c. If Patient Screened for Tobacco Use AND Identified as a Tobacco User equals No, proceed to check Patient Screened for Tobacco Use AND Identified as a Tobacco Non-User.

10. Check Patient Screened for Tobacco Use AND Identified as a Tobacco Non-User:

    a. If Patient Screened for Tobacco Use AND Identified as a Tobacco Non-User equals Yes, include in Data Completeness Met and Performance Met.

    b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^2 equals 20 patients in the Sample Calculation.

    c. If Patient Screened for Tobacco Use AND Identified as a Tobacco Non-User equals No, proceed to check Documentation of Medical Reason(s) for Not Screening for Tobacco Use.

11. Check Documentation of Medical Reason(s) for Not Screening for Tobacco Use:

    a. If Documentation of Medical Reason(s) for Not Screening for Tobacco Use equals Yes, include in Data Completeness Met and Denominator Exception.

    b. Data Completeness Met and Denominator Exception letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter b equals 10 patients in the Sample Calculation.

    c. If Documentation of Medical Reason(s) for Not Screening for Tobacco Use equals No, proceed to check Patient Not Screened for Tobacco Use, Reason Not Given.

12. Check Patient Not Screened for Tobacco Use, Reason Not Given:

    a. If Patient Not Screened for Tobacco Use, Reason Not Given equals Yes, include in the Data Completeness Met and Performance Not Met.

    b. Data Completeness Met and Performance Not Met letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 10 patients in the Sample Calculation.

    c. If Patient Not Screened for Tobacco Use, Reason Not Given equals No, proceed to check Data Completeness Not Met.

13. Check Data Completeness Not Met:

    a. If Data Completeness Not Met, the Quality Data Code or equivalent was not submitted. 10 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

SAMPLE CALCULATIONS SUBMISSION CRITERIA ONE:

Data Completeness=

$$\frac{\text{Performance Met } (a^1+a^2=70 \text{ patients}) + \text{Denominator Exception } (b=10 \text{ patients}) + \text{Performance Not Met } (c=10 \text{ patients})}{\text{Eligible Population / Denominator } (d=100 \text{ patients})} = \frac{90 \text{ patients}}{100 \text{ patients}} = \mathbf{90.00\%}$$

Performance Rate=

$$\frac{\text{Performance Met } (a^1+a^2=70 \text{ patients})}{\text{Data Completeness Numerator } (90 \text{ patients}) - \text{Denominator Exception } (b=10 \text{ patients})} = \frac{70 \text{ patients}}{80 \text{ patients}} = \mathbf{87.50\%}$$

2019 Clinical Quality Measure Flow Narrative for Quality ID #226 NQF #0028:

Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specification.

Submission Criteria #2

1. Start with Denominator
2. Check Patient Age:
    a. If Patient Age is greater than or equal to 18 Years equals No during the measurement period do not include in Eligible Population. Stop Processing.
    b. If Patient Age is greater than or equal to 18 Years equals Yes during the measurement period, proceed to check Patient Screened for Tobacco Use AND Identified as a Tobacco User.
3. Check Patient Screened For Tobacco Use AND Identified as a Tobacco User:
    a. If Patient Screened For Tobacco Use AND Identified as a Tobacco User equals Yes, proceed to check At Least Two Patient Encounters.
    b. If Patient Screened For Tobacco Use AND Identified as a Tobacco User equals No, do not include in Eligible Population. Stop Processing
4. Check At Least Two Patient Encounters:
    a. If At Least Two Patient Encounters as Listed in the Denominator equals No, proceed to check At Least One Preventive Encounter.
    b. If At Least Two Patient Encounters as Listed in the Denominator equals Yes, proceed to check Telehealth Modifier.
5. Check Telehealth Modifier:
    a. If Telehealth Modifier equals Yes, proceed to check At Least One Preventive Encounter.
    b. If Telehealth Modifier equals No, include in Eligible Population.
6. Check At Least One Preventive Encounter:
    a. If At Least One Preventive Encounter as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.
    b. If At Least One Preventive Encounter as Listed in the Denominator equals Yes, proceed to check Telehealth Modifier.
7. Check Telehealth Modifier:
    a. If Telehealth Modifier equals Yes, do not include in Eligible Population. Stop Processing.
    b. If Telehealth Modifier equals No, include in Eligible Population.
8. Denominator Population:

a. Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 50 patients in the Sample Calculation.

9. Start Numerator

10. Check Patient Identified as a Tobacco User Received Tobacco Cessation Intervention (Counseling and/or Pharmacotherapy):

    a. If Patient Identified as a Tobacco User Received Tobacco Cessation Intervention (Counseling and/or Pharmacotherapy) equals Yes, include in Data Completeness Met and Performance Met.

    b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a equals 20 patients in the Sample Calculation.

    c. If Patient Identified as a Tobacco User Received Tobacco Cessation Intervention (Counseling and/or Pharmacotherapy) equals No, proceed to check Documentation of Medical Reason(s) for Not Providing Tobacco Cessation Intervention.

11. Check Documentation of Medical Reason(s) for Not Providing Tobacco Cessation Intervention:

    a. If Documentation of Medical Reason(s) for Not Providing Tobacco Cessation Intervention equals Yes, include in Data Completeness Met and Denominator Exception.

    b. Data Completeness Met and Denominator Exception letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter b equals 10 patients in the Sample Calculation.

    c. If Documentation of Medical Reason(s) for Not Providing Tobacco Cessation Intervention equals No, proceed to check Patient Identified as Tobacco User Did Not Receive Tobacco Cessation Intervention (Counseling and/or Pharmacotherapy), Reason Not Given.

12. Check Patient Identified as Tobacco User Did Not Receive Tobacco Cessation Intervention (Counseling and/or Pharmacotherapy), Reason Not Given:

    a. If Patient Identified as Tobacco User Did Not Receive Tobacco Cessation Intervention (Counseling and/or Pharmacotherapy), Reason Not Given equals Yes, include in the Data Completeness Met and Performance Not Met.

    b. Data Completeness Met and Performance Not Met letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 10 patients in the Sample Calculation.

    c. If Patient Identified as Tobacco User Did Not Receive Tobacco Cessation Intervention (Counseling and/or Pharmacotherapy), Reason Not Given equals No, proceed to check Data Completeness Not Met.

13. Check Data Completeness Not Met:

    a. If Data Completeness Not Met, the Quality Data Code or equivalent was not submitted. 10 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

SAMPLE CALCULATIONS SUBMISSION CRITERIA TWO:

Data Completeness=

$$\frac{\text{Performance Met (a=20 patients) + Denominator Exception (b=10 patients) + Performance Not Met (c=10 patients)}}{\text{Eligible Population / Denominator (d=50 patients)}} = \frac{40 \text{ patients}}{50 \text{ patients}} = \mathbf{80.00\%}$$

Performance Rate=

$$\frac{\text{Performance Met (a=20 patients)}}{\text{Data Completeness Numerator (40 patients) – Denominator Exception (b=10 patients)}} = \frac{20 \text{ patients}}{30 \text{ patients}} = \mathbf{66.67\%}$$

2019 Clinical Quality Measure Flow Narrative for Quality ID #226 NQF #0028:

Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention

Please refer to the specific section of the specification to identify the denominator and numerator information for use in submitting this Individual Specification.

Submission Criteria #3

1. Start with Denominator
2. Check Patient Age:
    a. If Patient Age is greater than or equal to 18 Years equals No during the measurement period, do not include in Eligible Population. Stop Processing.
    b. If Patient Age is greater than or equal to 18 Years equals Yes during the measurement period, proceed to check At Least Two Patient Encounters.
3. Check At Least Two Patient Encounters:
    a. If At Least Two Patient Encounters as Listed in the Denominator equals No, proceed to check At Least One Preventive Encounter.
    b. If At Least Two Patient Encounters as Listed in the Denominator equals Yes, proceed to check Telehealth Modifier.
4. Check Telehealth Modifier:
    a. If Telehealth Modifier equals Yes, proceed to check At Least One Preventive Encounter.
    b. If Telehealth Modifier equals No, include in Eligible Population.
5. Check At Least One Preventive Encounter:
    a. If At Least One Preventive Encounter as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.
    b. If At Least One Preventive Encounter as Listed in the Denominator equals Yes, proceed to check Telehealth Modifier.
6. Check Telehealth Modifier:
    a. If Telehealth Modifier equals Yes, do not include in Eligible Population. Stop Processing.
    b. If Telehealth Modifier equals No, include in Eligible Population.
7. Denominator Population:
    a. Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 100 patients in the Sample Calculation.
8. Start Numerator

9. Check Patient Screened for Tobacco Use AND Received Tobacco Cessation Intervention (Counseling, Pharmacotherapy, Or Both), if Identified as a Tobacco User:

    a. If Patient Screened for Tobacco Use AND Received Tobacco Cessation Intervention (Counseling, Pharmacotherapy, Or Both), if Identified as a Tobacco User equals Yes, include in Data Completeness Met and Performance Met.

    b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^1 equals 20 patients in the Sample Calculation.

    c. If Patient Screened for Tobacco Use AND Received Tobacco Cessation Intervention (Counseling, Pharmacotherapy, Or Both), if Identified as a Tobacco User equals No, proceed to check Current Tobacco Non-User.

10. Check Current Tobacco Non-User:

    a. If Current Tobacco Non-User equals Yes, include in Data Completeness Met and Performance Met.

    b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^2 equals 20 patients in the Sample Calculation.

    c. If Current Tobacco Non-User equals No, proceed to check Documentation of Medical Reason(s) for Not Screening for Tobacco Use.

11. Check Documentation of Medical Reason(s) for Not Screening for Tobacco Use:

    a. If Documentation of Medical Reason(s) for Not Screening for Tobacco Use equals Yes, include in Data Completeness Met and Denominator Exception.

    b. Data Completeness Met and Denominator Exception letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter b^1 equals 10 patients in the Sample Calculation.

    c. If Documentation of Medical Reason(s) for Not Screening for Tobacco Use equals No, proceed to check Documentation of Medical Reason(s) for Not Providing Tobacco Cessation Intervention if Identified as a Tobacco User.

12. Check Documentation of Medical Reason(s) for Not Providing Tobacco Cessation Intervention if Identified as a Tobacco User:

    a. If Documentation of Medical Reason(s) for Not Providing Tobacco Cessation Intervention if Identified as a Tobacco User equals Yes, include in Data Completeness Met and Denominator Exception.

    b. Data Completeness Met and Denominator Exception letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter b^2 equals 10 patients in the Sample Calculation.

    c. If Documentation of Medical Reason(s) for Not Providing Tobacco Cessation Intervention if Identified as a Tobacco User equals No, proceed to check Tobacco Screening Not Performed OR Tobacco Cessation Intervention Not Provided, Reason Not Otherwise Specified.

13. Check Tobacco Screening Not Performed OR Tobacco Cessation Intervention Not Provided, Reason Not Otherwise Specified:

    a. If Tobacco Screening Not Performed OR Tobacco Cessation Intervention Not Provided, Reason Not Otherwise Specified equals Yes, include in the Data Completeness Met and Performance Not Met.

    b. Data Completeness Met and Performance Not Met letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 20 patients in the Sample Calculation.

    c. If Tobacco Screening Not Performed OR Tobacco Cessation Intervention Not Provided, Reason Not Otherwise Specified equals No, proceed to check Data Completeness Not Met.

14. Check Data Completeness Not Met:

    a. If Data Completeness Not Met, the Quality Data Code or equivalent was not submitted. 20 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

SAMPLE CALCULATIONS SUBMISSION CRITERIA THREE:

Data Completeness=

$$\frac{\text{Performance Met } (a^1+a^2=40 \text{ patients}) + \text{Denominator Exception } (b^1+b^2=20 \text{ patients}) + \text{Performance Not Met } (c=20 \text{ patients})}{\text{Eligible Population / Denominator } (d=100 \text{ patients})} = \frac{80 \text{ patients}}{100 \text{ patients}} = \mathbf{80.00\%}$$

Performance Rate=

$$\frac{\text{Performance Met } (a^1+a^2=40 \text{ patients})}{\text{Data Completeness Numerator (80 patients)} - \text{Denominator Exception } (b^1+b^2=20 \text{ patients})} = \frac{40 \text{ patients}}{60 \text{ patients}} = \mathbf{66.67\%}$$

Measure:	Preventive Care and Screening: Tobacco Cessation Intervention
Description:	The percentage of active patients 18 years and older and who were screened for tobacco use one or more times within 24 months AND who received cessation counseling if identified as a tobacco user
Age criteria:	Eligible population is determined as 18 at the date of encounter **Example 1:** Patient turns 18 on 4/15/2018 Date of encounter 4/12/2018 Patient is NOT IN denominator **Example 2:** Patient turns 18 on 4/15/2018 Date of encounter 6/12/2018 Patient is IN denominator
Numerator Statement:	All active patients 18 and older at the date of encounter who were screened for tobacco (all forms including smokeless) use at least once within 24 months and were either identified as a non-smoker OR identified as a smoker AND received tobacco cessation intervention
Denominator Statement:	All active patients 18 and older at the date of encounter with at least two visits (see Outpatient Visit criteria) **OR** one preventive visit during the measurement period
Denominator Exclusions:	None
Denominator Exceptions:	Documentation of medical reason(s) for not screening for tobacco use OR for not providing tobacco cessation intervention for patients identified as tobacco users (e.g., limited life expectancy, other medical reason)
Tobacco Use and Intervention Definitions:	Tobacco Use – Includes use of any type of tobacco Tobacco Cessation Intervention – Includes brief counseling (3 minutes or less), and/or pharmacotherapy
E-Cigs	Per measure: "As noted in a recommendation statement from the USPSTF, the current evidence is insufficient to recommend electronic nicotine delivery systems (ENDS) including electronic cigarettes for tobacco cessation. Additionally, ENDS are not currently classified as tobacco in the recent evidence review to support the update of the USPSTF recommendation given that the devices do not burn or use tobacco leaves. In light of the current lack of evidence, the measure does not currently capture e-cigarette usage as either tobacco use or a cessation aid."
Patients Not Assessed:	If tobacco use status of patient is unknown, the patient does not meet the screening component required to be counted in the numerator and should be considered a measure failure.
Look back Period:	There are two different lookback period for this measure: • Documentation of cessation counseling – 24 month look back from most recent office visit

	• Count of encounters – 24 month look back from end of measurement period to determine if patient has been seen twice for any type of visit or for one preventive visit
Source:	NQF 0028 CMS 138v7 population 3 (populations 1 and 2 will not be reported separately as the measure suggests)

Transition Record with Specified Elements Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

NQF Endorsement Status	Endorsement Removed
NQF ID	0649
Measure Type	Process
Measure Content Last Updated	2018-06-08
Last Updated in CMIT	2017-02-05 00:00:00.0

Properties

Description	Percentage of patients, regardless of age, discharged from an inpatient facility (eg, hospital inpatient or observation, skilled nursing facility, or rehabilitation facility) to home or any other site of care, or their caregiver(s), who received a transition record (and with whom a review of all included information was documented) at the time of discharge including, at a minimum, all of the specified elements
Numerator	Patients or their caregiver(s) who received a transition record (and with whom a review of all included information was documented) at the time of discharge including, at a minimum, all of the following elements: Inpatient Care Reason for inpatient admission, AND Major procedures and tests performed during inpatient stay and summary of results, AND Principal diagnosis at discharge Post-Discharge/ Patient Self-Management Current medication list, AND Studies pending at discharge (eg, laboratory, radiological), AND Patient instructions Advance Care Plan Advance directives or surrogate decision maker documented OR

Transition Record with Specified Elements Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

	Documented reason for not providing advance care plan Contact Information/Plan for Follow-up Care 24-hour/7-day contact information including physician for emergencies related to inpatient stay, AND Contact information for obtaining results of studies pending at discharge, AND Plan for follow-up care, AND Primary physician, other health care professional, or site designated for follow-up care
Denominator	All patients, regardless of age, discharged from an inpatient facility (eg, hospital inpatient or observation, skilled nursing facility, or rehabilitation facility) to home/self care or any other site of care.
Denominator Exclusions	Patients who died. Patients who left against medical advice (AMA) or discontinued care
Rationale	This measure is important to decrease cost, address gaps in care, and enhance coordination of communication. Cost * In 2006, there were over 39 million hospital discharges; of those, 13 percent of these patients are repeatedly hospitalized and use 60 percent of the healthcare resources. * A 2007 report by the Medicare Payment Advisory Commission estimated approximately 18 percent of admissions result in readmissions within 30 days, costing CMS $15 billion. Gaps in Care: * Sabogal and colleagues found that uncoordinated transitions between sites of care, even within the same institution, and between caregivers increase hospital readmissions, medical errors, duplication of services, and waste of resources. * Moore and colleagues examined three types of discontinuity of care among older patients transferred from the hospital: medication, test result follow-up, and initiation of a recommended work-up. They found that nearly 50 percent of hospitalized patients experienced at least one discontinuity and that patients who did not have a recommended work-up initiated were six times more likely to be re-hospitalized. * A prospective, cross-sectional study by Roy and colleagues found that approximately 40 percent of patients have pending test results at the time of discharge and that 10 percent of these require some ac Emergency Department Visits * The 2008 National Health Statistics Report determined that

Transition Record with Specified Elements Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

2.3 million (2 percent) emergency department visits are from patients who were discharged from the hospital within the previous 7 days. The report also cited the following: * Ten percent of the 2.3 million emergency department visits were for complications related to their recent hospitalization, and * The uninsured are 3 times more likely to visit the emergency department. Medication errors: * An estimated 60 percent of medication errors occur during times of transition: upon admission, transfer, or discharge of a patient. * During care transitions, patients receive medications from different prescribers who rarely have access to patients' comprehensive medication list. * Forster and colleagues found that 19 percent of discharged patients experienced an associated adverse event within three weeks of leaving the hospital; 66 percent of these were adverse drug events. Coleman EA, Min S, Chomiak A, Kramer AM. 2004. Post-hospital care transitions: patterns, complications, and risk identification. Health Services Research 39:1449-1465. Agency for Healthcare Research and Quality (ARHQ). 1999. Outcomes by Patient and Hospital Characteristics for All Discharges. Available at: http://www.ahrq.gov/HCUPnet.asp. Kramer A, Eilertsen T, Lin M, Hutt E. 2000. Effects of nurse staffing on hospital transfer quality measures for new admissions. Pp. 9.1-9.22. Inappropriateness of Minimum Nurse Staffing Ratios for Nursing Homes. Health Care Financing Administration. Hutt E, Ecord M, Eilertsen TB, et al. Precipitants of emergency room visits and acute hospitalization in short-stay Medicare nursing home residents. J Am Geriatr Soc 2001; 50: 223-229. Jack BW, Chetty VK, Anthony D, et al. A reengineered hospital discharge program to decrease rehospitalization. Ann Intern Med 2009; 150:178-187. Agency for Healthcare Research and Quality (ARHQ). 2006. Outcomes by Patient and Hospital Characteristics for All Discharges. Available at: http://www.ahrq.gov/HCUPnet.asp. Medicare Payment Advisory Commission. A data book: Healthcare spending and the Medicare program. June 2007. Available at: http://www.medpac.gov/documents/Jun07DataBook_Entire_report.pdf. Harris G. Report finds a heavy toll from medication errors, N.Y. Times (July 21, 2006). Available at: http://www.nytimes.com/2006/07/21/health/21drugerrors.html ex=1311134400&en=8f34018d05534d7a&ei=508 8&partner=rssnyt&emc=rss. Sabogal F, Coots-Miyazaki M, Lett JE. Effective care transitions interventions:

Transition Record with Specified Elements Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

Evidence	Not Available

Developer/Steward

Steward	American Medical Association - Physician Consortium for Performance Improvement (AMA-PCPI)
Contact	Not Available
Measure Developer	Not Available
Development Stage	Fully Developed

Characteristics

Measure Type	Process
Meaningful Measure	Transfer of Health Information and Interoperability
Healthcare Priority	Promoting Effective Communication and Coordination of Care
eCQM Spec Available	Not Available
NQF Endorsement Status	Endorsement Removed
NQF ID	0649
Last NQF Update	2017-07-03
Target Population Age	0+
Target Population Age (High)	0
Target Population Age (Low)	0
Reporting Level	Facility
Conditions	Not Available

Transition Record with Specified Elements Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

Subconditions	Not Available
Care Settings	Hospital Outpatient Surgery Department/Ambulatory Surgery Center, Hospital/Acute Care Facility, Inpatient Rehabilitation Facility, Nursing Home

Groups

Core Measure Set	Not Available

Measure Links

Measure Program: Hospital Compare

Data Sources	Administrative Claims, EHR, Paper Medical Records
Purposes	
Quality Domain	Not Available

Measure Program Links

Current Measure Status

Status: Implemented

Effective Date	2017-10-01 00:00:00.0000000

Transition Record with Specified Elements Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

Comments	Not Available
Status Links	https://www.federalregister.gov/articles/2015/08/05/2015-18903/medicare-program-inpatient-psychiatric-facilities-prospective-payment-system-update-for-fiscal-year

Historical Statuses

Status: Finalized

Effective Date	2015-08-05 00:00:00.0000000
Comments	Not Available
Status Links	https://www.federalregister.gov/articles/2015/08/05/2015-18903/medicare-program-inpatient-psychiatric-facilities-prospective-payment-system-update-for-fiscal-year

Status: Proposed

Effective Date	2015-05-01 00:00:00.0000000
Comments	Not Available
Status Links	https://www.federalregister.gov/articles/2015/08/05/2015-18903/medicare-program-inpatient-psychiatric-facilities-prospective-payment-system-update-for-fiscal-year

Status: Reference

Effective Date	1900-01-01 00:00:00.0000000
Comments	Not Available
Status Links	https://www.medicare.gov/hospitalcompare/search.html https://www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/hospitalqualityinits/hospitalcompare.html

Transition Record with Specified Elements Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228773989482

Measure Program: Inpatient Psychiatric Facility Quality Reporting

Data Sources	Administrative Claims, EHR, Paper Medical Records, Electronic Clinical Data
Purposes	
Quality Domain	Not Available

Measure Program Links

Current Measure Status

Status: Finalized

Effective Date	2015-08-05 00:00:00.0000000
Comments	Not Available
Status Links	https://www.federalregister.gov/articles/2015/08/05/2015-18903/medicare-program-inpatient-psychiatric-facilities-prospective-payment-system-update-for-fiscal-year https://www.gpo.gov/fdsys/pkg/FR-2016-08-22/pdf/2016-18476.pdf

Upcoming Status Changes

Status: Implemented

Effective Date	2018-10-01 00:00:00.0000000

Transition Record with Specified Elements Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

Comments	Not Available
Status Links	https://www.federalregister.gov/articles/2015/08/05/2015-18903/medicare-program-inpatient-psychiatric-facilities-prospective-payment-system-update-for-fiscal-year https://www.gpo.gov/fdsys/pkg/FR-2016-08-22/pdf/2016-18476.pdf

Historical Statuses

Status: Proposed

Effective Date	2015-05-01 00:00:00.0000000
Comments	Not Available

Status: Reference

Effective Date	1900-01-01 00:00:00.0000000
Comments	Not Available
Status Links	https://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228773989482 https://www.gpo.gov/fdsys/pkg/FR-2016-08-22/pdf/2016-18476.pdf

Quality ID #431 (NQF 2152): Preventive Care and Screening: Unhealthy Alcohol Use: Screening & Brief Counseling
– National Quality Strategy Domain: Community/Population Health
– Meaningful Measure Area: Prevention and Treatment of Opioid and Substance Use Disorders

2019 COLLECTION TYPE:
MIPS CLINICAL QUALITY MEASURES (CQMS)

MEASURE TYPE:
Process

DESCRIPTION:
Percentage of patients aged 18 years and older who were screened for unhealthy alcohol use using a systematic screening method at least once within the last 24 months AND who received brief counseling if identified as an unhealthy alcohol user

INSTRUCTIONS:
This measure is to be submitted **once per performance period** for patients seen during the performance period. This measure is intended to reflect the quality of services provided for preventive screening for unhealthy alcohol use. There is no diagnosis associated with this measure. This measure may be submitted by Merit-based Incentive Payment System (MIPS) eligible clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding. For the purposes of the measure, the most recent denominator eligible encounter should be used to determine if the numerator action for the submission criteria was performed within the 24-month look back period.

Measure Submission Type:
Measure data may be submitted by individual MIPS eligible clinicians, groups, or third party intermediaries. The listed denominator criteria are used to identify the intended patient population. The numerator options included in this specification are used to submit the quality actions as allowed by the measure. The quality-data codes listed do not need to be submitted by MIPS eligible clinicians, groups, or third party intermediaries that utilize this modality for submissions; however, these codes may be submitted for those third party intermediaries that utilize Medicare Part B claims data. For more information regarding Application Programming Interface (API), please refer to the Quality Payment Program (QPP) website.

DENOMINATOR:
All patients aged 18 years and older seen for at least two visits or at least one preventive visit during the measurement period

> ***DENOMINATOR NOTE:*** **Signifies that this CPT Category I code is a non-covered service under the Medicare Part B Physician Fee Schedule (PFS). These non-covered services should be counted in the denominator population for MIPS CQMs.*
>
> **Denominator Criteria (Eligible Cases):**
> Patients aged ≥ 18 years
> **AND**
> **At least two patient encounters during the performance period (CPT or HCPCS):** 90791, 90792, 90832, 90834, 90837, 90845, 96150, 96151, 96152, 97165, 97166, 97167, 97168, 97802, 97803, 97804, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, G0270, G0271
> **WITHOUT**
> **Telehealth Modifier:** GQ, GT, 95, POS 02
> **OR**

At Least One Preventive Visit during the performance period (CPT or HCPCS): 96160, 96161, 99385*, 99386*, 99387*, 99395*, 99396*, 99397*, 99401*, 99402*, 99403*, 99404*, 99411*, 99412*, 99429*, G0438, G0439
WITHOUT
Telehealth Modifier: GQ, GT, 95, POS 02

NUMERATOR:
Patients who were screened for unhealthy alcohol use using a systematic screening method at least once within the last 24 months AND who received brief counseling if identified as an unhealthy alcohol user

Definitions:
Systematic screening method – For purposes of this measure, one of the following systematic methods to assess unhealthy alcohol use must be utilized. Systematic screening methods and thresholds for defining unhealthy alcohol use include:

- AUDIT Screening Instrument (score ≥ 8)
- AUDIT-C Screening Instrument (score ≥ 4 for men; score ≥ 3 for women)
- Single Question Screening - How many times in the past year have you had 5 (for men) or 4 (for women and all adults older than 65 years) or more drinks in a day? (response ≥ 2)

Brief counseling – Brief counseling for unhealthy alcohol use refers to one or more counseling sessions, a minimum of 5-15 minutes, which may include: feedback on alcohol use and harms; identification of high risk situations for drinking and coping strategies; increased motivation and the development of a personal plan to reduce drinking.

NUMERATOR NOTE: *In the event that a patient is screened for unhealthy alcohol use and identified as a user but did not receive brief alcohol cessation counseling submit G9624. Denominator Exception(s) are determined on the date of the most recent denominator eligible encounter.*

Numerator Options:

Performance Met:	Patient identified as an unhealthy alcohol user when screened for unhealthy alcohol use using a systematic screening method and received brief counseling **(G9621)**
OR	
Performance Met:	Patient not identified as an unhealthy alcohol user when screened for unhealthy alcohol use using a systematic screening method **(G9622)**
OR	
Denominator Exception:	Documentation of medical reason(s) for not screening for unhealthy alcohol use (e.g., limited life expectancy, other medical reasons) **(G9623)**
OR	
Performance Not Met:	Patient not screened for unhealthy alcohol use using a systematic screening method OR patient did not receive brief counseling if identified as an unhealthy alcohol user, reason not given **(G9624)**

RATIONALE:
This measure is intended to promote unhealthy alcohol use screening and brief counseling which have been shown to be effective in reducing alcohol consumption. About 30% of the U.S. population misuse alcohol, with most engaging in what is considered risky drinking. (SAMHSA, 2012) A recent analysis of data from the National Alcohol Survey shows that approximately one-third of at-risk drinkers (32.4%) and persons with a current alcohol use

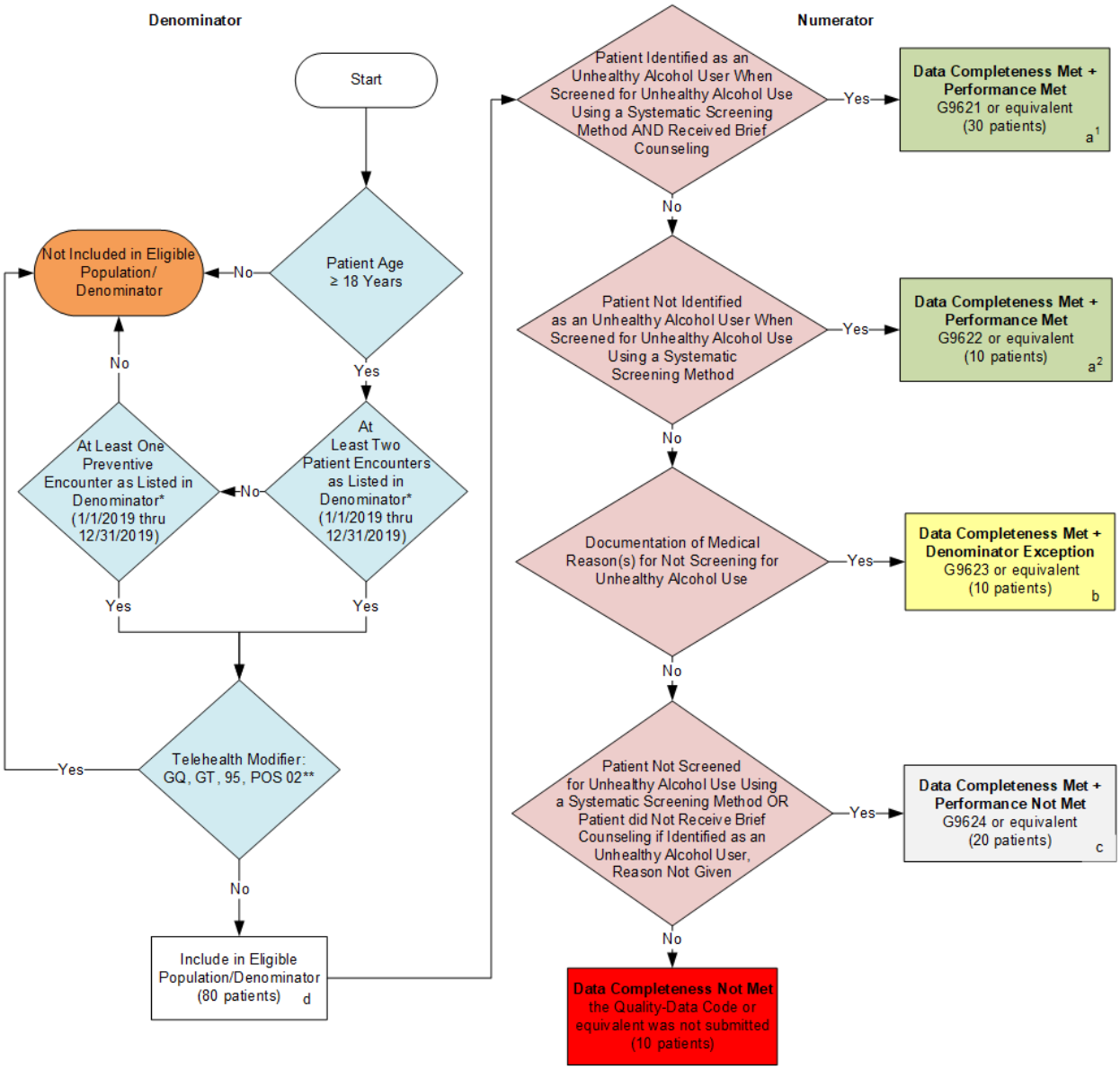
disorder (31.5%) in the United States had at least 1 primary care visit during the prior year, demonstrating the potential reach of screening and brief counseling for unhealthy alcohol use in the primary care setting. (Mulia et al., 2011) A number of studies, including patient and provider surveys, have documented low rates of alcohol misuse screening and counseling in primary care settings. In the national Healthcare for Communities Survey, only 8.7% of problem drinkers reported having been asked and counseled about their alcohol use in the last 12 months. (D'Amico et al., 2005) A nationally representative sample of 648 primary care physicians were surveyed to determine how such physicians identify--or fail to identify--substance abuse in their patients, what efforts they make to help these patients and what are the barriers to effective diagnosis and treatment. Of physicians who conducted annual health histories, less than half ask about the quantity and frequency of alcohol use (45.3 percent). Only 31.8 percent say they ever administer standard alcohol or drug use screening instruments to patients. (CASA, 2000)

CLINICAL RECOMMENDATION STATEMENTS:

The USPSTF recommends that clinicians screen adults aged 18 years or older for alcohol misuse and provide persons engaged in risky or hazardous drinking with brief behavioral counseling interventions to reduce alcohol misuse. (Grade B recommendation) (USPSTF, 2014)

COPYRIGHT:

2019 Clinical Quality Measure Flow for Quality ID #431 NQF #2152: Preventive Care and Screening: Unhealthy Alcohol Use: Screening & Brief Counseling



SAMPLE CALCULATIONS:

Data Completeness=

Performance Met (a^1+a^2 =40 patients) + Denominator Exception (b=10 patients) + Performance Not Met (c=20 patients) / Eligible Population / Denominator (d=80 patients) = 70 patients / 80 patients = **87.50%**

Performance Rate=

Performance Met (a^1+a^2 =40 patients) / Data Completeness Numerator (70 patients) – Denominator Exception (b=10 patients) = 40 patients / 60 patients = **66.67%**

*See the posted Measure Specification for specific coding and instructions to submit this measure.
**All encounters should be without the telehealth modifier in order to be denominator eligible.
Note: Submission Frequency: Patient-Process

v3

2019 Clinical Quality Measure Flow Narrative for Quality ID #431 NQF #2152: Preventive Care and Screening: Unhealthy Alcohol Use: Screening & Brief Counseling

Please refer to the specific section of the Measure Specification to identify the denominator and numerator information for use in submitting this Individual Measure.

1. Start with Denominator
2. Check Patient Age:
    a. If Patient Age is greater than or equal to 18 Years equals No during the performance period, do not include in Eligible Population. Stop Processing.
    b. If Patient Age is greater than or equal to 18 Years equals Yes during the performance period, proceed to check At Least Two Patient Encounters.
3. Check At Least Two Patient Encounters:
    a. If At Least Two Patient Encounters as Listed in the Denominator equals No, proceed to check At Least One Preventive Encounter.
    b. If At Least Two Patient Encounters as Listed in the Denominator equals Yes, proceed to check Telehealth Modifier.
4. Check Telehealth Modifier:
    a. If Telehealth Modifier equals Yes, proceed to check At Least One Preventive Encounter.
    b. If Telehealth Modifier equals No, include in Eligible Population.
5. Check At Least One Preventive Encounter:
    a. If At Least One Preventive Encounter as Listed in the Denominator equals No, do not include in Eligible Population. Stop Processing.
    b. If At Least One Preventive Encounter as Listed in the Denominator equals Yes, proceed to check Telehealth Modifier.
6. Check Telehealth Modifier:
    a. If Telehealth Modifier equals Yes, do not include in Eligible Population. Stop Processing.
    b. If Telehealth Modifier equals No, include in Eligible Population.
7. Denominator Population:
    a. Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d equals 80 patients in the Sample Calculation.
8. Start Numerator
9. Check Patient Identified as an Unhealthy Alcohol User When Screened for Unhealthy Alcohol Use Using a Systematic Screening Method AND Received Brief Counseling:

a. If Patient Identified as an Unhealthy Alcohol User When Screened for Unhealthy Alcohol Use Using a Systematic Screening Method AND Received Brief Counseling equals Yes, include in Data Completeness Met and Performance Met.

b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^1 equals 30 patients in the Sample Calculation.

c. If Patient Identified as an Unhealthy Alcohol User When Screened for Unhealthy Alcohol Use Using a Systematic Screening Method AND Received Brief Counseling equals No, proceed to check Patient Not Identified as an Unhealthy Alcohol User When Screened for Unhealthy Alcohol Use Using a Systematic Screening Method.

10. Check Patient Not Identified as an Unhealthy Alcohol User When Screened for Unhealthy Alcohol Use Using a Systematic Screening Method:

    a. If Patient Not Identified as an Unhealthy Alcohol User When Screened for Unhealthy Alcohol Use Using a Systematic Screening Method equals Yes, include in Data Completeness Met and Performance Met.

    b. Data Completeness Met and Performance Met letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^2 equals 10 patients in the Sample Calculation.

    c. If Patient Not Identified as an Unhealthy Alcohol User When Screened for Unhealthy Alcohol Use Using a Systematic Screening Method equals No, proceed to check Documentation of Medical Reason(s) for Not Screening for Unhealthy Alcohol Use.

11. Check Documentation of Medical Reason(s) for Not Screening for Unhealthy Alcohol Use:

    a. If Documentation of Medical Reason(s) for Not Screening for Unhealthy Alcohol Use equals Yes, include in Data Completeness Met and Denominator Exception.

    b. Data Completeness Met and Denominator Exception letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter b equals 10 patients in the Sample Calculation.

    c. If Documentation of Medical Reason(s) for Not Screening for Unhealthy Alcohol Use equals No, proceed to check Patient Not Screened for Unhealthy Alcohol Use Using a Systematic Screening Method OR Patient did Not Receive Brief Counseling if Identified as an Unhealthy Alcohol User, Reason Not Given.

12. Check Patient Not Screened for Unhealthy Alcohol Use Using a Systematic Screening Method OR Patient did Not Receive Brief Counseling if Identified as an Unhealthy Alcohol User, Reason Not Given:

    a. If Patient Not Screened for Unhealthy Alcohol Use Using a Systematic Screening Method OR Patient did Not Receive Brief Counseling if Identified as an Unhealthy Alcohol User, Reason Not Given equals Yes, include in Data Completeness Met and Performance Not Met.

    b. Data Completeness Met and Performance Not Met letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c equals 20 patients in the Sample Calculation.

    c. If Patient Not Screened for Unhealthy Alcohol Use Using a Systematic Screening Method OR Patient did Not Receive Brief Counseling if Identified as an Unhealthy Alcohol User, Reason Not Given equals No, proceed to check Data Completeness Not Met.

13. Check Data Completeness Not Met:

    a. If Data Completeness Not Met, the Quality Data Code or equivalent was not submitted. 10 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

SAMPLE CALCULATIONS:

Data Completeness=

$$\frac{\text{Performance Met } (a^1+a^2 = 40 \text{ patients}) + \text{Denominator Exception } (b=10 \text{ patients}) + \text{Performance Not Met } (c=20 \text{ patients})}{\text{Eligible Population / Denominator } (d=80 \text{ patients})} = \frac{70 \text{ patients}}{80 \text{ patients}} = \mathbf{87.50\%}$$

Performance Rate=

$$\frac{\text{Performance Met } (a^1+a^2 = 40 \text{ patients})}{\text{Data Completeness Numerator (70 patients)} - \text{Denominator Exception } (b=10 \text{ patients})} = \frac{40 \text{ patients}}{60 \text{ patients}} = \mathbf{66.67\%}$$

*Unhealthy Alcohol Use Screening and Follow-Up (ASF)**

***Adapted with financial support from the Substance Abuse and Mental Health Services Administration (SAMHSA) and with permission from the measure developer, the American Medical Association (AMA).**

SUMMARY OF CHANGES FOR HEDIS 2020

- Restructured the format of ECDS measures header layout (e.g., reformatted stratifications, added Participation Period to the *Definitions* section, removed underlining from value set names).
- Added Reporting to the *Guidance* section.
- Modified value sets to make them compatible with digital measure formatting.
- Added direct reference codes for Medicaid, Medicare, Private Health Insurance (Commercial), Birth Date and gender.
- Revised the former "Data Source" column to "Data Source Logic" in the Data Elements for Reporting tables.
- Removed the collection of the "Initial Population" and "Denominator" data elements by SSoR in the Data Elements for Reporting tables.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 18 years of age and older who were screened for unhealthy alcohol use using a standardized instrument and, if screened positive, received appropriate follow-up care.

- *Unhealthy Alcohol Use Screening*. The percentage of members who had a systematic screening for unhealthy alcohol use.
- *Alcohol Counseling or Other Follow-up Care*. The percentage of members receiving brief counseling or other follow-up care within 2 months of screening positive for unhealthy alcohol use.

Measurement Period

January 1–December 31.

Clinical Recommendation Statement

The USPSTF recommends that clinicians screen adults aged 18 years or older for alcohol misuse and provide brief behavioral counseling interventions to those who misuse alcohol.

References

U.S. Preventive Services Task Force. 2013. "Alcohol Misuse: Screening and Behavioral Counseling Interventions in Primary Care." Annals of Internal Medicine. 159:210-18.

Characteristics

Scoring Proportion.

Type Process.

Item count Person.

Stratification

1. Commercial 18–44*.
2. Commercial 45–64*.
3. Commercial 65+*.
4. Medicaid 18–44.
5. Medicaid 45–64.
6. Medicaid 65+.
7. Medicare 18–44.
8. Medicare 45–64.
9. Medicare 65+.

**Note that "Commercial" plans can be identified via the "Private Health Insurance" Direct Reference Code.*

Risk adjustment None.

Improvement notation A higher rate indicates better performance.

Guidance

Allocation:

The member was enrolled with a medical benefit throughout the Participation Period

Requirements:

Numerator 1: Look for any record of screening with a result, regardless of the screening instrument score.

Reporting:

The total for each product line is the sum of the age stratifications.

Definitions

Unhealthy Alcohol Use Screening A standard assessment instrument that has been normalized and validated for the adult patient population to include AUDIT, AUDIT-C and a Single-Question Screen. Screening requires completion of one or more instruments. The threshold for a positive finding is indicated below for each instrument.

Screening Instrument	Positive Finding
Alcohol Use Disorders Identification Test (AUDIT) Screening Instrument	Total score ≥8
Alcohol Use Disorders Identification Test Consumption (AUDIT-C) Screening Instrument	Total score ≥4 for men Total score ≥3 for women
Single-Question Screen: "How many times in the past year have you had 5 (for men) or 4 (for women and all adults older than 65 years) or more drinks in a day?"	Response ≥1

Alcohol Counseling or Other Follow-Up Care	An encounter on, or up to 60 days after, the date of the first positive screening that includes at least one of the following: • Feedback on alcohol use and harms. • Identification of high-risk situations for drinking and coping strategies. • Increase the motivation to reduce drinking. • Development of a personal plan to reduce drinking. • Documentation of receiving alcohol misuse treatment.
Participation	The identifiers and descriptors for each organization's coverage used to define members' eligibility for measure reporting. Allocation for reporting is based on eligibility during the participation period.
Participation Period	The Measurement Period.

Initial Population

Members 18 years and older at the start of the Measurement Period who also meet criteria for Participation.

Exclusions

Exclusions	Exclude members with any of the following: • Alcohol use disorder starting between January 1 of the year prior to the Measurement Period and December 31 of the Measurement Period. • History of dementia any time during the member's history through the end of the Measurement Period. • In hospice or using hospice services during the Measurement Period.

Unhealthy Alcohol Use Screening (Population Criteria 1)

Denominator 1	The Initial Population, minus Exclusions.
Numerator 1	Members with a documented result for unhealthy alcohol use screening performed between January 1 and November 1 of the Measurement Period.

Counseling or Other Follow-Up on Positive Screen (Population Criteria 2)

Denominator 2	All members in Numerator 1 with a positive finding for unhealthy alcohol use screening between January 1 and November 1 of the Measurement Period.
Numerator 2	Members receiving alcohol counseling or other follow-up care on or up to 60 days after the date of the first positive screen (61 days total).

Data Criteria (Element Level)

Value Sets:

- Diagnosis: Alcohol Use Disorder (2.16.840.1.113883.3.464.1004.1339)
- Diagnosis: Dementia (2.16.840.1.113883.3.464.1004.1074)
- Encounter, Performed: Hospice Encounter (2.16.840.1.113883.3.464.1004.1761)
- Intervention, Order: Hospice Intervention (2.16.840.1.113883.3.464.1004.1762)
- Intervention, Performed: Alcohol Counseling or Other Follow Up Care (2.16.840.1.113883.3.464.1004.1437)
- Intervention, Performed: Hospice Intervention (2.16.840.1.113883.3.464.1004.1762)

Direct Reference Codes:

- Assessment, Performed: How often have you had five or more drinks in one day during the past year [Reported] (LOINC version 2.63 Code 88037-7)
- Assessment, Performed: How often have you had four or more drinks in one day during the past year [Reported] (LOINC version 2.63 Code 75889-6)
- Assessment, Performed: Total score [AUDIT-C] (LOINC version 2.63 Code 75626-2)
- Assessment, Performed: Total score [AUDIT] (LOINC version 2.63 Code 75624-7)
- Participation: MEDICAID (SOP Code 2)
- Participation: MEDICARE (SOP Code 1)
- Participation: PRIVATE HEALTH INSURANCE (SOP Code 5)
- Patient Characteristic Birthdate: Birth date (LOINC Code 21112-8)
- Patient Characteristic Sex: Female (AdministrativeGender Code F)
- Patient Characteristic Sex: Male (AdministrativeGender Code M)

Data Elements for IDSS Reporting

Organizations that submit data to NCQA must provide the following data elements in a specified file.

Table ASF-A-1/2/3: Metadata Elements for Unhealthy Alcohol Use: Screening and Follow-Up

Metadata ID	Metadata Specification
MeasurementYear	Measurement year
CollectionMethod	Data collection methodology (electronic clinical data systems)

Table ASF-B -1/2/3: Data Elements for Unhealthy Alcohol Use: Screening and Follow-Up

Indicator	Age	Data Element	Data Source Logic
Unhealthy Alcohol Use Screening	18-44	Initial population	Summed over data sources
Counseling or Other Follow-Up on Positive Screen	45-64	Exclusions	Report by data source
	65+	Denominator	Summed over data sources
		Numerator	Report by data source

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Unhealthy Alcohol Use Screening and Follow-Up

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	The age determination dates may be changed (e.g., select, "age as of June 30"). Changing the denominator age range is allowed if the limits are within the specified age range (18 and older). Organizations must consult UPSTSF guidelines when considering whether to expand the age ranges outside of the current thresholds.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Using a benefit is not required; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Value sets, Direct Reference Codes and logic may not be changed for Denominator 2.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Exclusions	No	Apply exclusions according to specified Direct Reference Codes.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• Unhealthy Alcohol Use Screening • Counseling or Other Follow-Up on Positive Screen	No	Value sets, Direct Reference Codes and logic may not be changed.

Use of Imaging Studies for Low Back Pain (LBP)

SUMMARY OF CHANGES TO HEDIS 2020

- Modified value sets to make them compatible with digital measure formatting.
- Removed "with or without a telehealth modifier" language; refer to *General Guideline 43*.
- Added instructions for excluding outpatient visits that result in an inpatient stay.
- Clarified the timing of the prolonged use of corticosteroids exclusion in step 4 of the event/diagnosis criteria.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members with a primary diagnosis of low back pain who did not have an imaging study (plain X-ray, MRI, CT scan) within 28 days of the diagnosis.

Calculation

The measure is reported as an inverted rate [1–(numerator/eligible population)]. A higher score indicates appropriate treatment of low back pain (i.e., the proportion for whom imaging studies did not occur).

Definitions

Intake Period	January 1–December 3 of the measurement year. The Intake Period is used to identify the first eligible encounter with a primary diagnosis of low back pain.
IESD	Index Episode Start Date. The earliest date of service for an eligible encounter during the Intake Period with a principal diagnosis of low back pain.
Negative Diagnosis History	A period of 180 days (6 months) prior to the IESD when the member had no claims/encounters with any diagnosis of low back pain.

Eligible Population

Note: *Members in hospice are excluded from the eligible population. Refer to General Guideline 17: Members in Hospice.*

Product line	Commercial, Medicaid (report each product line separately).
Ages	18 years as of January 1 of the measurement year to 50 years as of December 31 of the measurement year.
Continuous enrollment	180 days (6 months) prior to the IESD through 28 days after the IESD.
Allowable gap	No gaps in enrollment during the continuous enrollment period.

Anchor date IESD.

Benefit Medical.

Event/diagnosis Follow the steps below to identify the eligible population.

Step 1 Identify all members in the specified age range who had any of the following during the Intake Period:

- Outpatient visit (Outpatient Value Set) with a principal diagnosis of uncomplicated low back pain (Uncomplicated Low Back Pain Value Set).
- An observation visit (Observation Value Set) or an ED visit (ED Value Set) with a principal diagnosis of uncomplicated low back pain (Uncomplicated Low Back Pain Value Set).
  - Do not include outpatient, ED or observation visits that result in an inpatient stay (Inpatient Stay Value Set).
- Osteopathic or chiropractic manipulative treatment (Osteopathic and Chiropractic Manipulative Treatment Value Set) with a principal diagnosis of uncomplicated low back pain (Uncomplicated Low Back Pain Value Set).
- Physical therapy visit (Physical Therapy Value Set) with a principal diagnosis of uncomplicated low back pain (Uncomplicated Low Back Pain Value Set).
- Telephone visit (Telephone Visits Value Set) with a principal diagnosis of uncomplicated low back pain (Uncomplicated Low Back Pain Value Set).
- Online assessment (Online Assessments Value Set) with a principal diagnosis of uncomplicated low back pain (Uncomplicated Low Back Pain Value Set).

Step 2 Determine the IESD. For each member identified in step 1, determine the earliest episode of low back pain. If the member had more than one encounter, include only the first encounter.

Step 3 Test for Negative Diagnosis History. Exclude members with a diagnosis of uncomplicated low back pain (Uncomplicated Low Back Pain Value Set) during the 180 days (6 months) prior to the IESD.

Step 4: Required exclusions Exclude any member who had a diagnosis for which imaging is clinically appropriate. Any of the following meet criteria:

- *Cancer.* Cancer any time during the member's history through 28 days after the IESD. Any of the following meet criteria:
  - Malignant Neoplasms Value Set.
  - Other Neoplasms Value Set.
  - History of Malignant Neoplasm Value Set.
  - Other Malignant Neoplasm of Skin Value Set.
- *Recent trauma.* Trauma (Trauma Value Set) any time during the 3 months (90 days) prior to the IESD through 28 days after the IESD.
- *Intravenous drug abuse.* IV drug abuse (IV Drug Abuse Value Set) any time during the 12 months (1 year) prior to the IESD through 28 days after the IESD.

- *Neurologic impairment*. Neurologic impairment (Neurologic Impairment Value Set) any time during the 12 months (1 year) prior to the IESD through 28 days after the IESD.
- *HIV.* HIV (HIV Value Set) any time during the member's history through 28 days after the IESD.
- *Spinal infection.* Spinal infection (Spinal Infection Value Set) any time during the 12 months (1 year) prior to the IESD through 28 days after the IESD.
- *Major organ transplant.* Major organ transplant (Organ Transplant Other Than Kidney Value Set; Kidney Transplant Value Set; History of Kidney Transplant Value Set) any time in the member's history through 28 days after the IESD.
- *Prolonged use of corticosteroids.* 90 consecutive days of corticosteroid treatment any time during the 366-day period that begins 365 days prior to the IESD and ends on the IESD.

  To identify consecutive treatment days, identify calendar days covered by at least one dispensed corticosteroid (Corticosteroid Medications List). For overlapping prescriptions and multiple prescriptions on the same day assume the member started taking the second prescription after exhausting the first prescription. For example, if a member had a 30-day prescription dispensed on June 1 and a 30-day prescription dispensed on June 26, there are 60 covered calendar days (June 1–July 30).

  Count only medications dispensed during the 12 months (1 year) prior to and including the IESD. When identifying consecutive treatment days, do not count days supply that extend beyond the IESD. For example, if a member had a 90-day prescription dispensed on the IESD, there is one covered calendar day (the IESD).

  No gaps are allowed.

Corticosteroid Medications

Description	Prescription	
Corticosteroid	• Hydrocortisone	• Methylprednisolone
	• Cortisone	• Triamcinolone
	• Prednisone	• Dexamethasone
	• Prednisolone	• Betamethasone

Step 5 Calculate continuous enrollment. Members must be continuously enrolled for 180 days (6 months) prior to the IESD through 28 days after the IESD.

Administrative Specification

Denominator The eligible population.

Numerator An imaging study (Imaging Study Value Set) with a diagnosis of uncomplicated low back pain (Uncomplicated Low Back Pain Value Set) on the IESD or in the 28 days following the IESD.

Note

- *Although denied claims are not included when assessing the numerator, all claims (paid, suspended, pending and denied) must be included when identifying the eligible population.*
- *Do not include supplemental data when identifying the eligible population or assessing the numerator. Supplemental data can be used for only required exclusions for this measure.*

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table LBP-1/2: Data Elements for Use of Imaging Studies for Low Back Pain

	Administrative
Measurement year	✓
Data collection methodology (Administrative)	✓
Eligible population	✓
Number of required exclusions	✓
Numerator events by administrative data	✓
Reported rate	✓

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Use of Imaging Studies for Low Back Pain

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	The age determination dates may be changed (e.g., select, "age as of June 30"). Changing the denominator age range is allowed if the limits are within the specified age range (18–50 years). The denominator age may not be expanded.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed. ***Note:*** *Changes to* these *criteria can affect how* the *event/diagnosis will be calculated using* the *Intake Period, IESD, Negative Diagnosis History.*
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Only events that contain (or map to) codes in the value sets may be used to identify visits, treatment, therapy or online assessment. The value sets and logic may not be changed.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Required Exclusions	No	Apply required exclusions according to specified medication lists and value sets.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
Imaging Study	No	Value sets and logic may not be changed. Organizations may include denied claims to calculate the numerator.

*Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults (DMS)**

***Adapted with financial support from the Agency for Healthcare Research and Quality (AHRQ) and CMS under the CHIPRA Pediatric Quality Measures Program Centers of Excellence grant number U18HS025296, from depression measures developed by Minnesota Community Measurement.**

SUMMARY OF CHANGES TO HEDIS 2020

- Restructured the format of ECDS measures header layout (e.g., reformatted stratifications, added Participation Period to the *Definitions* section, removed underlining from value set names).
- Revised Item Count from Encounters to Person.
- Added Reporting to the *Guidance* section.
- Added a definition for *Interactive Outpatient Encounter*.
- Modified value sets to make them compatible with digital measure formatting.
- Added individual Initial Populations for each of the three rates.
- Added individual Exclusions for each of the three rates.
- Moved each of the three Denominator criteria to the corresponding Initial Population.
- Added direct reference codes for Medicaid, Medicare, Private Health Insurance (Commercial) and Birth Date.
- Revised the former “Data Source” column to “Data Source Logic” in the Data Elements for Reporting tables.
- Removed the collection of the “Denominator” data element by SSoR in the Data Elements for Reporting tables.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 12 years of age and older with a diagnosis of major depression or dysthymia, who had an outpatient encounter with a PHQ-9 score present in their record in the same assessment period as the encounter.

Measurement Period

January 1–December 31.

The Measurement Period is divided into three assessment periods with specific dates of service:

- *Assessment Period 1:* January 1–April 30.
- *Assessment Period 2:* May 1–August 31.
- *Assessment Period 3:* September 1–December 31.

Clinical Recommendation Statement

Standardized instruments are useful in identifying meaningful change in clinical outcomes over time. Guidelines for adults recommend that providers establish and maintain regular follow-up with patients diagnosed with depression and use a standardized tool to track symptoms. For adolescents, guidelines recommend systematic and regular tracking of treatment goals and outcomes, including assessing depressive symptoms.

The PHQ-9 tool assesses the nine DSM, Fourth Edition, Text Revision (DSM-IV-TR) criteria symptoms and effects on functioning, and it has been shown to be highly accurate in discriminating between patients with persistent major depression, partial remission and full remission.

References

Trangle, M., J. Gursky, R. Haight, J. Hardwig, T. Hinnenkamp, D. Kessler, N. Mack, M. Myszkowski. Institute for Clinical Systems Improvement. *Adult Depression in Primary Care.* Updated March 2016.

Cheung, A.H., R.A. Zuckerbrot, P.S. Jensen, D. Laraque, R.E.K. Stein, GLAD-PC STEERING GROUP. 2018. "Guidelines for Adolescent Depression in Primary Care (GLAD-PC): II. Treatment and Ongoing management." *Pediatrics* 141(3):e20174082.

Characteristics

Scoring	Proportion.
Type	Process.
Item count	Person.
Stratification	1. Commercial: 12–17*. 2. Commercial: 18–44*. 3. Commercial: 45–64*. 4. Commercial: 65+*. 5. Medicaid: 12–17. 6. Medicaid: 18–44. 7. Medicaid: 45–64. 8. Medicaid: 65+. 9. Medicare: 18–44. 10. Medicare: 45–64. 11. Medicare: 65+. **Note that "Commercial" plans can be identified via the "Private Health Insurance" Direct Reference Code.*
Risk adjustment	None.
Improvement notation	A higher rate indicates better performance.
Guidance	**Allocation:** The member was enrolled with a medical benefit throughout the Participation Period. **Requirements:** • Members may have an eligible encounter in any or all three assessment periods and may be included in the measure up to three times during the Measurement Period. • The measure allows the use of two PHQ-9 assessments. Selection of the appropriate assessment should be based on the member's age.

  - *PHQ-9:* 12 years of age and older.
  - *PHQ-9 Modified for Teens:* 12–17 years of age.
- When identifying encounters where a diagnosis of major depression or dysthymia was addressed, look for visits for depression/dysthymia. When using only claims data, the diagnosis code and the visit must be from the same visit.
- The PHQ-9 assessment does not need to occur during a face-to-face encounter; it may be completed over the telephone or through a web-based portal.

Reporting:

The total for each product line is the sum of the age stratifications.

Definitions

Participation	The identifiers and descriptors for each organization's coverage used to define members' eligibility for measure reporting. Allocation for reporting is based on eligibility during the Participation Period.
Participation period	The Measurement Period.
Interactive Outpatient Encounter	A bidirectional communication that is face-to-face, phone based or via secure electronic messaging. This does not include communications for scheduling appointments.

Exclusions

Exclusions

Members with any of the following at any time during the Measurement Period:

- Bipolar disorder.
- Personality disorder.
- Psychotic disorder.
- Pervasive developmental disorder.
- In hospice or using hospice services.

Utilization of PHQ-9 Period 1 (Population Criteria 1)

Initial Population 1	Members 12 years and older at the start of the Measurement Period who also meet the criteria for Participation, with at least one interactive outpatient encounter during Assessment Period 1, with a diagnosis of major depression or dysthymia.
Exclusions 1	Members in Initial Population 1 who meet the Exclusions criteria.
Denominator 1	The Initial Population 1, minus Exclusions.
Numerator 1	A PHQ-9 score in the member's record during Assessment Period 1.

Utilization of PHQ-9 Period 2 (Population Criteria 2)

Initial Population 2	Members 12 years and older at the start of the Measurement Period who also meet the criteria for Participation, with at least one interactive outpatient encounter during Assessment Period 2, with a diagnosis of major depression or dysthymia.
Exclusions 2	Members in Initial Population 2 who meet the Exclusions criteria.
Denominator 2	The Initial Population 2, minus Exclusions.
Numerator 2	A PHQ-9 score in the member's record during Assessment Period 2.

Utilization of PHQ-9 Period 3 (Population Criteria 3)

Initial Population 3	Members 12 years and older at the start of the Measurement Period who also meet the criteria for Participation, with at least one Interactive Outpatient Encounter during Assessment Period 3, with a diagnosis of major depression or dysthymia.
Exclusions 3	Members in Initial Population 3 who meet the Exclusions criteria.
Denominator 3	The Initial Population 3, minus Exclusions.
Numerator 3	A PHQ-9 score in the member's record during Assessment Period 3.

Data Criteria (Element Level)

Value Sets:

- Diagnosis: Bipolar Disorder (2.16.840.1.113883.3.464.1004.1044)
- Diagnosis: Major Depression or Dysthymia (2.16.840.1.113883.3.464.1004.1351)
- Diagnosis: Other Bipolar Disorder (2.16.840.1.113883.3.464.1004.1399)
- Diagnosis: Personality Disorder (2.16.840.1.113883.3.464.1004.1355)
- Diagnosis: Pervasive Developmental Disorder (2.16.840.1.113883.3.464.1004.1356)
- Diagnosis: Psychotic Disorders (2.16.840.1.113883.3.464.1004.1352)
- Encounter, Performed: Interactive Outpatient Encounter (2.16.840.1.113883.3.464.1004.1347)
- Encounter, Performed: Hospice Encounter (2.16.840.1.113883.3.464.1004.1761)
- Intervention, Order: Hospice Intervention (2.16.840.1.113883.3.464.1004.1762)
- Intervention, Performed: Hospice Intervention (2.16.840.1.113883.3.464.1004.1762)

Direct Reference Codes:

- Assessment, Performed: Patient Health Questionnaire 9 item (PHQ-9) total score [Reported] (LOINC Code 44261-6)
- Assessment, Performed: Patient Health Questionnaire-9: Modified for Teens total score [Reported.PHQ.Teen] (LOINC Code 89204-2)
- Participation: MEDICAID (SOP Code 2)
- Participation: MEDICARE (SOP Code 1)

- Participation: PRIVATE HEALTH INSURANCE (SOP Code 5)
- Patient Characteristic Birthdate: Birth date (LOINC Code 21112-8)

Data Elements for IDSS Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table DMS-A-1/2/3: Metadata Elements for Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults

Metadata ID	Metadata Specification
MeasurementYear	Measurement year
CollectionMethod	Data collection methodology (electronic clinical data)

Table DMS-B-1/2: Data Elements for Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults (Medicaid and commercial)

Indicator	Age	Data Element	Data Source Logic
Utilization of PHQ-9-Period 1	12-17	Initial population	Report by data source
Utilization of PHQ-9-Period 2	18-44	Exclusions	Report by data source
Utilization of PHQ-9-Period 3	45-64	Denominator	Summed over data sources
	65+	Numerator	Report by data source

Table DMS-B-3: Data Elements for Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults (Medicare)

Indicator	Age	Data Element	Data Source Logic
Utilization of PHQ-9-Period 1	18-44	Initial population	Report by data source
Utilization of PHQ-9-Period 2	45-64	Exclusions	Report by data source
Utilization of PHQ-9-Period 3	65+	Denominator	Summed over data sources
		Numerator	Report by data source

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Utilization of the PHQ-9 to Monitor Depression Symptoms for Adolescents and Adults

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	The age determination dates may be changed (e.g., select, "age as of June 30"). Changing the denominator age range is allowed if the limits are within the specified age range (12 and older). Expanding the denominator age range to 11 and older is allowed.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefits	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Only events or diagnoses that contain (or map to) codes in the value sets may be used to identify visits with a diagnosis. The value sets and logic may not be changed.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Exclusions	No	Apply exclusions according to specified value sets.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
PHQ-9 Score	No	Value sets, Direct Reference Codes and logic may not be changed.

Weight Assessment and Counseling for Nutrition and Physical Activity for Children/Adolescents (WCC)

SUMMARY OF CHANGES TO HEDIS 2020

- Clarified in the *Notes* that referral to WIC may be used to meet criteria for the Counseling for Nutrition indicator.
- Added the *Rules for Allowable Adjustments of HEDIS* section.

Description

The percentage of members 3–17 years of age who had an outpatient visit with a PCP or OB/GYN and who had evidence of the following during the measurement year.

- BMI percentile documentation*.
- Counseling for nutrition.
- Counseling for physical activity.

***Because BMI norms for youth vary with age and gender, this measure evaluates whether BMI percentile is assessed rather than an absolute BMI value.*

Definitions

BMI percentile The percentile ranking based on the CDC's BMI-for-age growth charts, which indicates the relative position of the patient's BMI number among others of the same gender and age.

Eligible Population

***Note:** Members in hospice are excluded from the eligible population. If an organization reports this measure using the Hybrid method, and a member is found to be in hospice or using hospice services during medical record review, the member is removed from the sample and replaced by a member from the oversample. Refer to General Guideline 17: Members in Hospice.*

Product lines Commercial, Medicaid (report each product line separately).

Ages 3–17 years as of December 31 of the measurement year. Report two age stratifications and a total for each of the three indicators:

- 3–11 years.
- 12–17 years.
- Total.

The total is the sum of the age stratifications.

Continuous enrollment The measurement year.

Allowable gap No more than one gap in continuous enrollment of up to 45 days during the measurement year. To determine continuous enrollment for a Medicaid beneficiary for whom enrollment is verified monthly, the member may not have more than a 1-month gap in coverage (i.e., a member whose coverage lapses for 2 months [60 days] is not considered continuously enrolled).

Anchor date December 31 of the measurement year.

Benefit Medical.

Event/diagnosis An outpatient visit (Outpatient Value Set) with a PCP or an OB/GYN during the measurement year.

Administrative Specification

Denominator The eligible population.

Numerators

BMI Percentile BMI percentile (BMI Percentile Value Set) during the measurement year.

Counseling for Nutrition Counseling for nutrition (Nutrition Counseling Value Set) during the measurement year.

Counseling for Physical Activity Counseling for physical activity (Physical Activity Counseling Value Set) during the measurement year.

Exclusions *(optional)*

Female members who have a diagnosis of pregnancy (Pregnancy Value Set) during the measurement year. The denominator for all rates must be the same. An organization that excludes these members must do so for all rates.

Hybrid Specification

Denominator A systematic sample drawn from the eligible population for each product line for the Total age band (3–17 years). The Total sample is stratified by age to report rates for the 3–11 and 12–17 age stratifications.

Organizations may reduce the sample size using the current year's administrative rate or the prior year's audited, product line-specific rate for the lowest of the three indicator rates for the Total age band. Refer to the *Guidelines for Calculations and Sampling* for information on reducing the sample size.

Numerators

BMI Percentile BMI percentile during the measurement year as identified by administrative data or medical record review.

Administrative Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record

Documentation must include height, weight and BMI percentile during the measurement year. The height, weight and BMI percentile must be from the same data source.

Either of the following meets criteria for BMI percentile:

- BMI percentile documented as a value (e.g., 85th percentile).
- BMI percentile plotted on an age-growth chart.

Only evidence of the BMI percentile or BMI percentile plotted on an age-growth chart meets criteria.

Ranges and thresholds do not meet criteria for this indicator. A distinct BMI percentile is required for numerator compliance. Documentation of >99% or <1% meet criteria because a distinct BMI percentile is evident (i.e., 100% or 0%).

Counseling for Nutrition

Documentation of counseling for nutrition or referral for nutrition education during the measurement year as identified by administrative data or medical record review.

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from administrative data.

Medical record

Documentation must include a note indicating the date and at least one of the following:

- Discussion of current nutrition behaviors (e.g., eating habits, dieting behaviors).
- Checklist indicating nutrition was addressed.
- Counseling or referral for nutrition education.
- Member received educational materials on nutrition during a face-to-face visit.
- Anticipatory guidance for nutrition.
- Weight or obesity counseling.

Counseling for Physical Activity

Documentation of counseling for physical activity or referral for physical activity during the measurement year as identified by administrative data or medical record review.

Administrative

Refer to *Administrative Specification* to identify positive numerator hits from the administrative data.

Medical record

Documentation must include a note indicating the date and at least one of the following:

- Discussion of current physical activity behaviors (e.g., exercise routine, participation in sports activities, exam for sports participation).
- Checklist indicating physical activity was addressed.
- Counseling or referral for physical activity.
- Member received educational materials on physical activity during a face-to-face visit.
- Anticipatory guidance specific to the child's physical activity.
- Weight or obesity counseling.

Exclusions *(optional)*

Refer to *Administrative Specification* for exclusion criteria. Exclusionary evidence in the medical record must include a note indicating a diagnosis of pregnancy. The diagnosis must have occurred during the measurement year.

Note

- *The following notations or examples of documentation do not count as numerator compliant:*
  - ***BMI***
    - *No BMI percentile documented in medical record or plotted on age-growth chart.*
    - *Notation of BMI value only.*
    - *Notation of height and weight only.*
  - ***Nutrition***
    - *No counseling/education on nutrition and diet.*
    - *Counseling/education before or after the measurement year.*
    - *Notation of "health education" or "anticipatory guidance" without specific mention of nutrition.*
    - *A physical exam finding or observation alone (e.g., well-nourished) is not compliant because it does not indicate counseling for nutrition.*
    - *Documentation related to a member's "appetite" does not meet criteria.*
  - ***Physical Activity***
    - *No counseling/education on physical activity.*
    - *Notation of "cleared for gym class" alone without documentation of a discussion.*
    - *Counseling/education before or after the measurement year.*
    - *Notation of "health education" or "anticipatory guidance" without specific mention of physical activity.*
    - *Notation of anticipatory guidance related solely to safety (e.g., wears helmet or water safety) without specific mention of physical activity recommendations.*
    - *Notation solely related to screen time (computer or television) without specific mention of physical activity.*
- *Services may be rendered during a visit other than a well-child visit. These services count if the specified documentation is present, regardless of the primary intent of the visit; however, services specific to the assessment or treatment of an acute or chronic condition do not count toward the Counseling for Nutrition and Counseling for Physical Activity indicators.*

  For example, the following documentation is specific to the assessment or treatment of an acute or chronic condition and does not meet criteria:
  - *Notation that a member with chronic knee pain is able to run without limping.*
  - *Notation that a member has exercise-induced asthma.*
  - *Notation that a member with diarrhea is following the BRAT diet.*
  - *Notation that a member has decreased appetite as a result of an acute or chronic condition.*
- *Services rendered for obesity or eating disorders may be used to meet criteria for the Counseling for Nutrition and Counseling for Physical Activity indicators if the specified documentation is present.*
- *Referral to the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) may be used to meet criteria for the Counseling for Nutrition indicator.*
- *Refer to Appendix 3 for the definition of* PCP *and* OB/GYN practitioner.

Data Elements for Reporting

Organizations that submit HEDIS data to NCQA must provide the following data elements.

Table WCC-1/2: Data Elements for Weight Assessment and Counseling for Nutrition and Physical Activity for Children/Adolescents

	Administrative	Hybrid
Measurement year	✓	✓
Data collection methodology (Administrative or Hybrid)	*Each of the 3 rates*	*Each of the 3 rates*
Eligible population	*For each age stratification and total*	*Each of the 3 rates, for each age stratification and total*
Number of numerator events by administrative data in eligible population (before exclusions)		*Each of the 3 rates, for each age stratification and total*
Current year's administrative rate (before exclusions)		*Each of the 3 rates, for each age stratification and total*
Minimum required sample size (MRSS)		*Each of the 3 rates*
Oversampling rate		*Each of the 3 rates*
Number of oversample records		*Each of the 3 rates*
Number of numerator events by administrative data in MRSS		*Each of the 3 rates, for each age stratification and total*
Administrative rate on MRSS		*Each of the 3 rates, for each age stratification and total*
Number of medical records excluded because of valid data errors		*Each of the 3 rates*
Number of administrative data records excluded		*Each of the 3 rates*
Number of medical records excluded		*Each of the 3 rates*
Number of employee/dependent medical records excluded		*Each of the 3 rates*
Records added from the oversample list		*Each of the 3 rates*
Denominator		*Each of the 3 rates, for each age stratification and total*
Numerator events by administrative data	*Each of the 3 rates, for each age stratification and total*	*Each of the 3 rates, for each age stratification and total*
Numerator events by medical records		*Each of the 3 rates, for each age stratification and total*
Numerator events by supplemental data	*Each of the 3 rates, for each age stratification and total*	*Each of the 3 rates, for each age stratification and total*
Reported rate	*Each of the 3 rates, for each age stratification and total*	*Each of the 3 rates, for each age stratification and total*

Rules for Allowable Adjustments of HEDIS

This section *may not* be used for reporting health plan HEDIS. HEDIS measures may not be adjusted for any NCQA program.

NCQA's Rules for Allowable Adjustments of HEDIS describe how NCQA's HEDIS measure specifications can be adjusted for non-health plan reporting. Refer to the *Guidelines for the Rules of Allowable Adjustments of HEDIS* for additional information.

Rules for Allowable Adjustments for Weight Assessment and Counseling for Nutrition and Physical Activity for Children/Adolescents

NONCLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Product Lines	Yes	Organizations are not required to use product line criteria; product lines may be combined and all (or no) product line criteria may be used.
Ages	Yes, with limits	Age determination dates may be changed (e.g., select, "age as of June 30"). The denominator age may be changed if the range is within the specified age range (3–17 years). Organizations must consult UPSTSF guidelines when considering whether to expand the age ranges outside of the current thresholds.
Continuous enrollment, Allowable gap, Anchor Date	Yes	Organizations are not required to use enrollment criteria; adjustments are allowed.
Benefit	Yes	Organizations are not required to use a benefit; adjustments are allowed.
Other	Yes	Organizations may use additional eligible population criteria to focus on a population of interest such as gender, sociodemographic characteristic or geographic region.
CLINICAL COMPONENTS		
Eligible Population	**Adjustments Allowed (Yes/No)**	**Notes**
Event/Diagnosis	No	Only events or diagnoses that contain (or map to) codes in value sets may be used to identify visits. The value sets and logic may not be changed.
Denominator Exclusions	**Adjustments Allowed (Yes/No)**	**Notes**
Optional Exclusions	No, if applied	Optional exclusions are not required, but if they are used, only specified exclusions may be applied. Value sets may not be changed.
Numerator Criteria	**Adjustments Allowed (Yes/No)**	**Notes**
• BMI Percentile • Counseling for Nutrition • Counseling for Physical Activity	No	Value sets and logic may not be changed.