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QUALITY FORUM**

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Patient Safety, Fall 2019 Cycle, Track 1 Measures: CDP Report

**TECHNICAL REPORT
SEPTEMBER 14, 2020**

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Executive Summary

Patient safety-related events occur across healthcare settings and include a variety of preventable incidents such as healthcare-associated infections and medication-related errors. In 1999, the Institute of Medicine published a seminal report that identified medical errors as a major cause of patient safety events, causing hundreds of thousands of preventable deaths each year in the United States.¹

Since that time, quality improvement and performance measurement efforts have helped to drive substantial reductions in patient safety-related events across care settings, such as reductions in catheter-associated urinary tract infections and central-line-associated bloodstream infections.² Yet, despite these improvements in safety, opportunities still exist to reduce harm and promote more affordable, effective, and equitable care.

The National Quality Forum (NQF) Patient Safety Standing Committee oversees the NQF Patient Safety portfolio and assesses both novel and existing performance measures for endorsement using NQF's measure evaluation criteria. This review cycle included measures related to the following key safety topics: medication reconciliation, hyperglycemia, bladder catheterization, and urinary tract infections. Additionally, the Standing Committee provides feedback on gaps and priorities related to patient safety and contributes to the advancement of measurement in this area.

For this project, the Standing Committee evaluated one newly submitted measure and three measures undergoing maintenance review against NQF's standard evaluation criteria. The Committee endorsed all four measures for endorsement. The four endorsed measures are:

- **NQF 0684** Percent of Residents with a Urinary Tract Infection (Long Stay)
- **NQF 0686** Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long Stay)
- **NQF 2456** Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
- **NQF 3533e** Hospital Harm – Severe Hyperglycemia

Due to circumstances around the COVID-19 global pandemic, commenting periods for all measures evaluated in the Fall 2019 cycle were extended from 30 days to 60 days. Based on the comments received during this 60-day extended commenting period, measures entered into one of two tracks:

Track 1: measures continuing its review in Fall 2019 Cycle:

- **NQF 0684** Percent of Residents with a Urinary Tract Infection (Long Stay)
- **NQF 0686** Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long Stay)
- **NQF 2456** Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient
- **NQF 3533e** Hospital Harm – Severe Hyperglycemia

Track 2: measures deferred to Spring 2020 Cycle:

- None

This report contains details of the evaluation of measures assigned to Track 1 and are continuing in the Fall 2019 cycle. The detailed evaluation summary of measures assigned to Track 2 and deferred to the Spring 2020 cycle will be included in a subsequent report. Brief summaries of the Fall 2019 Track 1 measures currently under review are included in the body of the report; detailed summaries of the Committee's discussion and ratings of the criteria for each measure are in [Appendix A](#).

Introduction

Addressing patient safety is central to advancing healthcare quality and improving healthcare delivery. It has been more than 20 years since the Institute of Medicine published a series of seminal reports that ushered in the modern era of patient safety with a focus on transparency and eliminating harm in healthcare settings.^{1,3} Since that time, the National Quality Forum (NQF) has led various initiatives to measure patient safety performance, promote safe practices, and identify and reduce serious reportable events (SREs) and hospital-acquired conditions (HACs). These efforts have also involved expanding the number of high quality patient safety measures across settings as well as promoting alignment of existing measures.

Patient safety measurement and quality improvement efforts represent one of the most successful applications of quality measurement and have had a significant impact on patient safety events in U.S. hospitals. According to the AHRQ National Scorecard on Hospital-Acquired Conditions Updated Baseline Rates and Preliminary Results, HACs fell by approximately 13 percent from 2014 through 2017. Within that same time, national efforts targeting these conditions helped prevent 20,500 hospital deaths and saved \$7.7 billion.

The NQF Patient Safety Standing Committee oversees the NQF Patient Safety portfolio, evaluating both novel and existing quality performance measures for NQF endorsement. Measures in the Patient Safety portfolio target various aspects of patient safety across healthcare settings. In this review cycle, measures span hospital and nursing home settings, and are connected to important areas in patient safety, including medication reconciliation, hyperglycemia, bladder catheterization, and urinary tract infections (UTIs).

Patient safety in the hospital setting is a common target of quality reporting and payment programs, due in part to the clear impact of many clinical processes and care on outcomes. Medication review, reconciliation, and monitoring are important components of patient safety across various care settings, including the hospital. Research on medication reconciliation interventions has consistently shown improvements in reducing medication discrepancies, adverse drug events, and healthcare utilization.^{4,5} This cycle included one measure that focused on improving medication reconciliation by evaluating the number of unintentional discrepancies at hospital discharge.

Additionally, with the increasing ubiquity of electronic health records (EHRs), there has been increased interest in electronic clinical quality measures (eCQMs) that can be automatically extracted from EHRs. In this cycle, the Patient Safety Standing Committee reviewed one eCQM related to hyperglycemia. Severe hyperglycemia is associated with a range of harms, including increased in-hospital mortality, infection rates, and hospital length of stay.⁶⁻⁸ Many see eCQMs as the future of quality measurement and a key advancement in measurement science. Over the coming years, eCQMs will become increasingly important, as they reduce the burden of abstraction and can rely on more detailed clinical data.

Lastly, within the nursing home setting, measurement and reporting of quality of care has expanded in recent years, largely due to efforts by the Centers for Medicare & Medicaid Services (CMS). While some measures are relevant to both short- and long-stay nursing homes, others are specific to a specific

patient population. This cycle included two long-stay nursing home measures focusing on appropriate catheter use and UTIs, both of which have been shown to be associated with serious corollary outcomes and complications, including poor quality of life and an increase in resource utilization (e.g., hospitalization).⁹⁻¹¹

NQF Portfolio of Performance Measures for Patient Safety Conditions

The Patient Safety Standing Committee ([Appendix C](#)) oversees NQF's portfolio of Patient Safety measures ([Appendix B](#)). This portfolio contains 60 measures: 16 process measures, 37 outcome measures, one intermediate outcome measure, three structure measures, and three composite measures (see Table 1 below).

Table 1. NQF Patient Safety Portfolio of Measures

	Process	Outcome	Intermediate Outcome	Structure	Composite	Total
Medication Safety	8	1	–	–	–	9
Healthcare-Associated Infections	2	7	–	–	–	9
Perioperative Safety	–	7	–	–	–	7
Falls	1	5	–	–	–	6
Mortality	–	7	–	–	1	8
Venous Thromboembolism	–	1	–	–	–	1
Pressure Ulcers	–	3	–	–	–	3
Workforce	–	–	–	3	–	3
Radiation Safety	–	–	1	–	–	1
Other	5	6	–	–	2	13
Total	16	37	1	3	3	60

Additional measures related to patient safety are assigned to other projects. These include various diabetes assessment and screening measures (Prevention and Population Health/Behavioral Health and Substance Use projects), primary care and chronic illness measures (Primary Care and Chronic Illness project), ACEI/ARB medication measures (Cardiovascular project), complications measures (Prevention and Population Health/Surgery projects), and cost and efficiency measures (Cost and Efficiency project).

Patient Safety Measure Evaluation

On February 3 and 5, 2020 the Patient Safety Standing Committee evaluated one new measure and three measures undergoing maintenance review against NQF's [standard measure evaluation criteria](#) (Table 2).

Table 2. Patient Safety Measure Evaluation Summary

	Maintenance	New	Total
Measures under consideration	3	1	4
Measures endorsed	3	1	4
Measures withdrawn from consideration	1	0	1

Comments Received Prior to Committee Evaluation

NQF solicits comments on endorsed measures on an ongoing basis through the [Quality Positioning System \(QPS\)](#). In addition, NQF solicits comments for a continuous 16-week period during each evaluation cycle via an online tool located on the project webpage. For this evaluation cycle, the commenting period opened on November 26, 2019 and will close on April 14, 2020. As of January 21, 2020, no comments were submitted and shared with the Committee prior to the measure evaluation meetings ([Appendix F](#)).

Comments Received After Committee Evaluation

Considering the recent COVID-19 global pandemic, many organizations needed to focus their attention on the public health crisis. In order to provide greater flexibility for stakeholders and continue the important work in quality measurement, the National Quality Forum (NQF) extended commenting periods and adjusted measure endorsement timelines for the Fall 2019 cycle.

Commenting periods for all measures evaluated in the Fall 2019 cycle were extended from 30 days to 60 days. Based on the comments received during this 60-day extended commenting period, measures entered one of two tracks:

Track 1: Measures Continuing in Fall 2019 Cycle

Measures that did not receive public comments or only received comments in support of the Standing Committees' recommendations will move forward to the CSAC for review and discussion during its meeting on July 28-29.

- **Exceptions**

Exceptions were granted to measures if non-supportive comments received during the extended post-comment period were similar to those received during the pre-evaluation meeting period and have already been adjudicated by the respective Standing Committees during the measure evaluation Fall 2019 meetings.

Track 2: Measures Deferred to Spring 2020 Cycle

Fall 2019 measures requiring further action or discussion from a Standing Committee were deferred to the Spring 2020 cycle. This includes measures where consensus was not reached or those that require a response to public comments received. Measures undergoing maintenance review will retain endorsement during that time.

During the Fall 2019 CSAC meeting on July 28-29, the Consensus Standards Approval Committee (CSAC) will review all measures assigned to Track 1. A list of measures assigned to Track 2 can be found in the

[Executive Summary section](#) of this report for tracking purposes, but these measures will be reviewed by CSAC on November 17 and 18, 2020.

The extended public commenting period with NQF member support closed on May 14, 2020. Following the Committee's evaluation of the measures under consideration, NQF did not receive any comments from organizations and/or individuals pertaining to the draft report and to the measures under consideration. All comments for each measure under consideration have been summarized in [Appendix A](#).

Throughout the extended public commenting period, NQF members had the opportunity to express their support ('support' or 'do not support') for each measure submitted for endorsement consideration to inform the Committee's recommendations. No NQF members provided their expression of support.

Overarching Issues

During the Standing Committee's discussion of the measures, several overarching issues emerged that factored into the Committee's ratings and recommendations for multiple measures and are not repeated in detail with each individual measure.

The Importance of Appropriate Risk Adjustment

The Committee discussed risk adjustment for two measures: *0684 Percent of Residents with a Urinary Tract Infection (Long Stay)* and *0686 Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long Stay)*. Because the underlying risk of an outcome in populations may differ, it is vital to account for that variation in performance measurement. In particular, patient factors such as comorbid conditions can increase the risk of a condition—such as a UTI—as well as community prevalence of the disease. While there was robust discussion of the importance of risk adjustment for these measures, the Committee was satisfied that appropriate risk adjustment had been applied to the measures reviewed in this cycle.

Measure Feasibility

Ensuring that additional burdens are not placed on clinicians for measurement purposes is an important consideration. The Committee agreed that the Minimum Data Set 3.0 is a feasible source of data for measures *0684 Percent of Residents with a Urinary Tract Infection (Long Stay)* and *0686 Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long Stay)* and contains data that are collected in the regular delivery of care within nursing home facilities. The Committee also discussed that *2456 Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient* and *3533e Hospital Harm – Severe Hyperglycemia* are both measures that are generated using data from EHRs, which is an important step in improving the feasibility of performance measures and reducing the burden of data collection on providers.

The Definition of Public Reporting

There was Committee discussion on the definition of public reporting; in particular, when a measure is used within a public reporting program but the actual results of the measure (i.e., measure rate) are not actually reported to the public.

Summary of Measure Evaluation: Fall 2019 Measures, Track 1

The following brief summaries of the measure evaluation highlight the major issues that the Committee considered. Details of the Committee's discussion and ratings of the criteria for each measure are included in [Appendix A](#).

Subtopic Area

0684 Percent of Residents with a Urinary Tract Infection (Long Stay) (Centers for Medicare & Medicaid Services): Endorsed

Description: This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care. **Measure Type:** Outcome; **Level of Analysis:** Facility; **Setting of Care:** Post-Acute Care; **Data Source:** Assessment Data

The Standing Committee recommended the measure for continued endorsement. This measure was originally endorsed in 2011 and went through maintenance in 2014. The developer also convened a technical expert panel (TEP) in 2019 to review this measure. This is an outcome measure; therefore, the Committee discussed whether there were one or more actions that could be done to reduce the incidence of UTIs in long-stay patients. While it was recognized that there is substantial literature to demonstrate that catheter-associated urinary tract infections are preventable, there was discussion whether similar studies had been conducted in nursing home patients. The developer responded that there are several evidence-based ways to reduce UTIs in nursing homes, including hand hygiene, reducing catheter use, comprehensive infection control programs, and staff training. In particular, practices that are implemented as bundles were associated with lower infection rates.

There was also discussion about how a UTI is defined in the MDS 3.0. The developer responded that evidence-based microbiological criteria is used to determine whether a patient had a UTI as well as being diagnosed by a physician. There were also concerns that other factors may contribute to differences in rates such as the community prevalence of disease. The developer described some feedback from the TEP that some factors, particularly functional status or hospice status, could be considered as risk adjustors. The developer described that potential risk adjustors identified by the TEP were tested, and these were not clearly related to measures performance, and were not included in the risk adjustment model.

The Committee discussed that there was improved (i.e., downward) performance on the measure in recent years over time. However, a gap still exists, and the measure had not yet topped out. The Committee also discussed the feasibility of this measure; in particular, whether there was additional burden in filling out the MDS. The developer clarified that the MDS is gathered in the regular course of care for a variety of purposes; therefore, it did not add additional burden to nursing facilities.

0686 Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long Stay) (Centers for Medicare & Medicaid Services): Endorsed

Description: This measure reports the percentage of low-risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care. **Measure Type:** Outcome; **Level of Analysis:** Facility; **Setting of Care:** Post-Acute Care; **Data Source:** Assessment Data

The Standing Committee recommended the measure for continued endorsement. This measure was last endorsed in 2011. In the Committee discussion, there were several questions for the developers from the Committee on risk adjustment—specifically how bowel incontinence and pressure ulcers are used in the statistical model, and how that was determined. The developer described that it was a combination of clinical and empirical analysis that drove the selection of the risk adjustment variables. Clinical factors were chosen based on input from a TEP that was convened by the developer in 2019. There was discussion by the Committee about the importance of continued measurement by nursing homes given the impact on quality of life—as well as the risk of UTIs—in long-term nursing home residents. The Committee also agreed that there was a significant performance gap that justified continued endorsement, despite having been in use for a long time. The Committee agreed that the developer addressed concerns on reliability and validity, notably the exclusions as well as the risk adjustment methodology. There was also discussion that this measure (similar to *0684 Percent of Residents with a Urinary Tract Infection (Long Stay)*) is an MDS 3.0 measure, but there were no concerns about feasibility. The Committee also had no concerns about the Use and Usability measure criterion given this measure is publicly reported and used in accountability programs.

2456 Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient (Brigham and Women's Hospital): Endorsed

Description: This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period. At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by a trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization. **Measure Type:** Outcome; **Level of Analysis:** Facility; **Setting of Care:** Inpatient/Hospital; **Data Source:** Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records

The Standing Committee recommended the measure for continued endorsement. The developer introduced the measure focusing on validity, since the NQF Scientific Methods Panel (SMP) did not reach consensus on this criterion during its review of this measure. The developer noted that the measure is risk-adjusted for the number of gold standard medications, and that even though there is a preference

for electronic quality measures, the developer commented that manual chart review is the only way to target medication reconciliation quality. The developer noted that the measure has been used in several research studies, which have been published in what the developer considers top-tier journals. Lastly, the developer described that when hospitals take steps to improve medication reconciliation, the metric improves. The Committee agreed on the importance of preventing medication discrepancies, and there is evidence to support that mitigating medication discrepancies can improve outcomes. The Committee unanimously upheld the SMP's review of the measure reliability. For validity, the Committee was satisfied with the developer's explanation of the validity of this measure. However, the Committee did seek clarification on changes made to the numerator. Specifically, the measure originally looked at the number of medications per patient. The developer explained that the change to the measure was to show the number of discrepancies per medications, such that the measure captures the number of opportunities for error. For feasibility, the developer noted that the measure is used in over 1,400 hospitals. The Committee sought input on who is conducting the medication reconciliation. The developer stated that the medication reconciliation data should be provided by a trained pharmacist.

There also was discussion by the Committee on public reporting of this measure. The measure is currently used within a LeapFrog program; however, the actual measure rate is not reported to the public. Rather, what is publicly reported within the LeapFrog program is whether or not a hospital has reported on the measure (i.e., provided the appropriate data for the measure). Committee members felt that reporting on the measure constitutes public reporting. The Committee ultimately passed the measure on Use and Usability.

3533e Hospital Harm – Severe Hyperglycemia (Centers for Medicare & Medicaid Services): Endorsed

Description: This ratio electronic clinical quality measure (eCQM) assesses the number of hospital days with a severe hyperglycemic event (a blood glucose result >300 mg/dL, or a day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL) per the total qualifying hospital days among inpatient encounters for patients 18 years and older who have either:

1. A diagnosis of diabetes mellitus,
2. Received at least one administration of insulin or an antidiabetic medication during the hospital admission; or
3. Had an elevated blood glucose level (>200 mg/dL) during their hospital admission. **Measure Type:** Outcome; **Level of Analysis:** Facility; **Setting of Care:** Inpatient/Hospital; **Data Source:** Electronic Health Records

The Standing Committee recommended the measure for NQF endorsement. This is a new eCQM. It is an outcome measure at the facility level of analysis. The developer submitted evidence indicating severe hyperglycemia can be reduced through optimizing glucose management in hospitalized patients. The Committee had no concerns with the evidence, and agreed that the evidence supported the importance of this measure. The Committee also had no concerns with the performance gap. The developer provided the rate of severe hyperglycemic events across six hospitals. The rate of severe hyperglycemic events varied across the hospitals, which suggests opportunities for improvement in glycemic management.

The Committee also had no concerns with the scientific acceptability criteria of the measure. The SMP reviewed and passed the measure with a high rating for both reliability and validity. One Committee member noted the thresholds for hyperglycemia in the measure were appropriate. There is no risk adjustment currently of the measure. However, a Committee member suggested that once the measure is implemented in a public reporting program, risk adjustment of the measure could be readdressed when the measure goes through maintenance review.

One Committee member inquired if the measure captures both a point-of-care glucose test and a lab glucose test. The developer responded that both are in the value set of the measure and acceptable, as long as it is in a standardized structured field from the EHR. The Committee member also inquired if the measure accurately captures data from two separate structured fields, elaborating the laboratory structure field and the bedside care structured field (i.e., nurse flowsheet-where a point-of-care glucose test would be documented). The developer, as well as other Committee members, confirmed that point-of-care glucose tests are uploaded to the EHR and were not concerned about that value being captured. However, the Committee recommends that the developer verify this information with EHR vendors, to confirm no underlying feasibility issues of this measure.

The measure is currently not in use in a public reporting and/or accountability program but is being considered for CMS federal programs. The Committee discussed a complementary measure, *3503e - Hospital Harm – Severe Hypoglycemia*, which was endorsed in the Spring 2019 cycle by this Committee. The developer noted 3533e and 3503e are individually being proposed to ensure each measure is reliable and valid. In the future, there could be potential of developing a composite measure with these two measures. One Committee member noted that, although the measures align, they each stand alone well.

Measures Withdrawn from Consideration

One measure previously endorsed by NQF has not been resubmitted for maintenance of endorsement. Endorsement for this measure will be removed.

Table 3. Measures Withdrawn from Consideration

Measure	Reason for withdrawal
0513 Thorax CT—Use of Contrast Material	Developer is not seeking re-endorsement.

References

- 1 Kohn LT, Corrigan J, Donaldson MS, et al. *To Err Is Human: Building a Safer Health System*. Vol 6. National Academy Press Washington, DC; 2000.
- 2 Current HAI Progress Report | CDC. <https://www.cdc.gov/hai/data/portal/progress-report.html>. Published December 4, 2019. Last accessed February 2020.
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- 4 Mueller SK, Sponsler KC, Kripalani S, et al. Hospital-based medication reconciliation practices: a systematic review. *Arch Intern Med*. 2012;172(14):1057-1069.
- 5 Schnipper JL, Mixon A, Stein J, et al. Effects of a multifaceted medication reconciliation quality improvement intervention on patient safety: final results of the MARQUIS study. *BMJ Qual Saf*. 2018;27(12):954-964.
- 6 Pasquel FJ, Spiegelman R, McCauley M, et al. Hyperglycemia during total parenteral nutrition: an important marker of poor outcome and mortality in hospitalized patients. *Diabetes Care*. 2010;33(4):739-741.
- 7 Lee LJ, Emons MF, Martin SA, et al. Association of blood glucose levels with in-hospital mortality and 30-day readmission in patients undergoing invasive cardiovascular surgery. *Curr Med Res Opin*. 2012;28(10):1657-1665.
- 8 King JT, Goulet JL, Perkal MF, et al. Glycemic control and infections in patients with diabetes undergoing noncardiac surgery. *Ann Surg*. 2011;253(1):158-165.
- 9 Castle N, Engberg JB, Wagner LM, et al. Resident and Facility Factors Associated With the Incidence of Urinary Tract Infections Identified in the Nursing Home Minimum Data Set. *J Appl Gerontol Off J South Gerontol Soc*. 2017;36(2):173-194.
- 10 An Innovative Quality Assurance Activity to Reduce Urinary Tract Infection Rates in a Green House Skilled Nursing Setting. Population Health Learning Network. <https://www.managedhealthcareconnect.com/articles/innovative-quality-assurance-activity-reduce-urinary-tract-infection-rates-green-house>. Last accessed February 2020.
- 11 Hu F-W, Yang D-C, Huang C-C, et al. Inappropriate use of urinary catheters among hospitalized elderly patients: Clinician awareness is key. *Geriatr Gerontol Int*. 2015;15(12):1235-1241.

Appendix A: Details of Measure Evaluation

Rating Scale: H=High; M=Moderate; L=Low; I=Insufficient; NA=Not Applicable

Track 1 – Endorsed Measures

<p>0684 Percent of Residents with a Urinary Tract Infection (Long Stay)</p>
<p>Submission Specifications</p>
<p>Description: This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.</p> <p>Numerator Statement: The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.</p> <p>Denominator Statement: The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.</p> <p>Exclusions: If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.</p> <p>Adjustment/Stratification: No risk adjustment or risk stratification</p> <p>Level of Analysis: Facility</p> <p>Setting of Care: Post-Acute Care</p> <p>Type of Measure: Outcome</p> <p>Data Source: Assessment Data</p> <p>Measure Steward: Centers for Medicare & Medicaid Services</p>
<p>STANDING COMMITTEE MEETING 02/03/2020</p> <p>1. Importance to Measure and Report: <u>The measure meets the Importance criteria</u> (1a. Evidence, 1b. Performance Gap) 1a. Evidence: Pass-18; No Pass-0 1b. Performance Gap: H-2; M-16; L-0; I-0 Rationale:</p> <ul style="list-style-type: none"> • UTIs in long-stay facilities were seen to be an important outcome measure by the Committee. • The Committee agreed that there were more healthcare actions that could be taken to reduce the incidence of UTIs in long-stay facilities; in particular, hand hygiene, treating atrophic vaginitis, implementing infection control, and improving the management of urinary incontinence. • The developer demonstrated a persistent performance gap for this measure.
<p>2. Scientific Acceptability of Measure Properties: <u>The measure meets the Scientific Acceptability criteria</u> (2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity) Do you accept the Scientific Method Panel's Moderate rating for Reliability? Yes-17; No-1 Do you accept the Scientific Method Panel's Moderate rating for Validity? Yes-18; No-1</p> <ul style="list-style-type: none"> • This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel. • The NQF Scientific Methods Panel's ratings for Reliability: H-0; M-5; L-1; I-0 • The NQF Scientific Methods Panel's ratings for Validity: H-1; M-3; L-1; I-1 • The Standing Committee voted to accept the NQF Scientific Methods Panel's moderate rating of reliability and validity.

<p><u>Rationale:</u></p> <ul style="list-style-type: none"> • The developer demonstrated reliability and validity of the measure in their submission. • The Committee accepted the evaluation of the NQF Scientific Methods Panel for reliability and validity, and agreed that the information provided by the developer was sufficient.
<p>3. Feasibility: H-8; M-10; L-0; I-0 <i>(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/unintended consequences identified; 3d. Data collection strategy can be implemented)</i></p> <p><u>Rationale:</u></p> <ul style="list-style-type: none"> • All the data necessary to calculate this measure are found within MDS 3.0, which is collected by all Medicare-approved nursing homes.
<p>4. Use and Usability <i>4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)</i></p> <p>4a. Use: Pass-18; No Pass-0 4b. Usability: H-4; M-14; L-0; I-0</p> <p><u>Rationale:</u></p> <ul style="list-style-type: none"> • This quality measure (NQF #0684) is part of the Nursing Home Quality Initiative (NHQI). • All Medicare- and/or Medicaid-certified nursing home providers may view their performance results for this and other NHQI measures via the Certification and Survey Provider Enhanced Reports (CASPER) system.
<p>5. Related and Competing Measures</p> <ul style="list-style-type: none"> • This measure is related to the following measures: <ul style="list-style-type: none"> ○ NQF 0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure ○ NQF 0281: Urinary Tract Infection Admission Rate (PQI 12)
<p>6. Standing Committee Recommendation for Endorsement: Y-18; N-0</p>
<p>7. Public and Member Comment</p> <ul style="list-style-type: none"> • No comments received
<p>8. Consensus Standards Approval Committee (CSAC) Vote (July 28, 2020): Y-10; N-0; A-0 Decision: Approved for continued endorsement</p>
<p>9. Appeals No appeals were received</p>

0686 Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long Stay)

[Submission](#) | [Specifications](#)

Description: This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

Numerator Statement: The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.

Denominator Statement: The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.

Exclusions: The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.

Adjustment/Stratification: Yes

Level of Analysis: Facility

Setting of Care: Post-Acute Care

Type of Measure: Outcome

Data Source: Assessment Data

Measure Steward: Centers for Medicare & Medicaid Services

STANDING COMMITTEE MEETING 02/03/2020

1. Importance to Measure and Report: The measure meets the Importance criteria

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **H-0; M-17; L-1; I-0**; 1b. Performance Gap: **H-2; M-16; L-0; I-0**

Rationale:

- The developer provided a logic model linking nursing home structure to the process of placement of a urinary catheter.
- There is evidence that longer-term catheter use is associated with higher rates of catheter-associated urinary tract infections (CAUTIs), an outcome that is associated with significant morbidity and mortality.
- The developer provided general guidelines that suggest with good evidence (category 1B: A strong recommendation supported by low quality evidence suggesting net clinical benefits or harms or an accepted practice [e.g., aseptic technique] supported by low to very low quality evidence) that urinary catheters should only be used when absolutely needed, and that they should not be routinely used in nursing homes (the setting of this measure), or during operative procedures routinely, and that when they are needed, their use should be minimized.
- The developer provided data to suggest there is a measurement gap across nursing homes for this measure.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity)

2a. Reliability: **H-0; M-18; L-0; I-0**; 2b. Validity: **H-2; M-16; L-0; I-0**

Rationale:

<ul style="list-style-type: none"> • The developer demonstrated sufficient critical data element reliability and performance score reliability. • The developer demonstrated correlation with measure 0684 (an outcome measure) and conducted several assessments of validity at the state and seasonal level, and that the data were stable and that confidence intervals were appropriate. • The developer conducted a TEP that affirmed the face validity of this measure.
<p>3. Feasibility: Pass-18; No Pass-0 <i>(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/unintended consequences identified; 3d. Data collection strategy can be implemented)</i> <u>Rationale:</u></p> <ul style="list-style-type: none"> • These data are regularly collected in electronic format as part of the MDS 3.0 in all Medicare-approved nursing homes.
<p>4. Use and Usability <i>4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)</i></p> <ul style="list-style-type: none"> • 4a. Use: Pass-18; No Pass-0 4b. Usability: H-7; M-11; L-0; I-0 <p><u>Rationale:</u></p> <ul style="list-style-type: none"> • This quality measure (NQF #0686) is part of the Nursing Home Quality Initiative (NHQI). • Information on this measure is available to nursing home providers and the public. • All United States Medicare- and/or Medicaid-certified nursing home providers may view their performance results for this and other NHQI measures via the Certification and Survey Provider Enhanced Reports (CASPER) system.
<p>5. Related and Competing Measures This measure is related to the following measures:</p> <ul style="list-style-type: none"> • 0138 National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure (Centers for Disease Control and Prevention) • 0684 Percent of Residents with a Urinary Tract Infection (Long-Stay) (CMS/Acumen)
<p>6. Standing Committee Recommendation for Endorsement: Y-18; N-0</p>
<p>7. Public and Member Comment</p> <ul style="list-style-type: none"> • No comments received
<p>8. Consensus Standards Approval Committee (CSAC) Vote (July 28, 2020): Y-10; N-0 Decision: Approved for continued endorsement</p>
<p>9. Appeals No appeals were received</p>

2456 Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

[Submission](#) | [Specifications](#)

Description: This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period. At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

Numerator Statement: For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

Denominator Statement: The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

Exclusions: Patients that are discharged or expire before a gold standard medication list can be obtained.

Adjustment/Stratification: No risk adjustment or risk stratification

Level of Analysis: Facility

Setting of Care: Inpatient/Hospital

Type of Measure: Outcome

Data Source: Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records

Measure Steward: Brigham and Women's Hospital

STANDING COMMITTEE MEETING 02/03/2020

1. Importance to Measure and Report: The measure meets the Importance criteria

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Pass-19; No Pass-1** 1b. Performance Gap: **H-10; M-10; L-0; I-0**

Rationale:

- The developer noted that the measure has been used in several research studies, which have been published in what the developer considers top-tier journals.
- The developer also commented that when hospitals take steps to improve medication reconciliation, the metric improves.
- The Committee agreed on the importance of preventing medication discrepancies and that there is evidence to support that mitigating medication discrepancies can improve outcomes.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity)

Do you accept the Scientific Method Panel's Moderate rating for Reliability? **Yes-20; No-0**

Validity: **H-0; M-16; L-4; I-0**

- This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel (SMP).
- The NQF Scientific Methods Panel's ratings for Reliability: **H-0; M-5; L-1; I-0**
- The NQF Scientific Methods Panel's ratings for Validity: **H-0; M-3; L-2; I-1** (Consensus not reached).

- The Standing Committee voted to accept the NQF Scientific Methods Panel's Moderate rating of reliability.
- The Standing Committee voted on this measure for Validity.

Rationale:

- The Committee unanimously upheld the SMP's review of the measure reliability.
- For validity, the Committee did not raise any question or concerns.
- The developer noted that the measure is risk-adjusted for the number of gold standard medications, and that even though there is a preference for electronic quality measures, the developer commented that manual chart review is the only way to target medication reconciliation quality.
- The Committee did seek clarification on changes to the numerator. Specifically, the measure originally looked at the number of medications per patient.
- The developer explained that the change to the measure was to show the number of discrepancies per medications, such that the measure captures the number of opportunities for error.

3. Feasibility: H-1; M-17; L-2; I-0

(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/unintended consequences identified; 3d. Data collection strategy can be implemented)

Rationale:

- For feasibility, the developer noted that the measure is used within over 1,400 hospitals.
- The Committee sought input on who is conducting the medication reconciliation.
- The developer stated that the medication reconciliation data should be provided by a trained pharmacist.

4. Use and Usability

4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)

4a. Use: **Pass-12; No Pass-6** 4b. Usability: **H-1; M-14; L-4; I-0**

Rationale:

- The measure is currently used within a LeapFrog program in which the measure rate is not reported.
- Rather, what is publicly reported within the LeapFrog program is whether or not a hospital has reported on the measure (i.e., provided the appropriate data for the measure).
- Committee members felt that reporting on the measure constitutes public reporting.
- The Committee ultimately passed the measure on Use and Usability.

5. Related and Competing Measures

- This measure is related to the following measures:
 - NQF 0097: Medication Reconciliation Post-Discharge
 - NQF 2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
 - NQF 0419e: Documentation of Current Medications in the Medical Record
 - NQF 0553: Care for Older Adults (COA) Medication Review
 - NQF 3317: Medication Reconciliation on Admission
- This measure is different than the other medication reconciliation/review measures since it focuses on the results of the process and goes beyond documentation.
- NQF has been engaged in an effort to further harmonize these measures and make them complementary to one another. The developer notes their willingness to be involved in these efforts.

6. Standing Committee Recommendation for Endorsement: Y-15; N-4

<p>7. Public and Member Comment</p> <ul style="list-style-type: none"> No comments received
<p>8. Consensus Standards Approval Committee (CSAC) Vote (July 28, 2020): Y-10; N-0</p> <p>Decision: Approved for continued endorsement</p>
<p>9. Appeals</p> <p>No appeals were received</p>

<p>3533e Hospital Harm – Severe Hyperglycemia</p>
<p>Submission Specifications</p>
<p>Description: This ratio electronic clinical quality measure (eCQM) assesses the number of hospital days with a severe hyperglycemic event (a blood glucose result >300 mg/dL, or a day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is >=200 mg/dL) per the total qualifying hospital days among inpatient encounters for patients 18 years and older who have either:</p> <ol style="list-style-type: none"> 1. A diagnosis of diabetes mellitus, 2. Received at least one administration of insulin or an anti-diabetic medication during the hospital admission, or 3. Had an elevated blood glucose level (>200 mg/dL) during their hospital admission. <p>Numerator Statement: The total number of hyperglycemic days across all encounters divided by the total number of eligible days across all encounters. Hospital days are measured in 24-hour periods, starting from the time of arrival at the hospital (including Emergency Department). Days with a hyperglycemic event are defined as:</p> <ul style="list-style-type: none"> - A day with at least one blood glucose value >300 mg/dL; or - A day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is >=200 mg/dL. <p>We do not count >300 mg/DL events the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before discharge, if it was less than 24 hours.</p> <p>Denominator Statement: The initial population is all patients 18 years and older at the start of the measurement period with a discharged inpatient hospital admission during the measurement period, as well as either:</p> <ol style="list-style-type: none"> 1. A diagnosis of diabetes that starts before or during the encounter; or 2. Administration of at least one dose of insulin or any anti-diabetic medication during the encounter; or 3. Presence of at least one blood glucose value >200 mg/dL at any time during the encounter. <p>The eCQM includes inpatient encounters which began in the Emergency Department or in observation status. The denominator is the total number of eligible days across all encounters which match the initial population criteria. We do not count the the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before the discharge, if it was less than 24 hours. By excluding the first 24 hours of admission, we allow for correction of severe hyperglycemia that was present on admission. By excluding the last time period before discharge if it was less than 24 hours, we account for the fact that hospitals may not always be able to check glucose during the last time period, especially if it is only a few hours long. Eligible encounters that exceed 10 days are truncated to equal 10 days.</p> <p>Exclusions: N/A; there are no denominator exclusions.</p> <p>Adjustment/Stratification: There is no risk adjustment</p> <p>Level of Analysis: Facility</p>

3533e Hospital Harm – Severe Hyperglycemia**Setting of Care:** Inpatient/Hospital**Type of Measure:** Outcome**Data Source:** Electronic Health Records**Measure Steward:** Centers for Medicare & Medicaid Services (CMS)**STANDING COMMITTEE MEETING 02/03/2020****1. Importance to Measure and Report: The measure meets the Importance criteria**

(1a. Evidence, 1b. Performance Gap)

1a. Evidence: **Pass-18; No Pass-0**; 1b. Performance Gap: **H-4; M-14; L-0; I-0****Rationale:**

- The goal of the Severe Hyperglycemia eQIM is to improve patient safety and prevent severe hyperglycemia in patients who are at risk.
- The focus of this outcome measure is inpatient hyperglycemia. The purpose of measuring hyperglycemic events is to reduce the frequency of these adverse patient outcomes and to improve hospitals' practices for appropriate dosing of medication and adequate monitoring of patients receiving glycemic control agents.
- The Committee agreed that rates of inpatient hyperglycemic events can be reduced with high quality care provided by a hospital, and that severe hyperglycemic events are largely avoidable by careful use of antihyperglycemic medications, monitoring of patient blood glucose levels, enhanced use of technology, and implementation of evidence-based best practices.
- This eQIM was tested in seven hospitals in four regions (West, Midwest, Southeast, South). Hospitals varied in size (100-799 beds) and EHR systems (Cerner, Meditech, Epic).
- Performance rates on this measure ranged from 8.2%-19.5% in six hospitals. No performance rate for hospital seven was calculated due to inability to map point-of-care glucose lab data at time of testing.
- The Committee agreed there was variation in performance across the six hospitals tested.

2. Scientific Acceptability of Measure Properties: The measure meets the Scientific Acceptability criteria

(2a. Reliability - precise specifications, testing; 2b. Validity - testing, threats to validity)

2a. Reliability: **Yes-18; No-0** 2b. Validity: **Yes-18; No-0**

- This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel.
- The NQF Scientific Methods Panel's ratings for Reliability: **H-6; M-0; L-0; I-0**
- The NQF Scientific Methods Panel's ratings for Validity: **H-4; M-1; L-0; I-1**
- The Standing Committee voted to accept NQF Scientific Methods Panel's high rating of reliability and validity.

Rationale:

- This measure was deemed as complex and was evaluated by the NQF Scientific Methods Panel, which passed the measure. The Standing Committee accepted the NQF Scientific Methods Panel decision, unanimously.
- Reliability testing was done at the performance score level across six hospitals. There were 5,501 eligible encounters (and 19,736 eligible days) across Hospitals one through six. The signal-to-noise ratio yielded a median reliability score of 0.967 (range: 0.955-0.983).
- Data element validity was assessed by evaluating the accuracy of electronically extracted EHR data elements compared with manual-chart-abstracted data elements from the same patients, which is considered the gold standard for these analyses. In addition, validity testing at the performance measure score level was conducted, which assessed whether the harm rate calculated for each facility is accurate. Finally, face validity was assessed by a TEP.

<p>3533e Hospital Harm – Severe Hyperglycemia</p> <ul style="list-style-type: none"> The Committee agreed the measure was valid and addressed appropriate thresholds for hyperglycemia. The Committee commented that they would like to see risk adjustment readdressed in the future, once the measure is implemented in a public reporting program.
<p>3. Feasibility: H-8; M-10; L-0; I-0 <i>(3a. Clinical data generated during care delivery; 3b. Electronic sources; 3c. Susceptibility to inaccuracies/unintended consequences identified; 3d. Data collection strategy can be implemented)</i> Rationale:</p> <ul style="list-style-type: none"> The measure is generated or collected by and used by healthcare personnel during the provision of care (e.g., blood pressure, lab value, diagnosis, depression score). This measure is an eCQM. All value sets used in measure submission are accessible via the Value Set Authority Center. Submission includes simulated data set results demonstrating unit testing covering 100% of the measure logic. The Committee also discussed this measure’s eCQM feasibility and had one concern. The Committee discussed if the measure accurately captures data from two separate structured fields, elaborating the laboratory structure field and the bedside care structured field (i.e., nurse flowsheet, where a point-of-care glucose test would be documented). The developer confirmed the measure would capture both laboratory and bedside care structured fields. However, one Committee member recommended the developer verify this information with the EHR vendors, to confirm no underlying feasibility issues of this measure.
<p>4. Use and Usability <i>4a. Use; 4a1. Accountability and transparency; 4a2. Feedback on the measure by those being measured and others; 4b. Usability; 4b1. Improvement; 4b2. The benefits to patients outweigh evidence of unintended negative consequences to patients)</i> 4a. Use: Pass-18; No Pass-0 4b. Usability: H-7; M-11; L-0; I-0 Rationale:</p> <ul style="list-style-type: none"> The measure is not currently in use. This measure is being developed for the Hospital Inpatient Quality Reporting (HIQR) and the Promoting Interoperability (PI) for Eligible Hospitals and Critical Access Hospitals programs pending NQF endorsement, Measure Application Partnership (MAP) prerulemaking evaluation, and the CMS rulemaking process. The MAP, in December 2019, recommended this measure for conditional support for rulemaking, pending NQF endorsement.
<p>5. Related and Competing Measures</p> <ul style="list-style-type: none"> This measure is related to the following measure: <ul style="list-style-type: none"> NQF# 3503e Hospital Harm – Severe Hypoglycemia (CMS/IMPAQ International)
<p>6. Standing Committee Recommendation for Endorsement: Y-18; N-0</p>
<p>7. Public and Member Comment</p> <ul style="list-style-type: none"> No comments received
<p>8. Consensus Standards Approval Committee (CSAC) Vote(July 28, 2020): Y-9; N-0 Decision: Approved for endorsement</p>
<p>9. Appeals No appeals were received</p>

Appendix B: Patient Safety Portfolio—Use in Federal Programs^a

NQF#	Title	Federal Programs: Finalized or Implemented
0022	Use of High-Risk Medications in the Elderly (DAE)	Merit-Based Incentive Payment System (MIPS) Program (Implemented)
0097	Medication Reconciliation Post-Discharge	Medicare Part C Star Rating (Implemented) Physician Compare (Implemented) MIPS Program (Implemented)
0101	Falls: Screening, Risk-Assessment, and Plan of Care to Prevent Future Falls	Medicare Shared Savings Program (MSSP) (Implemented) MIPS Program (Implemented)
0138	National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure	Hospital Acquired Condition Reduction Program (HACRP) (Implemented) Hospital Compare (HC) (Implemented) Hospital Inpatient Quality Reporting (Implemented) Inpatient Rehabilitation Facility (IRF) Quality Reporting (Implemented) Long-Term Care Hospital (LTCH) Quality Reporting (Implemented)
0139	National Healthcare Safety Network (NHSN) Central line-associated Bloodstream Infection (CLABSI) Outcome Measure	HACRP (Implemented) HC (Implemented) Hospital IQR (Implemented) LTCH Quality Reporting (Implemented) Long-Term Care Hospital (LTCH) Compare (Implemented)
0141	Patient Fall Rate	None
0202	Falls with injury	None
0204	Skill mix (Registered Nurse [RN], Licensed Vocational/Practical Nurse [LVN/LPN], unlicensed assistive personnel [UAP], and contract)	None
0205	Nursing Hours per Patient Day	None
0206	Practice Environment Scale - Nursing Work Index (PES-NWI) (composite and five subscales)	None
0231	Pneumonia Mortality Rate (IQI #20)	None
0337	Pressure Ulcer Rate (PDI 2)	None
0344	Accidental Puncture or Laceration Rate (PDI #1)	None

^a Per CMS Measures Inventory Tool as of 02/25/2020

0345	Unrecognized Abdominopelvic Accidental Puncture or Laceration Rate (PSI15)	HC (Implemented)
0346	Iatrogenic Pneumothorax Rate (PSI 6)	None
0347	Death Rate in Low-Mortality Diagnosis Related Groups (PSI02)	None
0348	Iatrogenic Pneumothorax Rate (PDI 5)	None
0349	Transfusion Reaction Count (PSI 16)	None
0350	Transfusion Reaction Count (PDI 13)	None
0352	Failure to Rescue In-Hospital Mortality (risk adjusted)	None
0353	Failure to Rescue 30-Day Mortality (risk adjusted)	None
0362	Retained Surgical Item or Unretrieved Device Fragment Count (PDI 03)	None
0363	Retained Surgical Item or Unretrieved Device Fragment Count (PSI 05)	None
0419	Documentation of Current Medications in the Medical Record	MIPS Program (Implemented)
0419e	Documentation of Current Medications in the Medical Record	MIPS Program (Implemented) Medicaid Promoting Interoperability Program for Eligible Professionals (Implemented)
0450	Perioperative Pulmonary Embolism or Deep Vein Thrombosis Rate (PSI 12)	HC (Implemented)
0468	Hospital 30-day, all-cause, risk-standardized mortality rate (RSMR) following pneumonia hospitalization	None
0500	Severe Sepsis and Septic Shock: Management Bundle	HC (Implemented) Hospital IQR (Implemented)
0530	Mortality for Selected Conditions	None
0531	Patient Safety and Adverse Events Composite	HC (Implemented)
0553	Care for Older Adults (COA) – Medication Review	Medicare Part C Star Rating (Implemented)
0555	INR Monitoring for Individuals on Warfarin	None
0674	Percent of Residents Experiencing One or More Falls with Major Injury (Long Stay)	Home Health Compare (Implemented) Nursing Home Compare (Implemented) Nursing Home Quality Initiative (NHQI) (Implemented)
0679	Percent of High Risk Residents with Pressure Ulcers (Long Stay)	NHQI (Implemented)
0684	Percent of Residents with a Urinary Tract Infection (Long-Stay)	Nursing Home Compare (Implemented) NHQI (Implemented)

0686	Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)	Nursing Home Compare (Implemented) NHQI (Implemented)
0687	Percent of Residents Who Were Physically Restrained (Long Stay)	Nursing Home Compare (Implemented) NHQI (Implemented)
0689	Percent of Residents Who Lose Too Much Weight (Long-Stay)	Nursing Home Compare (Implemented) NHQI (Implemented)
0753	American College of Surgeons – Centers for Disease Control and Prevention (ACS-CDC) Harmonized Procedure Specific Surgical Site Infection (SSI) Outcome Measure	HC (Implemented) Hospital Value-Based Purchasing (VBP) (Implemented)
1716	National Healthcare Safety Network (NHSN) Facility-wide Inpatient Hospital-onset Methicillin-resistant Staphylococcus aureus (MRSA) Bacteremia Outcome Measure	HACRP (Implemented) HC(Implemented) Hospital IQR (Implemented) Hospital (VBP) (Implemented) Prospective Payment System (PPS)-Exempt Cancer Hospital Quality Reporting (Implemented) Inpatient Rehabilitation Facility Compare (Implemented) Long-Term Care Hospital (LTCH) Compare (Implemented)
1717	National Healthcare Safety Network (NHSN) Facility-wide Inpatient Hospital-onset Clostridium difficile Infection (CDI) Outcome Measure	HACRP (Implemented) HC (Implemented) Hospital IQR (Implemented) Hospital (VBP) (Implemented) IRF Quality Reporting (Implemented) LTCH Quality Reporting (Implemented) PPS-Exempt Cancer Hospital Quality Reporting (Implemented) Inpatient Rehabilitation Facility Compare (Implemented) LTCH Compare (Implemented)
1893	Hospital 30-Day, all-cause, risk-standardized mortality rate (RSMR) following chronic obstructive pulmonary disease (COPD) hospitalization	HC (Implemented) Hospital IQR (Implemented) Hospital (VBP) (Finalized)
2065	Gastrointestinal Hemorrhage Mortality Rate (IQI #18)	None
2456	Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient	None
2720	National Healthcare Safety Network (NHSN) Antimicrobial Use Measure	None

2723	Wrong-Patient Retract-and-Reorder (Wrong Patient-RAR) Measure	None
2726	Prevention of Central Venous Catheter (CVC)-Related Bloodstream Infections	MIPS Program (Implemented)
2732e	INR Monitoring for Individuals on Warfarin after Hospital Discharge	None
2820	Pediatric Computed Tomography (CT) Radiation Dose	None
2909	Perioperative Hemorrhage or Hematoma Rate (PSI 09)	None
2940	Use of Opioids at High Dosage in Persons Without Cancer	Medicaid (Implemented)
2950	Use of Opioids from Multiple Providers in Persons Without Cancer	None
2951	Use of Opioids from Multiple Providers and at High Dosage in Persons Without Cancer	None
2988	Medication Reconciliation for Patients Receiving Care at Dialysis Facilities	End-Stage Renal Disease Quality Incentive Program (Finalized)
2993	Potentially Harmful Drug-Disease Interactions in the Elderly	None
3000	PACE-Acquired Pressure Ulcer/Injury Prevalence Rate	None
3001	PACE Participant Fall Rate	None
3003	PACE Participant Falls With Injury Rate	None
3025	Ambulatory Breast Procedure Surgical Site Infection (SSI) Outcome Measure	None
3136	GAPPS: Rate of preventable adverse events per 1,000 patient-days among pediatric inpatients	None
3215	Adult Inpatient Risk Adjusted Sepsis Mortality	None

Appendix C: Patient Safety Standing Committee and NQF Staff

STANDING COMMITTEE

Ed Septimus, MD (Co-Chair)

Professor of Internal Medicine Texas A&M Health Science Center College of Medicine, Houston, Texas, and Senior Lecturer Department of Population Medicine, Harvard Medical School
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Appendix D: Measure Specifications

0684 Percent of Residents with a Urinary Tract Infection (Long Stay)

STEWARD

Centers for Medicare & Medicaid Services

DESCRIPTION

This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

TYPE

Outcome

DATA SOURCE

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).

For MDS 3.0 item sets used to calculate the quality measure, refer to:
<http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>.

LEVEL

Facility

SETTING

Post-Acute Care

NUMERATOR STATEMENT

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.

NUMERATOR DETAILS

The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the

nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

DENOMINATOR STATEMENT

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.

DENOMINATOR DETAILS

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

EXCLUSIONS

If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.

EXCLUSION DETAILS

A resident is excluded from the denominator if:

1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]).
2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

RISK ADJUSTMENT

No risk adjustment or risk stratification

STRATIFICATION

This is not applicable; this measure is not stratified.

TYPE SCORE

Rate/proportion better quality = lower score

ALGORITHM

Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).

Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.

Step 3: Divide the results of step 2 by the results of step 1.

Step 4: Multiply the result of step 3 by 100 to obtain a percent value.

A description of the time period for the data included in this measure is provided in S.5 above.

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0686 Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long Stay)

STEWARD

Centers for Medicare & Medicaid Services

DESCRIPTION

This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

TYPE

Outcome

DATA SOURCE

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15.

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>

LEVEL

Facility

SETTING

Post-Acute Care

NUMERATOR STATEMENT

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.

NUMERATOR DETAILS

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days (H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

DENOMINATOR STATEMENT

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.

DENOMINATOR DETAILS

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01, 02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

EXCLUSIONS

The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.

EXCLUSION DETAILS

If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS readmission/return anticipated assessment (A0310B = [06]), the resident is excluded.

A resident is also excluded if any of the following conditions are true:

- 1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]).
- 2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]).
- 3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

RISK ADJUSTMENT

Statistical risk model

STRATIFICATION

This is not applicable; this measure is not stratified.

TYPE SCORE

Rate/proportion better quality = lower score

ALGORITHM

This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows:

Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.

Step 2: Calculate the facility-level observed score (steps 2a through 2b below).

Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).

Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1

Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.

Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)

Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model.

Specifically, the covariates are calculated as follows:

For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):

1. Covariate = [1] if H0400 = [2, 3];
2. Covariate = [0] if H0400 = [0, 1, 9, -]

For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:

1. Covariate = [1] if any of the following are true:
 - a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9].
2. Covariate = [0] if the following is true:
 - a. M0300B1 = [0, -, ^] and
 - b. M0300C1 = [0, -, ^] and
 - c. M0300D1 = [0, -, ^].

*All covariates are missing if no prior assessment is available.

The logistic regression model is of the form:

[Equation 1] QM triggered (yes=1, no=0) = $B_0 + B_1 \cdot COVA + B_2 \cdot COVB$

Where:

B0 is the logistic regression constant (B0 = -4.054929),

B1 is the logistic regression coefficient for the first covariate, bowel incontinence (B1 = 0.503225),

COVA is the resident-level score for the first covariate (0 or 1),

B2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV (B2 = 2.200337, and

COVB is the resident-level score for the second covariate (0 or 1)

Step 4b: Calculate the expected resident score for each resident with the following formula:

[Equation 2] Resident-level expected QM score = $1 / [1 + e^{-x}]$

Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.

Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.

Step 6. Calculate the facility-level adjusted score based on the:

- facility-level observed QM score (step 2b),
- facility-level expected QM score (step 5), and
- national average observed QM score (step 3).

The calculation of the adjusted score uses the following equation:

[Equation 3] Adj = $1 / [1 + e^{-y}]$

where

Adj is the facility-level adjusted QM score, and

$$y = (\ln(\text{Obs}/(1-\text{Obs}) - \ln(\text{Exp}/(1-\text{Exp}) + \ln(\text{Nat}/(1-\text{Nat})))$$

Obs is the facility-level observed QM rate,

Exp is the facility-level expected QM rate,

Nat is the national observed QM rate (Nat = 0.028926), and

Ln indicates a natural logarithm.

e is the base of natural logarithms

RTI International. (2019). Analysis of Q3, 2018 MDS 3.0 data (programming reference: rn27_47\LJC10_request_q2829_686.log)

Reference: The Centers for Medicare & Medicaid Services (CMS) (January 2019). MDS 3.0 Quality Measures User's Manual. RTI International, Waltham, MA. Accessed at:

<http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html>; please see "MDS 3.0 QM User's Manual" in the "User's Manuals" zipped folder in the Downloads section at the bottom of the page. 141592 | 150972 | 150970

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2456 Medication Reconciliation: Number of Unintentional Medication Discrepancies per Medication Per Patient

STEWARD

Brigham and Women's Hospital

DESCRIPTION

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

TYPE

Outcome

DATA SOURCE

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

LEVEL

Facility

NATIONAL QUALITY FORUM

SETTING

Inpatient/Hospital

NUMERATOR STATEMENT

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

NUMERATOR DETAILS

First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

DENOMINATOR STATEMENT

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random

sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

DENOMINATOR DETAILS

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

EXCLUSIONS

Patients that are discharged or expire before a gold standard medication list can be obtained.

EXCLUSION DETAILS

Please see exclusion listed above.

RISK ADJUSTMENT

No risk adjustment or risk stratification

STRATIFICATION

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

TYPE SCORE

Continuous variable, e.g. average better quality = lower score

ALGORITHM

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation) 135240

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3533e Hospital Harm – Severe Hyperglycemia

STEWARD

Centers for Medicare & Medicaid Services (CMS)

DESCRIPTION

This ratio electronic clinical quality measure (eCQM) assesses the number of hospital days with a severe hyperglycemic event (a blood glucose result >300 mg/dL, or a day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL) per the total qualifying hospital days among inpatient encounters for patients 18 years and older who have either:

1. A diagnosis of diabetes mellitus,
2. Received at least one administration of insulin or an anti-diabetic medication during the hospital admission, or

3. Had an elevated blood glucose level (>200 mg/dL) during their hospital admission.

TYPE

Outcome

DATA SOURCE

Electronic Health Records Hospitals collect EHR data using certified electronic health record technology (CEHRT). The measure authoring tool (MAT) output, which includes the human readable and XML artifacts of the clinical quality language (CQL) for the eQIM are contained in the specifications attached. No additional tools are used for data collection for eQIMs.

LEVEL

Facility

SETTING

Inpatient/Hospital

NUMERATOR STATEMENT

The total number of hyperglycemic days across all encounters divided by the total number of eligible days across all encounters. Hospital days are measured in 24-hour periods, starting from the time of arrival at the hospital (including Emergency Department). Days with a hyperglycemic event are defined as:

- A day with at least one blood glucose value >300 mg/dL; or
- A day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL.

We do not count >300 mg/DL events the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before discharge, if it was less than 24 hours.

NUMERATOR DETAILS

This is an eQIM, and therefore uses electronic health record (EHR) data to calculate the measure score. The 24-hour window for data collection is during an inpatient hospitalization, beginning at hospital arrival (whether through the Emergency Department, observation stay, or direct admission to inpatient).

All data elements necessary to calculate this eQIM are defined within value sets available in the Value Set Authority Center (VSAC) and listed below.

Glucose tests are represented by LOINC codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134). Codes include laboratory and point-of-care glucose tests, including glucose in blood, serum or plasma, venous blood, and arterial blood; and fasting glucose in venous blood and serum or plasma.

To access the value sets for the eQIM, please visit the Value Set Authority Center (VSAC), sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

DENOMINATOR STATEMENT

The initial population is all patients 18 years and older at the start of the measurement period with a discharged inpatient hospital admission during the measurement period, as well as either:

1. A diagnosis of diabetes that starts before or during the encounter; or

2. Administration of at least one dose of insulin or any anti-diabetic medication during the encounter; or
3. Presence of at least one blood glucose value >200 mg/dL at any time during the encounter.

The eQIM includes inpatient encounters which began in the Emergency Department or in observation status.

The denominator is the total number of eligible days across all encounters which match the initial population criteria. We do not count the the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before the discharge, if it was less than 24 hours. By excluding the first 24 hours of admission, we allow for correction of severe hyperglycemia that was present on admission. By excluding the last time period before discharge if it was less than 24 hours, we account for the fact that hospitals may not always be able to check glucose during the last time period, especially if it is only a few hours long. Eligible encounters that exceed 10 days are truncated to equal 10 days.

DENOMINATOR DETAILS

This eQIM includes all patients 18 years and older at the start of the measurement period, and all payers. The measurement period is 12 months.

- Glucose tests are represented by LOINC codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134).
- Inpatient Encounters are represented using the value set of SNOMEDCT codes (2.16.840.1.113883.3.666.5.307).
- Emergency Department Visits are represented using the value set of SNOMEDCT codes (2.16.840.1.113883.3.117.1.7.1.292).
- Observation Services are represented using the value set of SNOMEDCT codes (2.16.840.1.113762.1.4.1111.143).
- Patients who were given at least one administration of insulin or any anti-diabetic medication during the encounter are defined by the value set of RXNORM codes (2.16.840.1.113883.3.1260.1.1978). This value set includes medications and insulin capable of causing severe hyperglycemia (blood glucose value >300 mg/dL).
- Diabetes are represented using the value set of ICD10CM, ICD9CM, SNOMEDCT codes (2.16.840.1.113883.3.464.1003.103.12.1001). This value set includes patients diagnosed with diabetes before or during the encounter.

To access the value sets for the eQIM, please visit the Value Set Authority Center, sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

EXCLUSIONS

N/A; there are no denominator exclusions.

EXCLUSION DETAILS

N/A

RISK ADJUSTMENT

No risk adjustment or risk stratification

STRATIFICATION

N/A; this eQIM is not stratified.

TYPE SCORE

Ratio better quality = lower score

ALGORITHM

Target population: Inpatient encounters, all payers, where individuals are aged 18 years and older at the start of the measurement period and have:

1. A diagnosis of diabetes that starts before or during the encounter; or
2. Administration of at least one dose of insulin or any anti-diabetic medication during the encounter; or
3. Presence of at least one blood glucose value >200 mg/dL at any time during the encounter.

To create the denominator:

1. If the inpatient encounter occurred during the measurement period, go to Step 2. If not, do not include in the denominator.
2. Determine the patient's age in years. The patient's age is equal to the measurement period start date minus the birth date. If the patient is at least 18 years old, go to Step 3. If less than 18 years old, do not include in the denominator.
3. Determine if the patient had a diagnosis of diabetes mellitus before or during the hospital encounter, or if the patient was administered at least one dose of insulin or an anti-diabetic medication during the encounter, or if the patient had a glucose level of >200 mg/dL during the hospital encounter. If any of these three conditions exist, then include in the denominator. If not, do not include in the denominator.
4. (As the denominator is measured in days, which are defined as 24-hour periods starting at the time of arrival to the hospital (including the Emergency Department)): if the 24-hour period is not the first 24-hour period of the hospital admission, and is not the last period prior to hospital discharge if less than 24 hours, then include in the denominator. If it is the first 24-hour period or the last period prior to discharge that is less than 24 hours, do not include in the denominator.

a) By excluding for >300 mg/dL events the first 24 hours of admission, we allow for correction of severe hyperglycemia that was present on admission. By excluding the last time period before discharge if it was less than 24 hours, we account for the fact that hospitals may not always be able to check glucose during the last time period, especially if it is only a few hours long.

To create the numerator:

1. During any 24-hour period from arrival to the hospital (including the Emergency Department) except for the first 24-hour period and the last period prior to hospital discharge if less than 24 hours, any 24-hour period with a blood glucose level >300 mg/dL;
- Or
2. A 24-hour period in which a blood glucose value was not documented, and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL.

If either of these 2 events occur, then include in the numerator. If not, do not include in the numerator. 149896 | 146433 | 122107 | 141015

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Appendix E1: Related and Competing Measures (tabular format)

Comparison of NQF #0684 and NQF #0138

	0684: Percent of Residents with a Urinary Tract Infection (Long Stay)	0138: National Healthcare Safety Network (NHSN) Catheter associated Urinary Tract Infection (CAUTI) Outcome Measure
Steward	Centers for Medicare & Medicaid Services	Centers for Disease Control and Prevention
Description	This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.	Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) will be calculated among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals.
Type	Outcome	Outcome
Data Source	Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI). For MDS 3.0 item sets used to calculate the quality measure, refer to: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html . Available at measure-specific web page URL identified in S.1 No data dictionary	Electronic Health Data, Electronic Health Records, Other, Paper Medical Records NHSN Urinary Tract Infection form; NHSN Denominators for Intensive Care Unit (ICU)/Other Locations (not NICU or SCA) form; NHSN Denominators for Specialty Care Areas/Oncology form. Available at measure-specific web page URL identified in S.1 Attachment Copy_of_nhsn-data-dictionary.xlsx
Level	Facility	Facility, Other, Population : Regional and State
Setting	Post-Acute Care	Inpatient/Hospital, Other, Post-Acute Care Oncology hospital
Numerator Statement	The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.	Total number of observed healthcare-associated CAUTI among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs).
Numerator Details	The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay	1. Definition of Infection that is Present on Admission (POA): An infection where all of the elements of an infection definition are present during the two calendar days before the day of admission, the first day of admission (day 1) and/or the day after admission (day 2) and are documented in the medical chart. Infections that are POA

<p>residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident’s selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.</p> <p>Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.</p> <p>The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).</p> <p>An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.</p>	<p>should not be reported as healthcare-associated infections (HAI) and are not reported as CAUTI. Symptoms must be documented in the chart by a healthcare professional during the POA time frame (e.g., nursing home documents fever prior to arrival to the hospital, patient reports fever >38.0°C). Physician diagnosis alone cannot be accepted as evidence of a urinary tract infection that is POA.</p> <p>2. Definition of Healthcare-associated Infection (HAI): Any infection reported to NHSN must meet the definition of an NHSN HAI, that is, a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was not present on admission to the acute care facility. An infection is considered an HAI if the date of event of the NHSN site-specific infection criterion occurs on or after the 3rd calendar day of admission to an inpatient location where day of admission is calendar day 1. All elements of the site-specific infection criterion must occur during the infection window period.</p> <p>3. Definition of Infection Window Period: The NHSN Infection Window Period is defined as the 7-days during which all site-specific infection criteria must be met. It includes the day the first positive diagnostic test that is an element of the site-specific infection criterion, was obtained, the 3 calendar days before and the 3 calendar days after.</p> <p>4. Definition of CAUTI: A UTI (either a Symptomatic Urinary Tract Infection [SUTI], or an asymptomatic bacteremic urinary tract infection [ABUTI]) where an indwelling urinary catheter was in place for more than 2 consecutive days in an inpatient location 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 UTI date of event must be the day of discontinuation or the next calendar day to be catheter-associated.</p> <p>5. Definition of indwelling 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 or suprapubic catheters unless a indwelling urinary catheter is also present. Indwelling</p>
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		<p>urethral catheters that are used for intermittent or continuous irrigation are included in CAUTI surveillance.</p> <p>6. NHSN UTI criteria: Symptomatic Urinary Tract Infection criteria or Asymptomatic Bacteremic Urinary Tract Infection criteria. See below: A Symptomatic Urinary Tract Infection (SUTI) that is catheter associated must meet A) or B) below:</p> <p>A) Patient must meet 1, 2, and 3 below:</p> <ol style="list-style-type: none"> 1. Patient had an indwelling urinary catheter that had been in place for more than 2 consecutive days as an inpatient on the date of event (day of device placement = Day 1) AND was either: <ul style="list-style-type: none"> • Present for any portion of the calendar day on the date of event†, <p>OR</p> <ul style="list-style-type: none"> • Removed the day before the date of event‡ 2. Patient has at least one of the following signs or symptoms: <ul style="list-style-type: none"> • fever (>38.0°C) (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 =105 CFU/ml (See Comments). All elements of the UTI criterion must occur during the Infection Window Period (See Definition Chapter 2 Identifying HAIs in NHSN). <p>† When entering event into NHSN choose “INPLACE” for Risk Factor for Urinary Catheter</p> <p>‡ When entering event into NHSN choose “REMOVE” for Risk Factor for Urinary Catheter</p> <p>*With no other recognized cause (see Comments)</p>
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		<p>^ These symptoms cannot be used when catheter is in place. An indwelling urinary catheter in place could cause patient complaints of “frequency” “urgency” or “dysuria”.</p> <p>B) Patient must meet 1, 2, and 3 below:</p> <ol style="list-style-type: none"> 1. Patient is =1 year of age 2. Patient has at least one of the following signs or symptoms: <ul style="list-style-type: none"> • 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, at least one of which is a bacterium of =105 CFU/ml. All elements of the SUTI criterion must occur during the Infection Window Period <p>*With no other recognized cause</p> <p>‡ If patient had an indwelling urinary catheter in place for more than 2 consecutive days in an inpatient location, and catheter was in place on the date of event or the previous day the CAUTI criterion is met. If no such indwelling urinary catheter was in place, UTI (non-catheter associated) criterion is met.</p> <p>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.</p> <p>An Asymptomatic Bacteremic Urinary Tract Infection (ABUTI) that is catheter associated must meet the following:</p> <p>Patient must meet 1, 2, and 3 below:</p> <ol style="list-style-type: none"> 1. Patient has no signs or symptoms of SUTI 1 or 2 according to age 2. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of =105 CFU/ml 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
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		<p>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).</p> <p>** 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).</p> <p>7. Definition of Location of Attribution: The inpatient location where the patient was assigned on the date of the UTI event.</p> <p>8. Definition of Date of Event: The date when the first element used to meet the UTI criterion occurred during the infection window period.</p> <p>9. Definition of Repeat Infection Timeframe (RIT): The RIT is a 14-day timeframe during which no new infections of the same type are reported. The date of event is Day 1 of the 14-day RIT. Additional pathogens recovered during the RIT from the same type of infection are added to the event. The RIT will apply at the level of specific type of infection with the exception of BSI, UTI, and PNEU where the RIT will apply at the major type of infection.</p>
<p>Denominator or Statement</p>	<p>The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.</p>	<p>Total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline Data is calculated using the facility’s number of catheter days and the following significant risk factors:</p> <ul style="list-style-type: none"> • Acute Care Hospitals: CDC Location, Facility bed size, Medical school affiliation, and Facility type • Critical Access Hospitals: Medical school affiliation • Long-Term Acute Hospitals: Average length of stay, Setting type, and Location type • Inpatient Rehabilitation Facilities: Setting type, Proportion of admissions with traumatic and non-traumatic spinal cord dysfunction, Proportion of admissions with stroke
<p>Denominator or Details</p>	<p>Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment</p>	<p>Numbers of indwelling urinary catheter days attributed to each location are counted for each data period using the following definitions and guidelines. All indwelling urinary catheter days for each location and data period are summed.</p>

	<p>(assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).</p> <p>A description of the time period for the data included in this measure is provided in S.5 above.</p>	<ol style="list-style-type: none"> 1. Definition of indwelling catheter day: For each patient, a day that an indwelling urinary catheter was present at the time of the indwelling urinary catheter day count. 2. CDC Location (acute care hospitals, long term acute care hospitals): Each patient care area in a facility that is monitored in NHSN is “mapped” to one or more CDC Locations. The specific CDC Location code is determined by the type of patients cared for in that area according to the 80% Rule. That is, if 80% of patients are of a certain type (e.g., pediatric patients with orthopedic problems) then that area is designated as that type of location (in this case, an Inpatient Pediatric Orthopedic Ward). https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf 3. Medical school affiliation categories: <ol style="list-style-type: none"> a. Major – facility has a program for medical students and post-graduate medical training b. Graduate – facility has a program for post-graduate medical training (i.e., residency and/or fellowships) c. Undergraduate: facility has a program for medical students only 4. Facility bedsize: Number of beds set up and staffed in the healthcare facility 5. Setting (Freestanding or Within a Hospital): Describes physical placement of LTACH or IRF and does not define financial or administrative relationship with other healthcare facility types. 6. Definition for Facility Physician Education Status: Teaching statuses: major, graduate, undergraduate - Major: Facility has a program for medical students and post-graduate medical training; Graduate: Facility has a program for post-graduate medical training (i.e., residency and/or fellowships); Undergraduate: Facility has a program for medical students only. 7. Proportion of admissions within a diagnostic category: number of admissions during the calendar year where the primary diagnosis of that type (e.g. traumatic spinal cord dysfunction) divided by the total number of admissions during the calendar year
<p>Exclusions</p>	<p>If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure.</p>	<p>The following are not considered indwelling catheters by NHSN definitions:</p> <ol style="list-style-type: none"> 1. Suprapubic catheters

	A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.	<p>2. Condom catheters</p> <p>3. “In and out” catheterizations</p> <p>4. Nephrostomy tubes</p> <p>Note, that if a patient has either a nephrostomy tube or a suprapubic catheter and also has an indwelling urinary catheter, the indwelling urinary catheter will be included in the CAUTI surveillance.</p>
Exclusion Details	<p>A resident is excluded from the denominator if:</p> <ol style="list-style-type: none"> 1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]). 2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]). <p>If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.</p>	See S. 10
Risk Adjustment	No risk adjustment or risk stratification	Statistical risk model
Stratification	This is not applicable; this measure is not stratified.	CAUTI data is stratified by facility-specific and individual patient location data (i.e., bedsize of location, affiliation and level of affiliation with a medical school [Teaching statuses: major, graduate, undergraduate, not affiliated - See definitions S.7. above.
Type Score	Rate/proportion better quality = lower score	Ratio better quality = lower score
Algorithm	<p>Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).</p> <p>Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.</p> <p>Step 3: Divide the results of step 2 by the results of step 1.</p>	<p>The Standardized Infection Ratio (SIR) for annual and quarterly data aggregation and analysis of CAUTI events is calculated for each healthcare facility for a specified time period. The SIR is an indirect standardization method for summarizing healthcare associated infection (HAI) experience, including CAUTI events, in a single group of data or across any number of stratified groups of data. To produce the SIR:</p> <ol style="list-style-type: none"> 1. Identify number of observed healthcare-associated CAUTIs for a given time period by adding the total number of observed CAUTIs across the facility.

	<p>Step 4: Multiply the result of step 3 by 100 to obtain a percent value.</p> <p>A description of the time period for the data included in this measure is provided in S.5 above.</p>	<ol style="list-style-type: none"> 2. Calculate the number of predicted healthcare-associated CAUTIs for each CDC location using a negative binomial regression model and the risk factors described above. 3. Calculate the number of predicted healthcare-associated CAUTIs for the facility and time period by adding the predicted number of CAUTIs for each location across the facility. 4. Divide the number of observed healthcare-associated CAUTIs (1 above) by the number of predicted healthcare-associated CAUTIs (3 above) to obtain the SIR. 5. Perform a Poisson test to compare the SIR obtained in 4 above to the nominal value of 1. P-value and confidence interval will be calculated, which can be used to assess significance of SIR. (The NHSN analysis tool will perform the calculations once the patient infection data, denominator information, and related facility-level information are entered into the system.) <p>The Adjusted Ranking Metric (ARM) for annual data aggregation and analysis of HAI events, including CAUTI events, combines the method of indirect standardization used to calculate the unadjusted SIR described above with a Bayesian random effects hierarchical model to account for the potentially low precision and/or reliability inherent in the unadjusted SIR. A Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling is used to produce the adjusted numerator. The ARM enables more meaningful statistical differentiation between hospitals by accounting for differences in patient case-mix, exposure volume (e.g. patient days, indwelling urinary catheter days, central line-days, surgical procedure volume), and unmeasured factors that are not reflected in the unadjusted SIR and that cause variation between healthcare facilities. Accounting for these sources of variability enables better measure discrimination between facilities and leads to more reliable performance rankings. To produce the ARM:</p> <ol style="list-style-type: none"> 1. Identify the number of CAUTI in each location 2. Obtain the adjusted number of observed CAUTIs by using a Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling which results from a Bayesian random effects model. 3. Total these numbers for an observed number of CAUTIs
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		<p>4. Obtain the predicted number of CAUTIs in the same locations by multiplying the observed indwelling urinary catheter days according to the factors significantly associated with predicting CAUTI incidence as identified through a Log-linear Negative Binomial Regression Model.</p> <p>5. Divide the total number of adjusted CAUTI events (“3” above) by the predicted number of CAUTIs (“4” above).</p> <p>6. Result = ARM</p>
<p>Submission items</p>	<p>5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure 0281 : Urinary Tract Infection Admission Rate (PQI 12)</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers’ efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient’s leg to avoid bladder and urethral trauma, keeping</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized?</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact:</p> <p>5b.1 If competing, why superior or rationale for additive value:</p>

	<p>the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished.</p> <p>0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).</p> <p>5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.</p>	
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Comparison of NQF #0684 and NQF #0281

	0684: Percent of Residents with a Urinary Tract Infection (Long Stay)	0281: Urinary Tract Infection Admission Rate (PQI 12)
Steward	Centers for Medicare & Medicaid Services	Agency for Healthcare Research and Quality
Description	This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.	Admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Excludes kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions. [NOTE: The software provides the rate per population. However, common practice reports the measure as per 100,000 population. The user must multiply the rate obtained from the software by 100,000 to report admissions per 100,000 population.]
Type	Outcome	Outcome
Data Source	Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI). For MDS 3.0 item sets used to calculate the quality measure, refer to: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html . Available at measure-specific web page URL identified in S.1 No data dictionary	Claims All analyses were completed using data from the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID), 2007-2011. HCUP is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal government to create a national information resource of encounter-level health care data. The HCUP SID contain the universe of the inpatient discharge abstracts in participating States, translated into a uniform format to facilitate multi-State comparisons and analyses. Together, the SID encompass about 97 percent of all U.S. community hospital discharges (in 2011, 46 states participated for a total of more than 38.5 million hospital discharges). As defined by the American Hospital Association, community hospitals are all non-Federal, short-term, general or other specialty hospitals, excluding hospital units of institutions. Veterans hospitals and other Federal facilities are

		<p>excluded. Taken from the Uniform Bill-04 (UB-04), the SID data elements include ICD-9-CM coded principal and secondary diagnoses and procedures, additional detailed clinical and service information based on revenue codes, admission and discharge status, patient demographics, expected payment source (Medicare, Medicaid, private insurance as well as the uninsured), total charges and length of stay (www.hcup-us.ahrq.gov).</p> <p>HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2007-2011. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/sidoverview.jsp. (AHRQ QI Software Version 4.5)</p> <p>Available at measure-specific web page URL identified in S.1 Attachment PQI_12_Urinary_Tract_Infection_Admission_Rate.xlsx</p>										
Level	Facility	Population : Community, County or City, Population : Regional and State										
Setting	Post-Acute Care	Hospital										
Numerator Statement	The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.	<p>Discharges, for patients ages 18 years and older, with a principal ICD-10-CM diagnosis code for urinary tract infection.</p> <p>[NOTE: By definition, discharges with a principal diagnosis of urinary tract infection are precluded from an assignment of MDC 14 by grouper software. Thus, obstetric discharges should not be considered in the PQI rate, though the AHRQ QI™ software does not explicitly exclude obstetric cases.]</p>										
Numerator Details	The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the	<p>Urinary tract infection diagnosis codes: (ACSUTID)</p> <table border="1"> <thead> <tr> <th>ICD-10-CM</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>N10</td> <td>Acute tubulo-interstitial nephritis</td> </tr> <tr> <td>N119</td> <td>Chronic tubulo-interstitial nephritis, unspecified</td> </tr> <tr> <td>N12</td> <td>Tubulo-interstitial nephritis, not specified as acute or chronic</td> </tr> <tr> <td>N151</td> <td>Renal and perinephric abscess</td> </tr> </tbody> </table>	ICD-10-CM	Description	N10	Acute tubulo-interstitial nephritis	N119	Chronic tubulo-interstitial nephritis, unspecified	N12	Tubulo-interstitial nephritis, not specified as acute or chronic	N151	Renal and perinephric abscess
ICD-10-CM	Description											
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N151	Renal and perinephric abscess											

	<p>resident’s selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode. Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.</p> <p>The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).</p> <p>An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.</p>	<p>N159 Renal tubulo-interstitial disease, unspecified N16 Renal tubulo-interstitial disorders in diseases classified elsewhere N2884 Pyelitis cystica N2885 Pyeloureteritis cystica N2886 Ureteritis cystica N3000 Acute cystitis without hematuria N3001 Acute cystitis with hematuria N3090 Cystitis, unspecified without hematuria N3091 Cystitis, unspecified with hematuria</p> <p>NUMERATOR EXCLUSIONS Exclude cases: transfer from a hospital (different facility); transfer from a Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF); transfer from another health care facility; with any-listed ICD-10-CM diagnosis codes for kidney/urinary tract disorder; with any-listed ICD-10-CM diagnosis codes or any-listed ICD-10-PCS procedure codes for immunocompromised state; with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), principal diagnosis (DX1=missing), or county (PSTCO=missing) [For complete list of excluded codes, see attached technical specifications and Prevention Quality Indicators Appendix A – Admission Codes for Transfers and Appendix C – Immunocompromised State Diagnosis and Procedure Codes.]</p>
<p>Denominator Statement</p>	<p>The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.</p>	<p>Population ages 18 years and older in metropolitan area † or county. Discharges in the numerator are assigned to the denominator based on the metropolitan area or county of the patient residence, not the metropolitan area or county of the hospital where the discharge occurred.</p> <p>† The term “metropolitan area” (MA) was adopted by the U.S. Census in 1990 and referred collectively to metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs), and primary metropolitan statistical areas (PMSAs). In addition, “area”</p>

		could refer to either 1) FIPS county, 2) modified FIPS county, 3) 1999 OMB Metropolitan Statistical Area, or 4) 2003 OMB Metropolitan Statistical Area. Micropolitan Statistical Areas are not used in the QI software.
Denominator Details	Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9). A description of the time period for the data included in this measure is provided in S.5 above.	Not Applicable
Exclusions	If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.	Not applicable
Exclusion Details	A resident is excluded from the denominator if: 1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]). 2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]). If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.	Not applicable
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	This is not applicable; this measure is not stratified.	Not applicable
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score

<p>Algorithm</p>	<p>Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).</p> <p>Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.</p> <p>Step 3: Divide the results of step 2 by the results of step 1.</p> <p>Step 4: Multiply the result of step 3 by 100 to obtain a percent value.</p> <p>A description of the time period for the data included in this measure is provided in S.5 above.</p>	<p>The observed rate is the number of discharges flagged with the outcome of interest divided by the number of persons in the population at risk. The predicted rate is estimated for each person based on a logistic regression model. The expected rate is the average predicted rate for the unit of interest (i.e. the county of residence). The risk-adjusted rate is calculated using the indirect method as observed rate divided by expected rate multiplied by the reference population rate. The performance score is a weighted average of the risk adjusted rate and the reference population rate, where the weight is the signal-to-noise ratio.</p>
<p>Submission items</p>	<p>5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure 0281 : Urinary Tract Infection Admission Rate (PQI 12)</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers’ efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized?</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact:</p> <p>5b.1 If competing, why superior or rationale for additive value: Not applicable</p>

	<p>patient’s leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).</p> <p>5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.</p>	
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Comparison of NQF #0684 and NQF #0686

	0684: Percent of Residents with a Urinary Tract Infection (Long Stay)	0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.	This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.
Type	Outcome	Outcome
Data Source	Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI). For MDS 3.0 item sets used to calculate the quality measure, refer to: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html . Available at measure-specific web page URL identified in S.1 No data dictionary	Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15. For MDS 3.0 item sets used to calculate the quality measure, refer to: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html Available at measure-specific web page URL identified in S.1 No data dictionary
Level	Facility	Facility
Setting	Post-Acute Care	Post-Acute Care
Numerator Statement	The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.	The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.
Numerator Details	The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents	The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days (H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare &

	<p>during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident’s selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.</p> <p>Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.</p> <p>The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).</p> <p>An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.</p>	<p>Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident’s selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.</p> <p>Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.</p> <p>The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).</p> <p>An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.</p>
<p>Denominator or Statement</p>	<p>The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.</p>	<p>The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.</p>
<p>Denominator or Details</p>	<p>Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-</p>	<p>Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01,</p>

	, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9). A description of the time period for the data included in this measure is provided in S.5 above.	02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9). A description of the time period for the data included in this measure is provided in S.5 above.
Exclusions	If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.	The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.
Exclusion Details	A resident is excluded from the denominator if: 1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]). 2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]). If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.	If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS readmission/return anticipated assessment (A0310B = [06]), the resident is excluded. A resident is also excluded if any of the following conditions are true: 1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]). 2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]). 3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]). If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.
Risk Adjustment	No risk adjustment or risk stratification	Statistical risk model
Stratification	This is not applicable; this measure is not stratified.	This is not applicable; this measure is not stratified.
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score

<p>Algorithm</p>	<p>Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).</p> <p>Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.</p> <p>Step 3: Divide the results of step 2 by the results of step 1.</p> <p>Step 4: Multiply the result of step 3 by 100 to obtain a percent value.</p> <p>A description of the time period for the data included in this measure is provided in S.5 above.</p>	<p>This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows:</p> <p>Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.</p> <p>Step 2: Calculate the facility-level observed score (steps 2a through 2b below).</p> <p>Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).</p> <p>Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1</p> <p>Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.</p> <p>Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)</p> <p>Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model. Specifically, the covariates are calculated as follows:</p> <p>For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):</p> <ol style="list-style-type: none"> 1. Covariate = [1] if H0400 = [2, 3]; 2. Covariate = [0] if H0400 = [0, 1, 9, -] <p>For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:</p> <ol style="list-style-type: none"> 1. Covariate = [1] if any of the following are true: <ol style="list-style-type: none"> a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9]. 2. Covariate = [0] if the following is true: <ol style="list-style-type: none"> a. M0300B1 = [0, -, ^] and
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		<p>b. $M0300C1 = [0, -, ^]$ and</p> <p>c. $M0300D1 = [0, -, ^]$.</p> <p>*All covariates are missing if no prior assessment is available.</p> <p>The logistic regression model is of the form:</p> <p>[Equation 1] QM triggered (yes=1, no=0) = $B0 + B1*COVA + B2*COVB$</p> <p>Where:</p> <p>B0 is the logistic regression constant ($B0 = -4.054929$),</p> <p>B1 is the logistic regression coefficient for the first covariate, bowel incontinence ($B1 = 0.503225$),</p> <p>COVA is the resident-level score for the first covariate (0 or 1),</p> <p>B2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV ($B2 = 2.200337$, and</p> <p>COVB is the resident-level score for the second covariate (0 or 1)</p> <p>Step 4b: Calculate the expected resident score for each resident with the following formula:</p> <p>[Equation 2] Resident-level expected QM score = $1 / [1 + e^{-x}]$</p> <p>Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.</p> <p>Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.</p> <p>Step 6. Calculate the facility-level adjusted score based on the:</p> <ul style="list-style-type: none"> • facility-level observed QM score (step 2b), • facility-level expected QM score (step 5), and • national average observed QM score (step 3). <p>The calculation of the adjusted score uses the following equation:</p> <p>[Equation 3] Adj = $1 / [1 + e^{-y}]$</p> <p>where</p> <p>Adj is the facility-level adjusted QM score, and</p> <p>$y = (\ln(\text{Obs}/(1-\text{Obs})) - \ln(\text{Exp}/(1-\text{Exp})) + \ln(\text{Nat}/(1-\text{Nat})))$</p> <p>Obs is the facility-level observed QM rate,</p> <p>Exp is the facility-level expected QM rate,</p> <p>Nat is the national observed QM rate ($\text{Nat} = 0.028926$), and</p>
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<p>Submission items</p>	<p>5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure 0281 : Urinary Tract Infection Admission Rate (PQI 12)</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such,</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: N/A</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A – there are no competing measures for NQF #0686.</p>

	<p>providers’ efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient’s leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).</p> <p>5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.</p>	
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Comparison of NQF #0686 and NQF #0138

	0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)	0138: National Healthcare Safety Network (NHSN) Catheter associated Urinary Tract Infection (CAUTI) Outcome Measure
Steward	Centers for Medicare & Medicaid Services	Centers for Disease Control and Prevention
Description	This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.	Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) will be calculated among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals.
Type	Outcome	Outcome
Data Source	Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15. For MDS 3.0 item sets used to calculate the quality measure, refer to: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html Available at measure-specific web page URL identified in S.1 No data dictionary	Electronic Health Data, Electronic Health Records, Other, Paper Medical Records NHSN Urinary Tract Infection form; NHSN Denominators for Intensive Care Unit (ICU)/Other Locations (not NICU or SCA) form; NHSN Denominators for Specialty Care Areas/Oncology form. Available at measure-specific web page URL identified in S.1 Attachment Copy_of_nhsn-data-dictionary.xlsx
Level	Facility	Facility, Other, Population : Regional and State
Setting	Post-Acute Care	Inpatient/Hospital, Other, Post-Acute Care Oncology hospital
Numerator Statement	The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.	Total number of observed healthcare-associated CAUTI among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs).
Numerator Details	The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected	1. Definition of Infection that is Present on Admission (POA): An infection where all of the elements of an infection definition are

<p>quarter with a target assessment that indicates the use of indwelling catheters within the last seven days(H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident’s selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.</p> <p>Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.</p> <p>The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).</p> <p>An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.</p>	<p>present during the two calendar days before the day of admission, the first day of admission (day 1) and/or the day after admission (day 2) and are documented in the medical chart. Infections that are POA should not be reported as healthcare-associated infections (HAI) and are not reported as CAUTI. Symptoms must be documented in the chart by a healthcare professional during the POA time frame (e.g., nursing home documents fever prior to arrival to the hospital, patient reports fever >38.0°C). Physician diagnosis alone cannot be accepted as evidence of a urinary tract infection that is POA.</p> <p>2. Definition of Healthcare-associated Infection (HAI): Any infection reported to NHSN must meet the definition of an NHSN HAI, that is, a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was not present on admission to the acute care facility. An infection is considered an HAI if the date of event of the NHSN site-specific infection criterion occurs on or after the 3rd calendar day of admission to an inpatient location where day of admission is calendar day 1. All elements of the site-specific infection criterion must occur during the infection window period.</p> <p>3. Definition of Infection Window Period: The NHSN Infection Window Period is defined as the 7-days during which all site-specific infection criteria must be met. It includes the day the first positive diagnostic test that is an element of the site-specific infection criterion, was obtained, the 3 calendar days before and the 3 calendar days after.</p> <p>4. Definition of CAUTI: A UTI (either a Symptomatic Urinary Tract Infection [SUTI], or an asymptomatic bacteremic urinary tract infection [ABUTI]) where an indwelling urinary catheter was in place for more than 2 consecutive days in an inpatient location 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 UTI date of event must be the day of discontinuation or the next calendar day to be catheter-associated.</p> <p>5. Definition of indwelling 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</p>
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		<p>are not included nor are nephrostomy tubes or suprapubic catheters unless a indwelling urinary catheter is also present. Indwelling urethral catheters that are used for intermittent or continuous irrigation are included in CAUTI surveillance.</p> <p>6. NHSN UTI criteria: Symptomatic Urinary Tract Infection criteria or Asymptomatic Bacteremic Urinary Tract Infection criteria. See below: A Symptomatic Urinary Tract Infection (SUTI) that is catheter associated must meet A) or B) below:</p> <p>A) Patient must meet 1, 2, and 3 below:</p> <ol style="list-style-type: none"> 1. Patient had an indwelling urinary catheter that had been in place for more than 2 consecutive days as an inpatient on the date of event (day of device placement = Day 1) AND was either: <ul style="list-style-type: none"> • Present for any portion of the calendar day on the date of event†, <p>OR</p> <ul style="list-style-type: none"> • Removed the day before the date of event‡ <ol style="list-style-type: none"> 2. Patient has at least one of the following signs or symptoms: <ul style="list-style-type: none"> • fever (>38.0°C) (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 =105 CFU/ml (See Comments). All elements of the UTI criterion must occur during the Infection Window Period (See Definition Chapter 2 Identifying HAIs in NHSN). <p>† When entering event into NHSN choose “INPLACE” for Risk Factor for Urinary Catheter</p> <p>‡ When entering event into NHSN choose “REMOVE” for Risk Factor for Urinary Catheter</p> <p>*With no other recognized cause (see Comments)</p>
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		<p>^ These symptoms cannot be used when catheter is in place. An indwelling urinary catheter in place could cause patient complaints of “frequency” “urgency” or “dysuria”.</p> <p>B) Patient must meet 1, 2, and 3 below:</p> <ol style="list-style-type: none"> 1. Patient is =1 year of age 2. Patient has at least one of the following signs or symptoms: <ul style="list-style-type: none"> • 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, at least one of which is a bacterium of =10⁵ CFU/ml. All elements of the SUTI criterion must occur during the Infection Window Period <p>*With no other recognized cause</p> <p>‡ If patient had an indwelling urinary catheter in place for more than 2 consecutive days in an inpatient location, and catheter was in place on the date of event or the previous day the CAUTI criterion is met. If no such indwelling urinary catheter was in place, UTI (non-catheter associated) criterion is met.</p> <p>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.</p> <p>An Asymptomatic Bacteremic Urinary Tract Infection (ABUTI) that is catheter associated must meet the following:</p> <p>Patient must meet 1, 2, and 3 below:</p> <ol style="list-style-type: none"> 1. Patient has no signs or symptoms of SUTI 1 or 2 according to age 2. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of =10⁵ CFU/ml 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
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		<p>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).</p> <p>** 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)).</p> <p>7. Definition of Location of Attribution: The inpatient location where the patient was assigned on the date of the UTI event.</p> <p>8. Definition of Date of Event: The date when the first element used to meet the UTI criterion occurred during the infection window period.</p> <p>9. Definition of Repeat Infection Timeframe (RIT): The RIT is a 14-day timeframe during which no new infections of the same type are reported. The date of event is Day 1 of the 14-day RIT. Additional pathogens recovered during the RIT from the same type of infection are added to the event. The RIT will apply at the level of specific type of infection with the exception of BSI, UTI, and PNEU where the RIT will apply at the major type of infection.</p>
<p>Denominator or Statement</p>	<p>The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.</p>	<p>Total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline Data is calculated using the facility's number of catheter days and the following significant risk factors:</p> <ul style="list-style-type: none"> • Acute Care Hospitals: CDC Location, Facility bed size, Medical school affiliation, and Facility type • Critical Access Hospitals: Medical school affiliation • Long-Term Acute Hospitals: Average length of stay, Setting type, and Location type • Inpatient Rehabilitation Facilities: Setting type, Proportion of admissions with traumatic and non-traumatic spinal cord dysfunction, Proportion of admissions with stroke
<p>Denominator or Details</p>	<p>Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the</p>	<p>Numbers of indwelling urinary catheter days attributed to each location are counted for each data period using the following definitions and guidelines. All indwelling urinary catheter days for each location and data period are summed.</p>

	<p>selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01, 02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9). A description of the time period for the data included in this measure is provided in S.5 above.</p>	<ol style="list-style-type: none"> 1. Definition of indwelling catheter day: For each patient, a day that an indwelling urinary catheter was present at the time of the indwelling urinary catheter day count. 2. CDC Location (acute care hospitals, long term acute care hospitals): Each patient care area in a facility that is monitored in NHSN is “mapped” to one or more CDC Locations. The specific CDC Location code is determined by the type of patients cared for in that area according to the 80% Rule. That is, if 80% of patients are of a certain type (e.g., pediatric patients with orthopedic problems) then that area is designated as that type of location (in this case, an Inpatient Pediatric Orthopedic Ward). https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf 3. Medical school affiliation categories: <ol style="list-style-type: none"> a. Major – facility has a program for medical students and post-graduate medical training b. Graduate – facility has a program for post-graduate medical training (i.e., residency and/or fellowships) c. Undergraduate: facility has a program for medical students only 4. Facility bedsize: Number of beds set up and staffed in the healthcare facility 5. Setting (Freestanding or Within a Hospital): Describes physical placement of LTACH or IRF and does not define financial or administrative relationship with other healthcare facility types. 6. Definition for Facility Physician Education Status: Teaching statuses: major, graduate, undergraduate - Major: Facility has a program for medical students and post-graduate medical training; Graduate: Facility has a program for post-graduate medical training (i.e., residency and/or fellowships); Undergraduate: Facility has a program for medical students only. 7. Proportion of admissions within a diagnostic category: number of admissions during the calendar year where the primary diagnosis of that type (e.g. traumatic spinal cord dysfunction) divided by the total number of admissions during the calendar year
<p>Exclusions</p>	<p>The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The</p>	<p>The following are not considered indwelling catheters by NHSN definitions:</p> <ol style="list-style-type: none"> 1. Suprapubic catheters

	target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.	2. Condom catheters 3. "In and out" catheterizations 4. Nephrostomy tubes Note, that if a patient has either a nephrostomy tube or a suprapubic catheter and also has an indwelling urinary catheter, the indwelling urinary catheter will be included in the CAUTI surveillance.
Exclusion Details	If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS readmission/return anticipated assessment (A0310B = [06]), the resident is excluded. A resident is also excluded if any of the following conditions are true: 1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]). 2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]). 3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]). If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.	See S. 10
Risk Adjustment	Statistical risk model	Statistical risk model
Stratification	This is not applicable; this measure is not stratified.	CAUTI data is stratified by facility-specific and individual patient location data (i.e., bedsize of location, affiliation and level of affiliation with a medical school [Teaching statuses: major, graduate, undergraduate, not affiliated - See definitions S.7. above.
Type Score	Rate/proportion better quality = lower score	Ratio better quality = lower score
Algorithm	This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows: Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.	The Standardized Infection Ratio (SIR) for annual and quarterly data aggregation and analysis of CAUTI events is calculated for each healthcare facility for a specified time period. The SIR is an indirect standardization method for summarizing healthcare associated infection (HAI) experience, including CAUTI events, in a single group of

<p>Step 2: Calculate the facility-level observed score (steps 2a through 2b below).</p> <p>Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).</p> <p>Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1</p> <p>Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.</p> <p>Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)</p> <p>Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model. Specifically, the covariates are calculated as follows: For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):</p> <ol style="list-style-type: none"> 1. Covariate = [1] if H0400 = [2, 3]; 2. Covariate = [0] if H0400 = [0, 1, 9, -] <p>For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:</p> <ol style="list-style-type: none"> 1. Covariate = [1] if any of the following are true: <ol style="list-style-type: none"> a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9]. 2. Covariate = [0] if the following is true: <ol style="list-style-type: none"> a. M0300B1 = [0, -, ^] and b. M0300C1 = [0, -, ^] and c. M0300D1 = [0, -, ^]. <p>*All covariates are missing if no prior assessment is available. The logistic regression model is of the form:</p>	<p>data or across any number of stratified groups of data. To produce the SIR:</p> <ol style="list-style-type: none"> 1. Identify number of observed healthcare-associated CAUTIs for a given time period by adding the total number of observed CAUTIs across the facility. 2. Calculate the number of predicted healthcare-associated CAUTIs for each CDC location using a negative binomial regression model and the risk factors described above. 3. Calculate the number of predicted healthcare-associated CAUTIs for the facility and time period by adding the predicted number of CAUTIs for each location across the facility. 4. Divide the number of observed healthcare-associated CAUTIs (1 above) by the number of predicted healthcare-associated CAUTIs (3 above) to obtain the SIR. 5. Perform a Poisson test to compare the SIR obtained in 4 above to the nominal value of 1. P-value and confidence interval will be calculated, which can be used to assess significance of SIR. <p>(The NHSN analysis tool will perform the calculations once the patient infection data, denominator information, and related facility-level information are entered into the system.)</p> <p>The Adjusted Ranking Metric (ARM) for annual data aggregation and analysis of HAI events, including CAUTI events, combines the method of indirect standardization used to calculate the unadjusted SIR described above with a Bayesian random effects hierarchical model to account for the potentially low precision and/or reliability inherent in the unadjusted SIR. A Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling is used to produce the adjusted numerator. The ARM enables more meaningful statistical differentiation between hospitals by accounting for differences in patient case-mix, exposure volume (e.g. patient days, indwelling urinary catheter days, central line-days, surgical procedure volume), and unmeasured factors that are not reflected in the unadjusted SIR and that cause variation between healthcare facilities. Accounting for these sources of variability enables better measure discrimination between facilities and leads to more reliable performance rankings. To produce the ARM:</p> <ol style="list-style-type: none"> 1. Identify the number of CAUTI in each location
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<p>[Equation 1] QM triggered (yes=1, no=0) = $B0 + B1*COVA + B2*COVB$</p> <p>Where:</p> <p>B0 is the logistic regression constant (B0 = -4.054929),</p> <p>B1 is the logistic regression coefficient for the first covariate, bowel incontinence (B1 = 0.503225),</p> <p>COVA is the resident-level score for the first covariate (0 or 1),</p> <p>B2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV (B2 = 2.200337, and</p> <p>COVB is the resident-level score for the second covariate (0 or 1)</p> <p>Step 4b: Calculate the expected resident score for each resident with the following formula:</p> <p>[Equation 2] Resident-level expected QM score = $1 / [1 + e^{-x}]$</p> <p>Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.</p> <p>Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.</p> <p>Step 6. Calculate the facility-level adjusted score based on the:</p> <ul style="list-style-type: none"> • facility-level observed QM score (step 2b), • facility-level expected QM score (step 5), and • national average observed QM score (step 3). <p>The calculation of the adjusted score uses the following equation:</p> <p>[Equation 3] Adj = $1 / [1 + e^{-y}]$</p> <p>where</p> <p>Adj is the facility-level adjusted QM score, and</p> <p>$y = (\ln(\text{Obs}/(1-\text{Obs})) - \ln(\text{Exp}/(1-\text{Exp})) + \ln(\text{Nat}/(1-\text{Nat})))$</p> <p>Obs is the facility-level observed QM rate,</p> <p>Exp is the facility-level expected QM rate,</p> <p>Nat is the national observed QM rate (Nat = 0.028926), and</p> <p>Ln indicates a natural logarithm.</p> <p>e is the base of natural logarithms</p>	<ol style="list-style-type: none"> 2. Obtain the adjusted number of observed CAUTIs by using a Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling which results from a Bayesian random effects model. 3. Total these numbers for an observed number of CAUTIs 4. Obtain the predicted number of CAUTIs in the same locations by multiplying the observed indwelling urinary catheter days according to the factors significantly associated with predicting CAUTI incidence as identified through a Log-linear Negative Binomial Regression Model. 5. Divide the total number of adjusted CAUTI events (“3” above) by the predicted number of CAUTIs (“4” above). 6. Result = ARM
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	<p>RTI International. (2019). Analysis of Q3, 2018 MDS 3.0 data (programming reference: rn27_47\LJC10_request_q2829_686.log) Reference: The Centers for Medicare & Medicaid Services (CMS) (January 2019). MDS 3.0 Quality Measures User’s Manual. RTI International, Waltham, MA. Accessed at: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQQualityMeasures.html; please see “MDS 3.0 QM User’s Manual” in the “User’s Manuals” zipped folder in the Downloads section at the bottom of the page.</p>	
Submission items	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: N/A</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A – there are no competing measures for NQF #0686.</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized?</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact:</p> <p>5b.1 If competing, why superior or rationale for additive value:</p>

Comparison of NQF #0686 and NQF #0684

	0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)	0684: Percent of Residents with a Urinary Tract Infection (Long Stay)
Steward	Centers for Medicare & Medicaid Services	Centers for Medicare & Medicaid Services
Description	<p>This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home</p>	<p>This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.</p>

	residents are identified as those who have had 101 or more cumulative days of nursing home care.	
Type	Outcome	Outcome
Data Source	<p>Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15.</p> <p>For MDS 3.0 item sets used to calculate the quality measure, refer to: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html</p> <p>Available at measure-specific web page URL identified in S.1 No data dictionary</p>	<p>Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).</p> <p>For MDS 3.0 item sets used to calculate the quality measure, refer to: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html.</p> <p>Available at measure-specific web page URL identified in S.1 No data dictionary</p>
Level	Facility	Facility
Setting	Post-Acute Care	Post-Acute Care
Numerator Statement	The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.	The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.
Numerator Details	<p>The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days(H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident’s selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.</p> <p>Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the</p>	<p>The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident’s selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.</p> <p>Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.</p>

	<p>nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.</p> <p>The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).</p> <p>An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.</p>	<p>The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).</p> <p>An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.</p>
Denominator or Statement	<p>The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.</p>	<p>The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.</p>
Denominator or Details	<p>Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01, 02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9).</p> <p>A description of the time period for the data included in this measure is provided in S.5 above.</p>	<p>Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).</p> <p>A description of the time period for the data included in this measure is provided in S.5 above.</p>
Exclusions	<p>The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment</p>	<p>If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.</p>

	indicates obstructive uropathy or obstructive uropathy status is missing.	
Exclusion Details	<p>If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS readmission/return anticipated assessment (A0310B = [06]), the resident is excluded.</p> <p>A resident is also excluded if any of the following conditions are true:</p> <ol style="list-style-type: none"> 1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]). 2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]). 3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]). <p>If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.</p>	<p>A resident is excluded from the denominator if:</p> <ol style="list-style-type: none"> 1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]). 2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]). <p>If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.</p>
Risk Adjustment	Statistical risk model	No risk adjustment or risk stratification
Stratification	This is not applicable; this measure is not stratified.	This is not applicable; this measure is not stratified.
Type Score	Rate/proportion better quality = lower score	Rate/proportion better quality = lower score
Algorithm	<p>This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows:</p> <p>Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.</p> <p>Step 2: Calculate the facility-level observed score (steps 2a through 2b below).</p> <p>Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).</p>	<p>Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).</p> <p>Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.</p> <p>Step 3: Divide the results of step 2 by the results of step 1.</p> <p>Step 4: Multiply the result of step 3 by 100 to obtain a percent value.</p>

<p>Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1</p> <p>Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.</p> <p>Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)</p> <p>Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model. Specifically, the covariates are calculated as follows:</p> <p>For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):</p> <ol style="list-style-type: none"> 1. Covariate = [1] if H0400 = [2, 3]; 2. Covariate = [0] if H0400 = [0, 1, 9, -] <p>For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:</p> <ol style="list-style-type: none"> 1. Covariate = [1] if any of the following are true: <ol style="list-style-type: none"> a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9]. 2. Covariate = [0] if the following is true: <ol style="list-style-type: none"> a. M0300B1 = [0, -, ^] and b. M0300C1 = [0, -, ^] and c. M0300D1 = [0, -, ^]. <p>*All covariates are missing if no prior assessment is available.</p> <p>The logistic regression model is of the form: [Equation 1] QM triggered (yes=1, no=0) = B0 + B1*COVA + B2*COVB</p> <p>Where:</p> <p>B0 is the logistic regression constant (B0 = -4.054929), B1 is the logistic regression coefficient for the first covariate, bowel incontinence (B1 = 0.503225), COVA is the resident-level score for the first covariate (0 or 1),</p>	<p>A description of the time period for the data included in this measure is provided in S.5 above.</p>
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<p>B2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV ($B2 = 2.200337$, and COVB is the resident-level score for the second covariate (0 or 1)</p> <p>Step 4b: Calculate the expected resident score for each resident with the following formula:</p> <p>[Equation 2] Resident-level expected QM score = $1 / [1 + e^{-x}]$</p> <p>Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.</p> <p>Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.</p> <p>Step 6. Calculate the facility-level adjusted score based on the:</p> <ul style="list-style-type: none"> • facility-level observed QM score (step 2b), • facility-level expected QM score (step 5), and • national average observed QM score (step 3). <p>The calculation of the adjusted score uses the following equation:</p> <p>[Equation 3] $Adj = 1 / [1 + e^{-y}]$</p> <p>where</p> <p>Adj is the facility-level adjusted QM score, and</p> <p>$y = (\ln(Obs/(1-Obs)) - \ln(Exp/(1-Exp)) + \ln(Nat/(1-Nat)))$</p> <p>Obs is the facility-level observed QM rate,</p> <p>Exp is the facility-level expected QM rate,</p> <p>Nat is the national observed QM rate ($Nat = 0.028926$), and</p> <p>Ln indicates a natural logarithm.</p> <p>e is the base of natural logarithms</p> <p>RTI International. (2019). Analysis of Q3, 2018 MDS 3.0 data (programming reference: rn27_47\LJC10_request_q2829_686.log)</p> <p>Reference: The Centers for Medicare & Medicaid Services (CMS) (January 2019). MDS 3.0 Quality Measures User's Manual. RTI International, Waltham, MA. Accessed at: http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html;</p>	
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	<p>please see “MDS 3.0 QM User’s Manual” in the “User’s Manuals” zipped folder in the Downloads section at the bottom of the page.</p>	
<p>Submission items</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: N/A</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A – there are no competing measures for NQF #0686.</p>	<p>5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure 0281 : Urinary Tract Infection Admission Rate (PQI 12)</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers’ efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient’s leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be</p>

		<p>substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).</p> <p>5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.</p>
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Comparison of NQF #2456 and NQF #0097

	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient	0097: Medication Reconciliation Post Discharge
Steward	Brigham and Women's Hospital	National Committee for Quality Assurance
Description	<p>This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.</p> <p>At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.</p>	<p>The percentage of discharges for patients 18 years of age and older for whom the discharge medication list was reconciled with the current medication list in the outpatient medical record by a prescribing practitioner, clinical pharmacist or registered nurse.</p>
Type	Outcome	Process
Data Source	<p>Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.</p> <p>Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx</p>	<p>Claims, Electronic Health Records, Paper Medical Records Health Plan Level:</p> <ul style="list-style-type: none"> - This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations via NCQA's online data submission system. <p>Physician Level:</p> <ul style="list-style-type: none"> - This measure is based on administrative claims to identify the eligible population and medical record documentation collected in the course of providing care to health plan patients to identify the numerator. In the PQRS program, this measure is coded using CPT and CPT Category II codes specific to quality measurement. <p>No data collection instrument provided Attachment Hospice_Value_Set.xlsx</p>
Level	Facility	Clinician : Group/Practice, Health Plan, Clinician : Individual, Integrated Delivery System

Setting	Inpatient/Hospital	Clinician Office/Clinic
Numerator Statement	For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.	Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse on or within 30 days of discharge. Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.
Numerator Details	<p>First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.</p> <p>The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not</p>	<p>This measure is specified for medical record or administrative data collection.</p> <p>Medical Record Numerator Details:</p> <ul style="list-style-type: none"> - Documentation in the outpatient medical record must include evidence of medication reconciliation between the inpatient medication list and the medication list in the outpatient medical record, and the date on which it was performed. Any of the following evidence meets criteria: (1) Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in meds since discharge, same meds at discharge, discontinue all discharge meds), (2) Documentation of the patient’s current medications with a notation that the discharge medications were reviewed, (3) Documentation that the provider “reconciled the current and discharge meds,” (4) Documentation of a current medication list, a discharge medication list and notation that the appropriate practitioner type reviewed both lists on the same date of service, (5) Notation that no medications were prescribed or ordered upon discharge, (6) Evidence that the patient was seen for post-discharge follow-up with evidence of medication reconciliation or review, (7) Documentation in the discharge summary that the discharge medications were reconciled with the current medications. 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). <p>Administrative:</p> <p>Medication Reconciliation CPT Codes:</p> <ul style="list-style-type: none"> - 99495: Transitional care management services with the following required elements: (1) communication (direct contact, telephone, electronic) with the patient and/or caregiver within 2 business days of discharge, (2) medical decision making of at least moderate complexity during the service period and (3) face-to-face visit, within 14 calendar days of discharge. - 99496: Transitional care management services with the following required elements: (1) communication (direct contact, telephone, electronic) with the patient and/or caregiver within 2 business days of discharge, (2) medical decision making of high complexity during the service period and (3) face-to-face visit, within 7 calendar days of discharge.

	<p>clearly intentional are then recorded, along with the reason for the discrepancy:</p> <ol style="list-style-type: none"> 1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission) 2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error. <p>The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.</p> <p>See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.</p>	<p>- 1111F: Discharge med/current med merge</p>
<p>Denominator Statement</p>	<p>The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled</p>	<p>All discharges from an in-patient setting for patients who are 18 years and older.</p>

	<p>per month, or approximately 1 patient per weekday.</p> <p>So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.</p>	
<p>Denominator Details</p>	<p>Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.</p>	<p>The denominator for this measure is identified by administrative codes, which are specific to the level of reporting. The denominator for both levels of reporting is based on episodes, not patients. If patients have more than one discharge, include all discharges between January 1 and December 1 of the measurement year. This measure is stratified by age group so three denominator groups are identified for each level of reporting: Patients age 18-64, Patients age 65+ and all patients.</p> <p>Health Plan Level:</p> <p>Administrative:</p> <ul style="list-style-type: none"> - An acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year. - Stratify the denominator by age group based on age as of December 31 of the measurement year: Patients 18-64 years of age; Patients 65 years of age and older; All Patients 18 years of age and older. <p>Physician Level:</p> <ul style="list-style-type: none"> - Patients who were discharged from an acute or nonacute inpatient facility on or between January 1 and December 1 of the measurement year and seen within 30 days following discharge in the office by the physician, prescribing practitioner, registered nurse, or clinical pharmacist providing on-going care. Codes to identify visit with on-going care provider are below. - Stratify the denominator by age group based on age on the date of encounter: Patients 18-64 years of age; Patients 65 years of age and older; All Patients 18 years of age and older. <p>CPT encounter codes for visit with Ongoing Care Provider:</p> <p>90791, 90792, 90832, 90834, 90837, 90839, 90845, 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, G0402, G0438, G0439</p>

Exclusions	Patients that are discharged or expire before a gold standard medication list can be obtained.	<p>The following exclusions are applicable to the Health Plan Level measure.</p> <ul style="list-style-type: none"> - Exclude both the initial discharge and the readmission/direct transfer discharge if the readmission/direct transfer discharge occurs after December 1 of the measurement year. - If the discharge is followed by a readmission or direct transfer to an acute or non-acute facility within the 30-day follow-up period, count only the readmission discharge or the discharge from the facility to which the patient was transferred. - Exclude patients using hospice services anytime during the measurement year. <p>The following exclusions are applicable to the Physician Level measure.</p> <ul style="list-style-type: none"> - Exclude patients who use hospice services during the measurement period
Exclusion Details	Please see exclusion listed above.	<p>For the Health Plan Level, exclude patients using hospice services anytime during the measurement year.</p> <p>For the Physician Level, exclude patients who had a claim for hospice services (Hospice Value Set or G9691) during the measurement period. In the Quality Payment Program (QPP) this exclusion can be collected using G-codes specific to quality measurement: G9690.</p>
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.	N/A
Type Score	Continuous variable, e.g. average better quality = lower score	Rate/proportion better quality = higher score
Algorithm	See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))	<p>Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older.</p> <p>Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year. Stratify the patients by age groups. Exclude patients who received hospice services during the measurement year.</p> <p>Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a</p>

		<p>reconciliation of the discharge medications with the current medication list in the outpatient medical record documented.</p> <p>Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2 for each age strata.</p>
<p>Submission items</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A</p>	<p>5.1 Identified measures: 0553 : Care for Older Adults (COA) – Medication Review 0646 : Reconciled Medication List Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care) 2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient 0419 : Documentation of Current Medications in the Medical Record</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details.</p> <p>5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and an outpatient medication list conducted post hospital discharge by an ongoing care provider and documented in the outpatient record. The denominator for this measure is all patients 18+ discharged from an inpatient facility to the community.</p> <p>Related Measures: Measure 0553 is conducted at health plan level. This measure assesses annual outpatient medication review by a prescribing practitioner or clinical pharmacist among all patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure. Measure 0646 is conducted at the facility level. This measure assesses whether the patient received a reconciled medication list at the time of discharge. The denominator for this measure is all patients, regardless of age, discharged from the hospital. This measure is only focused on the reconciliation of medications that were prescribed during the inpatient stay and looks to see if the patient themselves receive this reconciled list at discharge. This measure does not address whether a reconciled medication list is documented in the outpatient medical record. Therefore the measure focus is different from measure 0097, which focuses on whether or not a patients’ discharge medications were reconciled with their current medications in the outpatient setting.</p>

		<p>Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097.</p> <p>Measure 0419 is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing.</p>
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Comparison of NQF #2456 and NQF #0419e

	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient	0419e: Documentation of Current Medications in the Medical Record
Steward	Brigham and Women's Hospital	Centers for Medicare & Medicaid Services
Description	<p>This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.</p> <p>At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.</p>	<p>For both the 2018 claims and registry specifications AND the 2019 performance period eMeasure (v8) the measure description is as follows:</p> <p>Percentage of visits for patients aged 18 years and older for which the eligible professional or eligible clinician attests to documenting a list of current medications using all immediate resources available on the date of the encounter. This list must include ALL known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosage, frequency and route of administration.</p>
Type	Outcome	Process
Data Source	<p>Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.</p> <p>Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx</p>	<p>Claims, Electronic Health Records, Registry Data The data source is the medical record, which provides patient information for the encounter; Medicare Part B Claims and Registry data, and EHR reports.</p> <p>No data collection instrument provided Attachment CMS68_Q1130_NQF0419_NQF_AU_2018_S_2b_Code_Table_121218.xlsx</p>
Level	Facility	Clinician : Group/Practice, Clinician : Individual
Setting	Inpatient/Hospital	Outpatient Services
Numerator Statement	<p>For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.</p>	<p>Numerator statements for both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8) is as follows:</p> <p>Eligible professional or eligible clinician attests to documenting, updating, or reviewing the patient's current medications using all immediate resources available on the date of the encounter. This list must include ALL prescriptions, over-the counters, herbals, vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosages, frequency, and route of administration.</p>

<p>Numerator Details</p>	<p>First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.</p> <p>The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:</p> <ol style="list-style-type: none"> 1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission 	<p>2018 claims and registry specifications: The numerator Quality-Data Coding Options for Reporting Satisfactorily:</p> <p>Current Medications Documented</p> <p>Performance Met: G8427: Eligible clinician attests to documenting in the medical record they obtained, updated, or reviewed the patient’s current medications.</p> <p>OR</p> <p>Current Medications not Documented, Patient not Eligible</p> <p>Denominator Exception: G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician</p> <p>OR</p> <p>Current Medications with Name, Dosage, Frequency, or Route not Documented, Reason not Given.</p> <p>Performance Not Met: G8428: Current list of medications not documented as obtained, updated, or reviewed by the eligible professional, reason not given.</p> <p>Definitions include:</p> <p>Current Medications – Medications the patient is presently taking including all prescriptions, over-the-counters, herbals and vitamin/mineral/dietary (nutritional) supplements with each medication’s name, dosage, frequency and administered route.</p> <p>Route – Documentation of the way the medication enters the body (some examples include but are not limited to: oral, sublingual, subcutaneous injections, and/or topical).</p> <p>Within the 2019 performance period eMeasure (v8), the numerator is defined as:</p> <p>"Medications Documented During Qualifying Encounter":</p> <p>"Qualifying Encounters During Measurement Period"</p> <p>QualifyingEncounterDuringMeasurementPeriod</p> <p>with ["Procedure, Performed": "Documentation of current medications (procedure)"]</p> <p>MedicationsDocumented such that MedicationsDocumented.relevantPeriod during QualifyingEncounterDuringMeasurementPeriod.relevantPeriod</p> <p>SNOMED-CT code (428191000124101) is used to capture the numerator.</p>
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	<p>medication list, and therefore does not order it at admission)</p> <p>2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.</p> <p>The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.</p> <p>See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.</p>	
<p>Denominator Statement</p>	<p>The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.</p> <p>So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$</p>	<p>Denominator statement for the 2018 claims and registry specifications is as follows: “All visits for patients aged 18 years and older.”</p> <p>Denominator statement for the 2019 performance period eMeasure (v8) is “Equals Initial Population”. Initial Population is defined as: “All visits occurring during the 12 month measurement period for patients aged 18 years and older.”</p>

	discrepancies per medication per patient for that hospital for that month.	
Denominator Details	<p>Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.</p>	<p>For the purposes of defining the denominator in both the claims and registry and eMeasure versions, the denominator is defined by the patient’s age (based on patient’s date of birth), encounter date, denominator CPT or HCPCS codes.</p> <p>2018 claims and registry specifications: Denominator Criteria (Eligible Cases): Patients aged >= 18 years on date of encounter AND Patient encounter during the reporting period (CPT or HCPCS): 59400, 59510, 59610, 59618, 90791, 90792, 90832, 90834, 90837, 90839, 92002, 92004, 92012, 92014, 92507, 92508, 92526, 92537, 92538, 92540, 92541, 92542, 92544, 92545, 92547, 92548, 92550, 92557, 92567, 92568, 92570, 92585, 92588, 92626, 96116, 96150, 96151, 96152, 97127*, 97161, 97162, 97163, 97164, 97165, 97166, 97167, 97168, 97802, 97803, 97804, 98960, 98961, 98962, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99221, 99222, 99223, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, 99281, 99282, 99283, 99284, 99285, 99385*, 99386*, 99387*, 99395*, 99396*, 99397*, G0101, G0108, G0270, G0402, G0438, G0439 [*Signifies that this CPT Category I code is a non-covered service under the PFS (Physician Fee Schedule). These non-covered services will not be counted in the denominator population for claims-based measures.]</p> <p>Within the 2019 performance period eMeasure (v8), the denominator is defined as the initial population where: "Qualifying Encounters During Measurement Period" QualifyingEncounter where "Patient Age 18 or Older at Start of Measurement Period"</p> <p>The eMeasure denominator includes the above CPT and HCPCS codes as well as SNOMED-CT codes in the Medications Encounter Code Set Grouping Value set OID: 2.16.840.1.113883.3.600.1.1834.</p>
Exclusions	<p>Patients that are discharged or expire before a gold standard medication list can be obtained.</p>	<p>Denominator exception for the 2018 claims and registry specifications is as follows: A patient is not eligible if the following reason is documented: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient’s health status on the date of the encounter</p> <p>Denominator exception for the 2019 performance period eMeasure (v8) is as follows: Medical Reason: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient’s health status</p>

<p>Exclusion Details</p>	<p>Please see exclusion listed above.</p>	<p>2018 claims and registry specifications: Current Medications not Documented, Patient not Eligible Denominator Exception G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician. Within the 2019 performance period eMeasure (v8), the denominator exception is defined as: "Qualifying Encounters During Measurement Period" EncounterDuringMeasurementPeriod with "Medications Not Documented for Medical Reason" MedicationsNotDocumented such that MedicationsNotDocumented.authorDatetime during EncounterDuringMeasurementPeriod.relevantPeriod The eMeasure denominator exception includes codes in the value set Medical or Other reason not done SNOMED-CT Value Set OID 2.16.840.1.113883.3.600.1.1502 to capture the denominator exception.</p>
<p>Risk Adjustment</p>	<p>No risk adjustment or risk stratification</p>	<p>No risk adjustment or risk stratification</p>
<p>Stratification</p>	<p>Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.</p>	<p>This measure is not stratified.</p>
<p>Type Score</p>	<p>Continuous variable, e.g. average better quality = lower score</p>	<p>Rate/proportion better quality = higher score</p>
<p>Algorithm</p>	<p>See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation)</p>	<p>For both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8), the performance calculation is as follows: PERFORMANCE CALCULATION To calculate provider performance, complete a fraction with the following measure components: Numerator (A), Denominator (D), and Denominator Exceptions (C) Numerator (A): Number of visits meeting numerator criteria Denominator (D): Number of visits meeting criteria for denominator inclusion Denominator Exceptions (C): Number of visits not meeting numerator criteria with valid exceptions The method of performance calculation is determined by the following:</p>

		<p>1) identify the visits that meet the eligibility criteria for the denominator (D) which includes patients who are 18 years and older with appropriate encounters as defined by encounter codes or encounter value set during the reporting period.</p> <p>2) identify which visits meet the numerator criteria (A)</p> <p>3) for those visits who do not meet the numerator criteria, determine whether an appropriate exception applies (C) and subtract those visits from the denominator with the following calculation: Numerator (A)/[Denominator (D)– Denominator Exceptions (C)]</p>
<p>Submission items</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation.</p>	<p>5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge 0553 : Care for Older Adults (COA) – Medication Review 0554 : Medication Reconciliation Post-Discharge (MRP)</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: NQF 0553 is the most similar conceptually to NQF 0419. NQF 0553 is a process measure that focuses solely on the elderly population (namely, those 66 years and older) and requires evidence of at least one medication review during the entire measurement year. Our measure (NQF 0419) encompasses a larger population (all adults 18 years of age and older) and requires a medication review at every encounter. Unlike NQF 0419, there is no e Measure available for NQF 0553. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events. NQF 0554 is a process measure focused on the elderly population (namely, those 66 years and older) that requires medication reconciliation within 30 days for patients discharged from the hospital. NQF 0419 is different from this measure in the following ways: (1) the population focus for NQF 0419 is inclusive of all patients 18 years and older, not just those 66 years and older discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient’s discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0554 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more</p>

	<p>Dr. Schnipper would be happy to be involved in these efforts.</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A</p>	<p>rapid identification of medication discrepancies and is more likely to prevent adverse drug events. NQF 0097 is a process measure that reflects follow-up care following discharge from an inpatient setting for patients aged 18 years and older (performance is stratified into two age groups: patients 18-65 and patients 65 and older) who are discharged from any inpatient facility. This measure requires that medication reconciliation be conducted if the patient is seen within 30 days of discharge following an inpatient hospitalization. NQF 0097 is only reported if a patient receives follow-up care within 30 days following discharge from any inpatient setting. NQF 0419 is different from this measure in the following ways: (1) the population of focus for NQF 0419 is inclusive of all patients 18 years and older, not just those discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient’s discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0419 is appropriate for reporting by any EP and must be reported for every eligible encounter. Lastly, NQF 0097 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events.</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A</p>
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Comparison of NQF #2456 and NQF #0553

	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient	0553: Care for Older Adults (COA) Medication Review
Steward	Brigham and Women's Hospital	National Committee for Quality Assurance
Description	<p>This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.</p> <p>At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.</p>	<p>Percentage of adults 65 years and older who had a medication review during the measurement year. A medication review is a review of all a patient's medications, including prescription medications, over-the-counter (OTC) medications and herbal or supplemental therapies by a prescribing practitioner or clinical pharmacist.</p>
Type	Outcome	Process
Data Source	<p>Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.</p> <p>Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx</p>	<p>Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from health plans via NCQA's online data submission system.</p> <p>No data collection instrument provided Attachment 0553_COA_Med_Review_Value_Sets.xlsx</p>
Level	Facility	Health Plan
Setting	Inpatient/Hospital	Outpatient Services
Numerator Statement	<p>For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.</p>	<p>At least one medication review conducted by a prescribing practitioner or clinical pharmacist during the measurement year and the presence of a medication list in the medical record.</p>

<p>Numerator Details</p>	<p>First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.</p> <p>The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:</p> <ol style="list-style-type: none"> 1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission 	<p>This measure can be met using the administrative specification (using administrative claims codes) or the hybrid specification (using administrative claims codes and medical record review).</p> <p>Administrative: Either of the following meet criteria:</p> <ul style="list-style-type: none"> • Both of the following during the same visit during the measurement year where the provider type is a prescribing practitioner or clinical pharmacist: <ul style="list-style-type: none"> o At least one medication review (Medication Review Value Set). o The presence of a medication list in the medical record (Medication List Value Set). • Transitional care management services (Transitional Care Management Services Value Set). <p>Exclude services provided in an acute inpatient setting (Acute Inpatient Value Set; Acute Inpatient POS Value Set).</p> <p>(See corresponding Excel document for the value sets referenced above.)</p> <p>Hybrid: Documentation must come from the same medical record and must include one of the following:</p> <ul style="list-style-type: none"> • A medication list in the medical record, and evidence of a medication review by a prescribing practitioner or clinical pharmacist and the date when it was performed. • Notation that the member is not taking any medication and the date when it was noted. <p>A review of side effects for a single medication at the time of prescription alone is not sufficient. An outpatient visit is not required to meet criteria. Do not include medication lists or medication reviews performed in an acute inpatient setting.</p> <p>Prescribing practitioner is defined as a practitioner with prescribing privileges, including nurse practitioners, physician assistants and other non-MDs who have the authority to prescribe medications.</p>
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	<p>medication list, and therefore does not order it at admission)</p> <p>2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.</p> <p>The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.</p> <p>See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.</p>	
<p>Denominator Statement</p>	<p>The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.</p> <p>So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$</p>	<p>All patients 66 years and older as of the end (e.g., December 31) of the measurement year.</p>

	discrepancies per medication per patient for that hospital for that month.	
Denominator Details	Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.	Use administrative data to identify all patients 66 years and older as of the end of the measurement year.
Exclusions	Patients that are discharged or expire before a gold standard medication list can be obtained.	Exclude members who use hospice services.
Exclusion Details	Please see exclusion listed above.	Exclude members who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began. These members may be identified using various methods, which may include but are not limited to enrollment data, medical record or claims/encounter data (Hospice Value Set).
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.	N/A
Type Score	Continuous variable, e.g. average better quality = lower score	Rate/proportion better quality = higher score
Algorithm	See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation)	<p>Step 1. Determine the eligible population: All patients 66 years and older as of the end (e.g., December 31) of the measurement year.</p> <p>Step 2: Identify the denominator: Exclude any patients who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began.</p> <p>The remainder is the eligible population</p> <p>Step 3: Identify the numerator: Individuals in the denominator who have documentation of at least one medication review conducted by a prescribing practitioner or clinical pharmacist and have a medication list in their medical record.</p> <p>Step 4: Calculate the rate: Numerator/Denominator</p>
Submission items	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized? No</p>	<p>5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge</p> <p>0419 : Documentation of Current Medications in the Medical Record</p>

	<p>5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A</p>	<p>2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient 3317 : Medication Reconciliation on Admission 2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities</p> <p>5a.1 Are specs completely harmonized? Yes</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: See response in 5b.1 (response would not fit in this text box).</p> <p>5b.1 If competing, why superior or rationale for additive value: ANSWER TO 5A.1: NCQA is committed to harmonization across measures and reducing unnecessary burden in measurement. However, it is important to note that the numerator (the specific health care service) being reported in this measure (Measure 0553) differs from many of the other related measures.</p> <p>Measures 0097, 2456, 3317, and 2988 address MEDICATION RECONCILIATION, which is a care service that includes compiling a list of medications the patient is currently taking and comparing it against a second list (generally a physician’s admission, transfer, and/or discharge orders) in order to reconcile discrepancies between the two lists and make sure the patient is prescribed the appropriate medications and to decrease the likelihood of adverse medication interactions.</p> <p>This care service is different from a MEDICATION REVIEW, which is the focus of this submission (Measure 0553). In a medication review, the goal is a critical examination of all the medications a patient is taking with the objective of reaching an agreement with the patient about treatment, optimizing the impact of medicine, and minimizing medication-related problems.</p> <p>A medication review is also different from a simple documentation of current medications in the medical record (the focus of Measure 0419e), because this measure involves a review of medications in addition to a documentation of the patient’s medications in the medical record.</p> <p>Additional differences among the measures include level of accountability and target population, as demonstrated below:</p> <p>0053: Care for Older Adults – Medication Review Level of accountability: Health plan Target population: Older adults (age 65 years and older)</p> <p>0097: Medication Reconciliation Post Discharge</p>
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	<p>Level of accountability: Health plan Target population: Adults 18+ discharged from hospital 0419e: Documentation of Current Medications in the Medical Record Level of accountability: Individual clinician Target population: Adults 18+ 2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient Level of accountability: Facility (hospital) Target population: Adults 18+ discharged from hospital 3317: Medication Reconciliation on Admission Level of accountability: Facility (hospital) Target population: Adults 18+ admitted to hospital 2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities Level of accountability: Facility (dialysis facility) Target population: Adults permanently assigned to a dialysis facility Evidence of performance gap and relation to risk of adverse events:</p> <ul style="list-style-type: none"> • Many medication errors occur during times of transition, when patients receive medications from different prescribers who lack access to patients’ comprehensive medication list. Conducting medication reconciliation at major care transitions (eg, upon admission, upon discharge) may improve patients’ ability to manage their medication regimen properly and reduce the number of medication errors (Measures #0097, 2456, 3317, 2988). • Older adults are a vulnerable population and are more likely to have multiple comorbid conditions and thus be receiving multiple medications. This places them at higher risk of an adverse medication event, even without a care transition. This supports an annual medication review targeted specifically to older adults (Measure #0053). This measure is more specifically targeted to a vulnerable population and less burdensome to providers than a medication list documented at every medical visit (Measure #0419e). <p>----- ANSWER TO 5b.1: While the other measures generally address a similar focus (medications), no other NQF-endorsed measures address both the same measure focus AND the same target population.</p>
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Comparison of NQF #2456 and NQF #2988

	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient	2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities
Steward	Brigham and Women's Hospital	Kidney Care Quality Alliance (KCQA)
Description	<p>This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.</p> <p>At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.</p>	<p>Percentage of patient-months for which medication reconciliation* was performed and documented by an eligible professional.**</p> <p>* “Medication reconciliation” is defined as the process of creating the most accurate list of all home medications that the patient is taking, including name, indication, dosage, frequency, and route, by comparing the most recent medication list in the dialysis medical record to one or more external list(s) of medications obtained from a patient or caregiver (including patient-/caregiver-provided “brown bag” information), pharmacotherapy information network (e.g., Surescripts), hospital, or other provider.</p> <p>** For the purposes of medication reconciliation, “eligible professional” is defined as: physician, RN, ARNP, PA, pharmacist, or pharmacy technician.</p>
Type	Outcome	Process
Data Source	<p>Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.</p> <p>Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx</p>	<p>Electronic Health Data, Other Dialysis facility medical record; intended for use by CMS in its CROWNWeb ESRD Clinical Data Repository.</p> <p>No data collection instrument provided No data dictionary</p>
Level	Facility	Facility

Setting	Inpatient/Hospital	Post-Acute Care
Numerator Statement	<p>For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.</p>	<p>Number of patient-months for which medication reconciliation was performed and documented by an eligible professional during the reporting period.</p> <p>The medication reconciliation MUST:</p> <ul style="list-style-type: none"> • Include the name or other unique identifier of the eligible professional; <p>AND</p> <ul style="list-style-type: none"> • Include the date of the reconciliation; <p>AND</p> <ul style="list-style-type: none"> • Address ALL known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana); <p>AND</p> <ul style="list-style-type: none"> • Address for EACH home medication: Medication name(1), indication(2), dosage(2), frequency(2), route of administration(2), start and end date (if applicable)(2), discontinuation date (if applicable)(2), reason medication was stopped or discontinued (if applicable)(2), and identification of individual who authorized stoppage or discontinuation of medication (if applicable)(2); <p>AND</p> <ul style="list-style-type: none"> • List any allergies, intolerances, or adverse drug events experienced by the patient. <hr/> <p>1. For patients in a clinical trial, it is acknowledged that it may be unknown as to whether the patient is receiving the therapeutic agent or a placebo.</p> <p>2. “Unknown” is an acceptable response for this field.</p>
Numerator Details	<p>First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the</p>	<p>NUMERATOR STEP 1. For each patient meeting the denominator criteria in the given calculation month, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month:</p> <p>A. Facility attestation that during the calculation month:</p> <ol style="list-style-type: none"> 1. The patient’s most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided “brown-bag” information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled; <p>AND</p>

<p>medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.</p> <p>The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:</p> <ol style="list-style-type: none"> 1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission) 2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at 	<ol style="list-style-type: none"> 2. ALL of the following items were addressed for EACH identified medication: <ol style="list-style-type: none"> a) Medication name; b) Indication (or “unknown”); c) Dosage (or “unknown”); d) Frequency (or “unknown”); e) Route of administration (or “unknown”); f) Start date (or “unknown”); g) End date, if applicable (or “unknown”); h) Discontinuation date, if applicable (or “unknown”); i) Reason medication was stopped or discontinued, if applicable (or “unknown”); and j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or “unknown”); <p>AND</p> <ol style="list-style-type: none"> 3. Allergies, intolerances, and adverse drug events were addressed and documented. <p>B. Date of the medication reconciliation.</p> <p>C. Identity of eligible professional performing the medication reconciliation.</p> <p>NUMERATOR STEP 2. Repeat “Numerator Step 1” for each month of the one-year reporting period to define the final numerator (patient-months).</p>
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	<p>discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.</p> <p>The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.</p> <p>See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.</p>	
<p>Denominator or Statement</p>	<p>The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.</p> <p>So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.</p>	<p>Total number of patient-months for all patients permanently assigned to a dialysis facility during the reporting period.</p>
<p>Denominator or Details</p>	<p>Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.</p>	<p>DENOMINATOR STEP 1. Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility in the given calculation month.</p> <p>DENOMINATOR STEP 2. For all patients included in the denominator in the given calculation month in “Denominator Step 1”, identify and remove all in-center hemodialysis patients who received < 7 dialysis treatments in the calculation month.</p>

		DENOMINATOR STEP 3. Repeat “Denominator Step 1” and “Denominator Step 2” for each month of the one-year reporting period.
Exclusions	Patients that are discharged or expire before a gold standard medication list can be obtained.	In-center patients who receive <7 hemodialysis treatments in the facility during the reporting month.
Exclusion Details	Please see exclusion listed above.	As detailed in “Denominator Step 2” above, transient patients, defined as in-center patients who receive <7 hemodialysis treatments in the facility during the reporting month, are excluded from the measure.
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.	Not applicable.
Type Score	Continuous variable, e.g. average better quality = lower score	Rate/proportion better quality = higher score
Algorithm	See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))	<p>Scores are calculated using the following algorithm. For each calculation month in the one-year reporting period:</p> <ol style="list-style-type: none"> 1. IDENTIFY THE “RAW DENOMINATOR POPULATION” Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility during the given calculation month. 2. REMOVE PATIENTS MEETING MEASURE EXCLUSION CRITERIA TO DEFINE THE “FINAL DENOMINATOR POPULATION” FOR THE CALCULATION MONTH For all patients included in the denominator during the given calculation month in Step 1 above, identify and remove all in-center patients who received < 7 hemodialysis treatments during the given calculation month. 3. IDENTIFY THE “NUMERATOR POPULATION” FOR THE CALCULATION MONTH For each patient remaining in the denominator during the given calculation month after Step 2, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month: <ol style="list-style-type: none"> A. Facility attestation that during the calculation month: <ol style="list-style-type: none"> 1. The patient’s most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided “brown-bag” information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled;

		<p>AND</p> <p>2. ALL of the following items were addressed for EACH identified medication:</p> <ul style="list-style-type: none"> a) Medication name; b) Indication (or “unknown”); c) Dosage (or “unknown”); d) Frequency (or “unknown”); e) Route of administration (or “unknown”); f) Start date (or “unknown”); g) End date, if applicable (or “unknown”); h) Discontinuation date, if applicable (or “unknown”); i) Reason medication was stopped or discontinued, if applicable (or “unknown”); and j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or “unknown”); <p>AND</p> <p>3. Allergies, intolerances, and adverse drug events were addressed and documented.</p> <p>B. Date of medication reconciliation.</p> <p>C. Identity of eligible professional performing medication reconciliation.</p> <p>4. CALCULATE THE PERFORMANCE SCORE FOR THE CALCULATION MONTH</p> <p>Calculate the facility’s performance score for the given calculation month as follows: $\text{Month's Performance Score} = \frac{\text{Month's Final Numerator Population}}{\text{Month's Final Denominator Population}}$</p> <p>5. CALCULATE THE ANNUAL PERFORMANCE SCORE</p> <p>Calculate the facility’s annual performance score as follows: $\text{Facility's Annual Performance Score} = \frac{(\text{Facility's Month 1 Score} + \text{Month 2 Score} + \dots + \text{Month 12 Score})}{12}$</p>
<p>Submission items</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different</p>	<p>5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge 0554 : Medication Reconciliation Post-Discharge (MRP) 2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities is harmonized with existing</p>

<p>than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A</p>	<p>NQF-endorsed medication reconciliation measures in that all similarly specify that the medication reconciliation must address ALL prescriptions, over-the-counters,herbals,vitamin/mineral/dietary (nutritional) supplements AND must contain the medications’ name, dosage, frequency, and route. The KCQA measure, however, is unique among the currently endorsed medication reconciliation measures in that the level of analysis is the dialysis facility. The KCQA measure also moves beyond a single "check/box", specifying multiple components that must be met to be counted as a “success.” It requires the following additional information on each medication, where applicable and known: indication, start and end date, discontinuation date, reason the medication was stopped or discontinued, and identification of the individual who authorized stoppage or discontinuation of the medication. Additionally, given the increasing frequency with which medical marijuana is prescribed, the KCQA measure specifies that this pharmacotherapeutic agent must be addressed during the reconciliation. KCQA believes these additional foci are necessary to ensure the medication reconciliation process is as comprehensive as possible to better identify and effectively address potential sources of adverse drug-related events and not function merely as a single “check-box” measure. Testing demonstrated these data elements are effectively captured and recorded in facility’s electronic medical record systems during the routine medication reconciliation process.</p> <p>5b.1 If competing, why superior or rationale for additive value: Not applicable; this medication management measure is unique in its specific focus on the ESRD population.</p>
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Comparison of NQF #2456 and NQF #3317

	2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient	3317: Medication Reconciliation on Admission
Steward	Brigham and Women's Hospital	Centers for Medicare & Medicaid Services
Description	<p>This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.</p> <p>At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.</p>	<p>Percentage of patients for whom a designated PTA medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization.</p>
Type	Outcome	Process
Data Source	<p>Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.</p> <p>Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx</p>	<p>Electronic Health Records, Paper Medical Records The data dictionary and measure information form that provide instructions for abstracting the data for the measure are included with this application as an attachment. A structured chart abstraction tool with operational data definitions was developed in Microsoft Access for field testing. Prior to implementation, the measure developer will provide a finalized abstraction tool.</p> <p>Available in attached appendix at A.1 No data dictionary</p>
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	<p>For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.</p>	<p>Number of patients for whom a designated Prior to Admission (PTA) medication list was generated by referencing one or more external sources of medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization when the admission date is Day 0.</p>

<p>Numerator Details</p>	<p>First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.</p> <p>The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:</p> <ol style="list-style-type: none"> 1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission 	<p>The numerator is operationalized into three key criteria of the medication reconciliation process that must be met:</p> <ol style="list-style-type: none"> 1. Medications taken by the patient prior to admission are documented on a designated PTA medication list. 2. The PTA medication list is generated using at least one external source to identify the medications taken by the patient prior to admission. 3. All medications listed on the PTA medication list have a reconciliation action to continue, discontinue, or modify by the end of Day 2 of the hospitalization, or if there are no medications on the PTA medication list, the prescriber has signed the document by the end of Day 2 of the hospitalization to indicate his/her review of the PTA medication list. <p>The first criterion requires that the medical record contain a designated PTA Medication List to document medications that the patient is taking prior to admission. Documenting PTA medications in a designated location eliminates the potential for duplicative or inconsistent documentation of medication histories, avoids the potential for omitted medications, and provides a master source of PTA medication for easy reference by providers. PTA medications may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This criterion aligns with one of the five elements of The Joint Commission’s National Patient Safety Goal (NPSG.03.06.01) on medication reconciliation (The Joint Commission, 2016).</p> <p>The second criterion requires that facilities consult at least one source external to the facility’s records to increase comprehensive capture of all active medications on the PTA medication list. Incomplete or inaccurate PTA medication lists may result in inadequate medication reconciliation actions by the prescriber, which may lead to medication errors and ADEs. Given the absence of a single, accurate source of information on PTA medications (gold standard), the measure establishes a minimum standard for compiling PTA medication information rather than being prescriptive regarding which sources should be referenced. This requirement also aligns with other existing NQF-endorsed measures that focus on medication reconciliation. The measure allows for a wide-range of external sources to account for situations where the routinely consulted source fails to generate the information needed. For example, the patient may not be able or willing to provide information on PTA medications or a retail pharmacy may be closed or not willing to disclose PTA medications without obtaining prior patient consent. Therefore, to meet the External Source requirement, the facility can reference one or more of the following sources to compile the PTA medication list:</p> <ul style="list-style-type: none"> • Interview of the patient or patient proxy such as a caregiver
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	<p>medication list, and therefore does not order it at admission)</p> <p>2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.</p> <p>The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.</p> <p>See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.</p>	<ul style="list-style-type: none"> • Medication container brought in by patient or patient proxy • Medication list brought by patient or patient proxy • Patient support network, such as a group home • Nursing home • Outpatient prescriber or emergency department • Retail pharmacy • Prescription Drug Monitoring Program (PDMP) • Electronic prescribing network system (e.g., Allscripts®, Surescripts®) or aggregate pharmacy billing records (such as, claims data using state/federal healthcare plans) <p>The third and final criterion requires that a licensed prescriber reconciles each medication on the PTA Medication List by the end of Day 2 of the hospitalization and documents whether the medication should be continued, discontinued, or modified. The date of admission is considered Day 0 and subsequent days are considered Day 1 and Day 2 for this measure. If there are no medications on the PTA medication list, the prescriber must sign the document by the end of Day 2 of the hospitalization to indicate his or her review of the PTA medication list for consideration in future treatment decisions. For example, information that indicates the patient is not taking any medications may be important to communicate to the treatment team because there may be a need to initiate treatment of indications that are discovered during admission. Signing the PTA medication list by the end of Day 2 of the hospitalization for patient admissions with no PTA medications also helps to improve communication between members of the care team and other providers during care transitions. To simplify chart abstraction and prevent abstractors from having to distinguish between medications, herbal supplements, and other remedies a patient might take, all entries on the PTA medication list must be reconciled to meet the requirements of the third criterion.</p> <p>For additional details on each of the data elements included in the measure construct, refer to Appendix A.1, which includes the Data Dictionary and Data Collection Tool.</p> <p>Citations</p> <p>*The Joint Commission. (2016). National patient safety goals effective January 1, 2017: Hospital Accreditation Program. Retrieved from https://www.jointcommission.org/assets/1/6/NPSG_Chapter_HAP_Jan2017.pdf</p>
<p>Denominator Statement</p>	<p>The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all</p>	<p>All patients admitted to an inpatient facility from home or a non-acute setting.</p>

	<p>adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.</p> <p>So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.</p>	
Denominator Details	<p>Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.</p>	<p>All adult and pediatric patients admitted to an IPF are eligible to be sampled, regardless of insurance types.</p>
Exclusions	<p>Patients that are discharged or expire before a gold standard medication list can be obtained.</p>	<p>The measure applies two exclusion criteria to ensure that it is feasible to complete the medication reconciliation process on admission to the IPF:</p> <ol style="list-style-type: none"> 1. Patients transferred from an acute care setting 2. Patient admissions with a length of stay less than or equal to 2 days
Exclusion Details	<p>Please see exclusion listed above.</p>	<p>Transfer from an Acute Care Setting: The first exclusion criterion applies to patient admissions that result from a transfer from an acute care setting, such as another inpatient facility or inpatient unit. This exclusion is applied because medication reconciliation with outpatient medications may have been done at the transferring facility and different medication reconciliation processes are required at the receiving IPF for those admissions to focus on the regimen that was used in the transferring facility. Patient admissions from long-term care facilities and emergency departments are not considered transfers and are included in the denominator for the measure.</p> <p>Length of Stay Less than or Equal to 2 Days: The second exclusion criterion applies to patient admissions with lengths of stay shorter than the time needed to adequately complete the medication reconciliation process. The timeframe from admission needed to complete the medication reconciliation process was discussed with the TEP, which recommended a requirement to complete reconciliation by the end of Day 2 if the day of admission is Day 0. They cited instances where patients are admitted on weekends and outpatient providers are not available to ascertain PTA medications or where patients are not</p>

		stable enough to provide information immediately upon admission. The measure developer also evaluated this timeframe empirically using the field testing data to determine when most facilities could complete the medication reconciliation process. Table 2b2.2 in the NQF Measure Testing Form contains all records with complete medication reconciliation for all medications on the PTA medication list and shows the percentage of those records that had completed the medication reconciliation in one day increments of time from admission. This analysis confirmed the appropriateness of the 2-day timeframe for completing the medication reconciliation process.
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification
Stratification	Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.	Not applicable because this measure is not stratified.
Type Score	Continuous variable, e.g. average better quality = lower score	Rate/proportion better quality = higher score
Algorithm	See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))	<p>To calculate the performance score:</p> <ol style="list-style-type: none"> 1. Start processing. Run cases that are included in the Initial Patient Population as follows: <ol style="list-style-type: none"> a. Find the patients that the performance measure is designed to address (all adult and pediatric patients admitted to the inpatient facility from home or a non-acute setting with a length of stay greater than two days). 2. Check Length of Stay (calculated as the Discharge Date minus the Admission Date). <ol style="list-style-type: none"> a. If the Length of Stay is greater 2 days, continue processing and proceed to Transfer From an Acute Care Setting. b. If the Length of Stay is less than or equal to 2 days, the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing. 3. Check Transfer From an Acute Care Setting. <ol style="list-style-type: none"> a. If the Transfer From an Acute Care Setting is equal to 1 (Yes), the case was admitted from a transfer from an acute care setting and the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing.

		<p>b. If the Transfer From an Acute Care Setting is equal to 2 (No), the case was admitted from an admission source other than an acute case setting. Continue processing and proceed to Designated PTA Medication List.</p> <p>4. Check Designated PTA Medication List.</p> <p>a. If the Designated PTA Medication List is equal to 1 (Yes), continue processing and proceed to External Source.</p> <p>b. If the Designated PTA Medication List is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.</p> <p>5. Check External Source.</p> <p>a. If External Source is equal to 1 (Yes), continue processing and proceed to Reconciliation Action.</p> <p>b. If External Source is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.</p> <p>6. Check Reconciliation Action.</p> <p>a. If Reconciliation Action is equal to 1 (Yes) or 3 (N/A), continue processing and proceed to Reconciliation Action by End of Day 2.</p> <p>b. If Reconciliation Action is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.</p> <p>7. Check Reconciliation Action by the end of Day 2 when the Admission date is Day 0.</p> <p>a. If Reconciliation Action by End of Day 2 is equal to 1 (Yes), the record will proceed to Measure Category Assignment of E and will be in the Numerator Population. Stop processing.</p> <p>b. If Reconciliation Action by End of Day 2 is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.</p>
<p>Submission items</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized? No</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which</p>	<p>5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge 0293 : Medication Information 0553 : Care for Older Adults (COA) – Medication Review 0646 : Reconciled Medication List Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care) 2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities</p> <p>5a.1 Are specs completely harmonized? Yes</p>

	<p>focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A</p>	<p>5a.2 If not completely harmonized, identify difference, rationale, impact: The Measure Developer evaluated existing measures in the NQF portfolio to determine whether the Medication Reconciliation on Admission measure would compete with existing measures. Among the five NQF-endorsed measures that evaluate the medication reconciliation process, three (NQF #0097, #0553, #2988) are specified for the outpatient setting and the two (NQF #0293 and #0646) that are specified for the inpatient setting focus on communication of information at discharge. Therefore, the Medication Reconciliation on Admission measure is the only measure that evaluates medication reconciliation on admission to an inpatient facility. To align definitions with other measures that establish a designated timeframe by which a given process must be completed from admission, the Measure Developer harmonized the Medication Reconciliation on Admission measure timeframes with the timeframe specifications of SUB-1 Alcohol Use Screening (NQF 1661) and TOB-1 Tobacco Use Screening (NQF 1651), developed by The Joint Commission. Both measures define the length of stay in calendar days. Standardizing definitions for calculating length of stay using the admission and discharge dates without factoring-in the admission and discharge times will not only help reduce confusion across measures but also help to improve the reliability of the measure scores by eliminating the need to capture times, which were found to be unreliable during field testing. To develop the three data elements associated with the medication reconciliation process, the Measure Developer compared the conceptual descriptions and definitions of five NQF-endorsed measures (NQF 0553, NQF 2988, NQF 0293, NQF 0646, and NQF 0097) that evaluate the medication reconciliation process. Four of the five measures explicitly require a designated medication list. For this measure, the Measure Developer operationalized that requirement with the Designated PTA Medication List data element. Of the three measures that required collection of medications, two had requirements for the types of sources that should be referenced to compile the list. For the Medication Reconciliation on Admission measure, the Measure Developer set to establish a minimum standard and aligned with the approach to require “one or more external sources.” While several measures required the type of information to be collected on each medication, the Measure Developer decided not to include those data elements in this measure given the high performance and low variation for those data elements in testing. Each of the measures defines the process of reconciling the medications on the list differently. The Measure Developer incorporated aspects of each definition that are most applicable to the IPF setting. For example, the Measure Developer aligned with measures that require that the reconciliation be completed by a prescriber and that there be documentation of whether each medication be continued, modified, or discontinued. Finally, the Measure Developer considered different approaches to scoring the measure. Four of</p>
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		<p>the five NQF-endorsed measures require that all aspects of the medication reconciliation process be completed for a patient to pass the measure. The fifth measure evaluates the number of patient months for which the medication reconciliations were completed, however, this is only applicable in the outpatient setting. Therefore, the Measure Developer aligned the scoring approach to produce measure scores that represent the percentage of patient admissions that meet all the medication reconciliation criteria.</p> <p>5b.1 If competing, why superior or rationale for additive value: This measure complements other existing measures because it focuses on the completion of the medication reconciliation process by the end of Day 2 of the hospitalization to the facility, which is not addressed by any existing measure. Medication reconciliation on admission is important to inform accurate medication reconciliation at discharge, which is evaluated by two of the existing measures. Medication reconciliation on admission also ensures that efforts to reconcile medications in the outpatient setting are continued at the transition to the inpatient setting.</p>
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Comparison of NQF #3533e and NQF #3503e

	3533e: Hospital Harm Severe Hyperglycemia	3503e: Hospital Harm Severe Hypoglycemia
Steward	Centers for Medicare & Medicaid Services (CMS)	Centers for Medicare & Medicaid Services (CMS)
Description	<p>This ratio electronic clinical quality measure (eCQM) assesses the number of hospital days with a severe hyperglycemic event (a blood glucose result >300 mg/dL, or a day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is \geq200 mg/dL) per the total qualifying hospital days among inpatient encounters for patients 18 years and older who have either:</p> <ol style="list-style-type: none"> 1. A diagnosis of diabetes mellitus, 2. Received at least one administration of insulin or an anti-diabetic medication during the hospital admission, <p>or</p>	<p>This electronic clinical quality measure (eCQM) assesses the proportion of inpatient admissions for patients aged 18 years and older who received at least one antihyperglycemic medication during their hospitalization, and who suffered a severe hypoglycemic event (blood glucose less than 40 mg/dL) within 24 hours of the administration of an antihyperglycemic agent.</p>

	3. Had an elevated blood glucose level (>200 mg/dL) during their hospital admission.	
Type	Outcome	Outcome
Data Source	Electronic Health Records Hospitals collect EHR data using certified electronic health record technology (CEHRT). The measure authoring tool (MAT) output, which includes the human readable and XML artifacts of the clinical quality language (CQL) for the eQIM are contained in the specifications attached. No additional tools are used for data collection for eQIMs. No data collection instrument provided Attachment Hospital_Harm_Hyperglycemia_Feasibility_Scorecard.xlsx	Electronic Health Records Hospitals collect EHR data using certified electronic health record technology (CEHRT). The MAT output, which includes the human readable and XML artifacts of the clinical quality language (CQL) for the measure are contained in the eQIM specifications attached. No additional tools are used for data collection for eQIMs. No data collection instrument provided Attachment Del18c2HOP5HarmsHypoFeasibilityScorecard12172018_v02.xlsx
Level	Facility	Facility
Setting	Inpatient/Hospital	Inpatient/Hospital
Numerator Statement	The total number of hyperglycemic days across all encounters divided by the total number of eligible days across all encounters. Hospital days are measured in 24-hour periods, starting from the time of arrival at the hospital (including Emergency Department). Days with a hyperglycemic event are defined as: - A day with at least one blood glucose value >300 mg/dL; or - A day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is >=200 mg/dL. We do not count >300 mg/DL events the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before discharge, if it was less than 24 hours.	The number of inpatient admissions during which a test for blood glucose with a result less than 40 mg/dL (severe hypoglycemia) where the event follows the administration of an antihyperglycemic medication within 24 hours.
Numerator Details	This is an eQIM, and therefore uses electronic health record (EHR) data to calculate the measure score. The 24-hour window for data collection is during an inpatient hospitalization, beginning at hospital arrival (whether through the Emergency Department, observation stay, or direct admission to inpatient).	This is an eQIM, and therefore uses electronic health record data to calculate the measure score. The time period for data collection is during an inpatient hospitalization, beginning at hospital arrival (whether through Emergency Department, observation stay, or directly admitted as inpatient). All data elements necessary to calculate this measure are defined within value sets available in the VSAC, and listed below.

	<p>All data elements necessary to calculate this eCQM are defined within value sets available in the Value Set Authority Center (VSAC) and listed below.</p> <p>Glucose tests are represented by LOINC codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134). Codes include laboratory and point-of-care glucose tests, including glucose in blood, serum or plasma, venous blood, and arterial blood; and fasting glucose in venous blood and serum or plasma.</p> <p>To access the value sets for the eCQM, please visit the Value Set Authority Center (VSAC), sponsored by the National Library of Medicine, at https://vsac.nlm.nih.gov/.</p>	<p>Glucose tests are represented by LOINC Codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134). Codes include both laboratory and point-of-care glucose tests, including venous or arterial blood and serum or plasma.</p> <p>The antihyperglycemic medications are defined by the value set of Hypoglycemics (2.16.840.1.113762.1.4.1179.3). This value set includes medications and insulin capable of causing hypoglycemia in a patient.</p> <p>To access the value sets for the measure, please visit the Value Set Authority Center (VSAC), sponsored by the National Library of Medicine, at https://vsac.nlm.nih.gov/.</p>
<p>Denominator Statement</p>	<p>The initial population is all patients 18 years and older at the start of the measurement period with a discharged inpatient hospital admission during the measurement period, as well as either:</p> <ol style="list-style-type: none"> 1. A diagnosis of diabetes that starts before or during the encounter; or 2. Administration of at least one dose of insulin or any anti-diabetic medication during the encounter; or 3. Presence of at least one blood glucose value >200 mg/dL at any time during the encounter. <p>The eCQM includes inpatient encounters which began in the Emergency Department or in observation status.</p> <p>The denominator is the total number of eligible days across all encounters which match the initial population criteria. We do not count the the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before the discharge, if it was less than 24 hours. By excluding the first 24 hours of admission, we allow for correction of severe hyperglycemia that was present on admission. By excluding the last time period before discharge if it was less than 24 hours, we account for the fact that hospitals may not always be able to check glucose during the last time period, especially if it is only a few hours long.</p>	<p>All patients 18 years or older at the start of the encounter with a discharged inpatient hospital admission during the measurement period who were given at least one antihyperglycemic medication during their hospital stay. The measure includes inpatient admissions which began in the Emergency Department or in observation status.</p>

	Eligible encounters that exceed 10 days are truncated to equal 10 days.	
Denominator Details	<p>This eCQM includes all patients 18 years and older at the start of the measurement period, and all payers. The measurement period is 12 months.</p> <ul style="list-style-type: none"> - Glucose tests are represented by LOINC codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134). - Inpatient Encounters are represented using the value set of SNOMEDCT codes (2.16.840.1.113883.3.666.5.307). - Emergency Department Visits are represented using the value set of SNOMEDCT codes (2.16.840.1.113883.3.117.1.7.1.292). - Observation Services are represented using the value set of SNOMEDCT codes (2.16.840.1.113762.1.4.1111.143). - Patients who were given at least one administration of insulin or any anti-diabetic medication during the encounter are defined by the value set of RXNORM codes (2.16.840.1.113883.3.1260.1.1978). This value set includes medications and insulin capable of causing severe hyperglycemia (blood glucose value >300 mg/dL). - Diabetes are represented using the value set of ICD10CM, ICD9CM, SNOMEDCT codes (2.16.840.1.113883.3.464.1003.103.12.1001). This value set includes patients diagnosed with diabetes before or during the encounter. <p>To access the value sets for the eCQM, please visit the Value Set Authority Center, sponsored by the National Library of Medicine, at https://vsac.nlm.nih.gov/.</p>	<p>This measure includes all encounters aged 18 years and older at the time of admission, and all payers. Measurement period is one year. This measure is at the hospital-by-admission level; only one numerator event is counted per admission.</p> <p>Inpatient Encounters are represented using the value set of Encounter Inpatient (2.16.840.1.113883.3.666.5.307).</p> <p>Emergency Department visits are represented using the value set of Emergency Department Visit (2.16.840.1.113883.3.117.1.7.1.292).</p> <p>Patients who had observation encounters are represented using the value set of Observation Services (2.16.840.1.113762.1.4.1111.143).</p> <p>Encounters who were given at least one antihyperglycemic medication are defined by the value set of Hypoglycemics (2.16.840.1.113762.1.4.1179.3), which also defines the numerator medications. This value set includes medications and insulin capable of causing hypoglycemia in a patient.</p> <p>To access the value sets for the measure, please visit the Value Set Authority Center, sponsored by the National Library of Medicine, at https://vsac.nlm.nih.gov/.</p>
Exclusions	N/A; there are no denominator exclusions.	N/A, there are no denominator exclusions.
Exclusion Details	N/A	N/A
Risk Adjustment	No risk adjustment or risk stratification	No risk adjustment or risk stratification

Stratification	N/A; this eCQM is not stratified.	N/A; this measure is not stratified.
Type Score	Ratio better quality = lower score	Rate/proportion better quality = lower score
Algorithm	<p>Target population: Inpatient encounters, all payers, where individuals are aged 18 years and older at the start of the measurement period and have:</p> <ol style="list-style-type: none"> 1. A diagnosis of diabetes that starts before or during the encounter; or 2. Administration of at least one dose of insulin or any anti-diabetic medication during the encounter; or 3. Presence of at least one blood glucose value >200 mg/dL at any time during the encounter. <p>To create the denominator:</p> <ol style="list-style-type: none"> 1. If the inpatient encounter occurred during the measurement period, go to Step 2. If not, do not include in the denominator. 2. Determine the patient’s age in years. The patient’s age is equal to the measurement period start date minus the birth date. If the patient is at least 18 years old, go to Step 3. If less than 18 years old, do not include in the denominator. 3. Determine if the patient had a diagnosis of diabetes mellitus before or during the hospital encounter, or if the patient was administered at least one dose of insulin or an anti-diabetic medication during the encounter, or if the patient had a glucose level of >200 mg/dL during the hospital encounter. If any of these three conditions exist, then include in the denominator. If not, do not include in the denominator. 4. (As the denominator is measured in days, which are defined as 24-hour periods starting at the time of arrival to the hospital (including the Emergency Department)): if the 24-hour period is not the first 24-hour period of the hospital admission, and is not the last period prior to hospital discharge if less than 24 hours, then include in the denominator. If it is the first 24-hour period or the 	<p>Target population: Inpatient admission encounters, all payer, where individuals are aged 18 years or older at the start of the admission and who were given at least one antihyperglycemic medication during their hospital stay, within the measurement period.</p> <p>To create the denominator:</p> <ol style="list-style-type: none"> 1. If the inpatient admission was during the measurement period, go to Step 2. If not, do not include in measure population. 2. Determine the patient’s age in years. The patient’s age is equal to the admission date minus the birth date. If the patient is 18 years or older, go to Step 3. If less than 18 years old, do not include in the measure population. 3. Determine if there was at least one antihyperglycemic medication (from the Hypoglycemic value set 2.16.840.1.113762.1.4.1179.3) administered during the inpatient hospitalization (including in the Emergency Department or observation stay if later converted into an inpatient admission). If not, do not include in the measure population. <p>To create the numerator, for each encounter identify:</p> <ol style="list-style-type: none"> 1. Any instance of a test for blood glucose with a result less than 40 mg/dL during the encounter is considered a severe hypoglycemic event, including values from either laboratory or Point of Care (POC) testing. 2. For any value less than 40mg/dL, determine if there was an antihyperglycemic medication administered by hospital staff within the 24 hours before the event and during the hospitalization (including emergency department and observation stays contiguous with the admission). If not, do not include in the numerator. <ol style="list-style-type: none"> a. The 24-hour time frame extends from the end of the medication administration to the start of the blood glucose test. 3. For any value less than 40mg/dL, do not include any events (identified in Step 1) if it was followed by a repeat POC test for blood glucose within 5 minutes of the initial test and with a result greater than 80 mg/dL. <ol style="list-style-type: none"> a. Rationale: The measure logic does –not– require a repeat blood glucose test to be performed. The expectation is that in most cases of severe hypoglycemia, the clinical team will be treating the patient and will not immediately repeat the test. However, if the severe hypoglycemic event is suspected to be

	<p>last period prior to discharge that is less than 24 hours, do not include in the denominator.</p> <p>a) By excluding for >300 mg/dL events the first 24 hours of admission, we allow for correction of severe hyperglycemia that was present on admission. By excluding the last time period before discharge if it was less than 24 hours, we account for the fact that hospitals may not always be able to check glucose during the last time period, especially if it is only a few hours long.</p> <p>To create the numerator:</p> <ol style="list-style-type: none"> 1. During any 24-hour period from arrival to the hospital (including the Emergency Department) except for the first 24-hour period and the last period prior to hospital discharge if less than 24 hours, any 24-hour period with a blood glucose level >300 mg/dL; <p>Or</p> <ol style="list-style-type: none"> 2. A 24-hour period in which a blood glucose value was not documented, and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL. <p>If either of these 2 events occur, then include in the numerator. If not, do not include in the numerator.</p>	<p>spurious, for example if the patient is clinically asymptomatic, and a repeat test is performed to confirm that suspicion, this step will remove false positives that can occur in POC testing to ensure hospitals are not penalized for erroneous results. The 5-minute time frame extends from the time that the initial blood glucose test was performed to the time that the repeat blood glucose test was performed.</p> <p>Only the first qualifying severe hypoglycemic event is counted in the numerator, and only one severe hypoglycemic event is counted per encounter.</p>
<p>Submission items</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized?</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: N/A</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A</p>	<p>5.1 Identified measures:</p> <p>5a.1 Are specs completely harmonized?</p> <p>5a.2 If not completely harmonized, identify difference, rationale, impact: N/A</p> <p>5b.1 If competing, why superior or rationale for additive value: N/A</p>

Appendix E2: Related and Competing Measures (narrative format)

Comparison of NQF #0684 and NQF #0138

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Steward

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Centers for Medicare & Medicaid Services

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Centers for Disease Control and Prevention

Description

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) will be calculated among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU).

This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals.

Type

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Outcome

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Outcome

Data Source

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>.

Available at measure-specific web page URL identified in S.1 No data dictionary

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Electronic Health Data, Electronic Health Records, Other, Paper Medical Records NHSN Urinary Tract Infection form; NHSN Denominators for Intensive Care Unit (ICU)/Other Locations (not NICU or SCA) form; NHSN Denominators for Specialty Care Areas/Oncology form.

Available at measure-specific web page URL identified in S.1 Attachment Copy_of_nhsn-data-dictionary.xlsx

Level

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Facility

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Facility, Other, Population : Regional and State

Setting

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Post-Acute Care

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Inpatient/Hospital, Other, Post-Acute Care Oncology hospital

Numerator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Total number of observed healthcare-associated CAUTI among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs).

Numerator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

1. Definition of Infection that is Present on Admission (POA): An infection where all of the elements of an infection definition are present during the two calendar days before the day of admission, the first day of admission (day 1) and/or the day after admission (day 2) and are documented in the medical chart. Infections that are POA should not be reported as healthcare-associated infections (HAI) and are not reported as CAUTI. Symptoms must be documented in the chart by a healthcare professional during the POA time frame (e.g., nursing home documents fever prior to arrival to the hospital, patient reports fever >38.0°C). Physician diagnosis alone cannot be accepted as evidence of a urinary tract infection that is POA.

2. Definition of Healthcare-associated Infection (HAI): Any infection reported to NHSN must meet the definition of an NHSN HAI, that is, a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was not present on admission to the acute care facility. An infection is considered an HAI if the date of event of the NHSN site-

specific infection criterion occurs on or after the 3rd calendar day of admission to an inpatient location where day of admission is calendar day 1. All elements of the site-specific infection criterion must occur during the infection window period.

3. Definition of Infection Window Period: The NHSN Infection Window Period is defined as the 7-days during which all site-specific infection criteria must be met. It includes the day the first positive diagnostic test that is an element of the site-specific infection criterion, was obtained, the 3 calendar days before and the 3 calendar days after.

4. Definition of CAUTI: A UTI (either a Symptomatic Urinary Tract Infection [SUTI], or an asymptomatic bacteremic urinary tract infection [ABUTI]) where an indwelling urinary catheter was in place for more than 2 consecutive days in an inpatient location 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 UTI date of event must be the day of discontinuation or the next calendar day to be catheter-associated.

5. Definition of indwelling 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 or suprapubic catheters unless a indwelling urinary catheter is also present. Indwelling urethral catheters that are used for intermittent or continuous irrigation are included in CAUTI surveillance.

6. NHSN UTI criteria: Symptomatic Urinary Tract Infection criteria or Asymptomatic Bacteremic Urinary Tract Infection criteria. See below:

A Symptomatic Urinary Tract Infection (SUTI) that is catheter associated must meet A) or B) below:

A) 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 as an inpatient on the date of event (day of device placement = Day 1) 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) (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 UTI criterion must occur during the Infection Window Period (See Definition Chapter 2 Identifying HAIs in NHSN).

† When entering event into NHSN choose “INPLACE” for Risk Factor for Urinary Catheter

‡ When entering event into NHSN choose “REMOVE” for Risk Factor for Urinary Catheter

*With no other recognized cause (see Comments)

^ These symptoms cannot be used when catheter is in place. An indwelling urinary catheter in place could cause patient complaints of “frequency” “urgency” or “dysuria”.

B) Patient must meet 1, 2, and 3 below:

1. Patient is ≥ 1 year of age

2. Patient has at least one of the following signs or symptoms:

- fever ($>38.0^\circ\text{C}$)
- hypothermia ($<36.0^\circ\text{C}$)
- apnea*
- bradycardia*
- lethargy*
- vomiting*
- suprapubic tenderness*

3. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml. All elements of the SUTI criterion must occur during the Infection Window Period

*With no other recognized cause

‡ If patient had an indwelling urinary catheter in place for more than 2 consecutive days in an inpatient location, and catheter was in place on the date of event or the previous day the CAUTI criterion is met. If no such indwelling urinary catheter was in place, UTI (non-catheter associated) criterion is met.

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.

An Asymptomatic Bacteremic Urinary Tract Infection (ABUTI) that is catheter associated must meet the following:

Patient must meet 1, 2, and 3 below:

1. Patient has no signs or symptoms of SUTI 1 or 2 according to age

2. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml

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).

** 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)).

7. Definition of Location of Attribution: The inpatient location where the patient was assigned on the date of the UTI event.

8. Definition of Date of Event: The date when the first element used to meet the UTI criterion occurred during the infection window period.

9. Definition of Repeat Infection Timeframe (RIT): The RIT is a 14-day timeframe during which no new infections of the same type are reported. The date of event is Day 1 of the 14-day RIT. Additional pathogens recovered during the RIT from the same type of infection are added to the event. The RIT will apply at the level of specific type of infection with the exception of BSI, UTI, and PNEU where the RIT will apply at the major type of infection.

Denominator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline Data is calculated using the facility's number of catheter days and the following significant risk factors:

- Acute Care Hospitals: CDC Location, Facility bed size, Medical school affiliation, and Facility type
- Critical Access Hospitals: Medical school affiliation
- Long-Term Acute Hospitals: Average length of stay, Setting type, and Location type
- Inpatient Rehabilitation Facilities: Setting type, Proportion of admissions with traumatic and non-traumatic spinal cord dysfunction, Proportion of admissions with stroke

Denominator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their

cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Numbers of indwelling urinary catheter days attributed to each location are counted for each data period using the following definitions and guidelines. All indwelling urinary catheter days for each location and data period are summed.

1. Definition of indwelling catheter day: For each patient, a day that an indwelling urinary catheter was present at the time of the indwelling urinary catheter day count.
2. CDC Location (acute care hospitals, long term acute care hospitals): Each patient care area in a facility that is monitored in NHSN is “mapped” to one or more CDC Locations. The specific CDC Location code is determined by the type of patients cared for in that area according to the 80% Rule. That is, if 80% of patients are of a certain type (e.g., pediatric patients with orthopedic problems) then that area is designated as that type of location (in this case, an Inpatient Pediatric Orthopedic Ward).
https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf
3. Medical school affiliation categories:
 - a. Major – facility has a program for medical students and post-graduate medical training
 - b. Graduate – facility has a program for post-graduate medical training (i.e., residency and/or fellowships)
 - c. Undergraduate: facility has a program for medical students only
4. Facility bedsize: Number of beds set up and staffed in the healthcare facility
5. Setting (Freestanding or Within a Hospital): Describes physical placement of LTACH or IRF and does not define financial or administrative relationship with other healthcare facility types.
6. Definition for Facility Physician Education Status: Teaching statuses: major, graduate, undergraduate - Major: Facility has a program for medical students and post-graduate medical training; Graduate: Facility has a program for post-graduate medical training (i.e., residency and/or fellowships); Undergraduate: Facility has a program for medical students only.
7. Proportion of admissions within a diagnostic category: number of admissions during the calendar year where the primary diagnosis of that type (e.g. traumatic spinal cord dysfunction) divided by the total number of admissions during the calendar year

Exclusions

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

The following are not considered indwelling catheters by NHSN definitions:

1. Suprapubic catheters
2. Condom catheters
3. "In and out" catheterizations
4. Nephrostomy tubes

Note, that if a patient has either a nephrostomy tube or a suprapubic catheter and also has an indwelling urinary catheter, the indwelling urinary catheter will be included in the CAUTI surveillance.

Exclusion Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

A resident is excluded from the denominator if:

1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]).
2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

See S. 10

Risk Adjustment

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

No risk adjustment or risk stratification

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Statistical risk model

Stratification

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This is not applicable; this measure is not stratified.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

CAUTI data is stratified by facility-specific and individual patient location data (i.e., bedsize of location, affiliation and level of affiliation with a medical school [Teaching statuses: major, graduate, undergraduate, not affiliated - See definitions S.7. above.

Type Score

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Rate/proportion better quality = lower score

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Ratio better quality = lower score

Algorithm

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).

Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.

Step 3: Divide the results of step 2 by the results of step 1.

Step 4: Multiply the result of step 3 by 100 to obtain a percent value.

A description of the time period for the data included in this measure is provided in S.5 above.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

The Standardized Infection Ratio (SIR) for annual and quarterly data aggregation and analysis of CAUTI events is calculated for each healthcare facility for a specified time period. The SIR is an indirect standardization method for summarizing healthcare associated infection (HAI) experience, including CAUTI events, in a single group of data or across any number of stratified groups of data. To produce the SIR:

1. Identify number of observed healthcare-associated CAUTIs for a given time period by adding the total number of observed CAUTIs across the facility.
2. Calculate the number of predicted healthcare-associated CAUTIs for each CDC location using a negative binomial regression model and the risk factors described above.
3. Calculate the number of predicted healthcare-associated CAUTIs for the facility and time period by adding the predicted number of CAUTIs for each location across the facility.
4. Divide the number of observed healthcare-associated CAUTIs (1 above) by the number of predicted healthcare-associated CAUTIs (3 above) to obtain the SIR.
5. Perform a Poisson test to compare the SIR obtained in 4 above to the nominal value of 1. P-value and confidence interval will be calculated, which can be used to assess significance of SIR.

(The NHSN analysis tool will perform the calculations once the patient infection data, denominator information, and related facility-level information are entered into the system.)

The Adjusted Ranking Metric (ARM) for annual data aggregation and analysis of HAI events, including CAUTI events, combines the method of indirect standardization used to calculate the unadjusted SIR described above with a Bayesian random effects hierarchical model to account for the potentially low precision and/or reliability inherent in the unadjusted SIR. A Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling is used to produce the adjusted numerator. The ARM enables more meaningful statistical differentiation between hospitals by accounting for differences in patient case-mix, exposure volume (e.g. patient days, indwelling urinary catheter days, central line-days, surgical procedure volume), and unmeasured factors that are not reflected in the unadjusted SIR and that cause variation between healthcare facilities. Accounting for these sources of variability enables better measure discrimination between facilities and leads to more reliable performance rankings. To produce the ARM:

1. Identify the number of CAUTI in each location
2. Obtain the adjusted number of observed CAUTIs by using a Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling which results from a Bayesian random effects model.
3. Total these numbers for an observed number of CAUTIs
4. Obtain the predicted number of CAUTIs in the same locations by multiplying the observed indwelling urinary catheter days according to the factors significantly associated with predicting CAUTI incidence as identified through a Log-linear Negative Binomial Regression Model.
5. Divide the total number of adjusted CAUTI events (“3” above) by the predicted number of CAUTIs (“4” above).
6. Result = ARM

*Submission items***0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)**

5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

0281 : Urinary Tract Infection Admission Rate (PQI 12)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers' efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient's leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).

5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target

population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value:

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Steward

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Centers for Medicare & Medicaid Services

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Centers for Disease Control and Prevention

Description

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) will be calculated among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU).

This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals.

Type

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Outcome

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Outcome

Data Source

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>.

Available at measure-specific web page URL identified in S.1 No data dictionary

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Electronic Health Data, Electronic Health Records, Other, Paper Medical Records NHSN Urinary Tract Infection form; NHSN Denominators for Intensive Care Unit (ICU)/Other Locations (not NICU or SCA) form; NHSN Denominators for Specialty Care Areas/Oncology form.

Available at measure-specific web page URL identified in S.1 Attachment Copy_of_nhsn-data-dictionary.xlsx

Level

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Facility

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Facility, Other, Population : Regional and State

Setting

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Post-Acute Care

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Inpatient/Hospital, Other, Post-Acute Care Oncology hospital

Numerator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Total number of observed healthcare-associated CAUTI among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs).

Numerator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

1. Definition of Infection that is Present on Admission (POA): An infection where all of the elements of an infection definition are present during the two calendar days before the day of admission, the first day of admission (day 1) and/or the day after admission (day 2) and are documented in the medical chart. Infections that are POA should not be reported as healthcare-associated infections (HAI) and are not reported as CAUTI. Symptoms must be documented in the chart by a healthcare professional during

the POA time frame (e.g., nursing home documents fever prior to arrival to the hospital, patient reports fever >38.0°C). Physician diagnosis alone cannot be accepted as evidence of a urinary tract infection that is POA.

2. Definition of Healthcare-associated Infection (HAI): Any infection reported to NHSN must meet the definition of an NHSN HAI, that is, a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was not present on admission to the acute care facility. An infection is considered an HAI if the date of event of the NHSN site-specific infection criterion occurs on or after the 3rd calendar day of admission to an inpatient location where day of admission is calendar day 1. All elements of the site-specific infection criterion must occur during the infection window period.

3. Definition of Infection Window Period: The NHSN Infection Window Period is defined as the 7-days during which all site-specific infection criteria must be met. It includes the day the first positive diagnostic test that is an element of the site-specific infection criterion, was obtained, the 3 calendar days before and the 3 calendar days after.

4. Definition of CAUTI: A UTI (either a Symptomatic Urinary Tract Infection [SUTI], or an asymptomatic bacteremic urinary tract infection [ABUTI]) where an indwelling urinary catheter was in place for more than 2 consecutive days in an inpatient location 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 UTI date of event must be the day of discontinuation or the next calendar day to be catheter-associated.

5. Definition of indwelling 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 or suprapubic catheters unless a indwelling urinary catheter is also present. Indwelling urethral catheters that are used for intermittent or continuous irrigation are included in CAUTI surveillance.

6. NHSN UTI criteria: Symptomatic Urinary Tract Infection criteria or Asymptomatic Bacteremic Urinary Tract Infection criteria. See below:

A Symptomatic Urinary Tract Infection (SUTI) that is catheter associated must meet A) or B) below:

A) 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 as an inpatient on the date of event (day of device placement = Day 1) 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) (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 UTI criterion must occur during the Infection Window Period (See Definition Chapter 2 Identifying HAIs in NHSN).

† When entering event into NHSN choose “INPLACE” for Risk Factor for Urinary Catheter

‡ When entering event into NHSN choose “REMOVE” for Risk Factor for Urinary Catheter

*With no other recognized cause (see Comments)

^ These symptoms cannot be used when catheter is in place. An indwelling urinary catheter in place could cause patient complaints of “frequency” “urgency” or “dysuria”.

B) Patient must meet 1, 2, and 3 below:

1. Patient is ≥ 1 year of age
2. Patient has at least one of the following signs or symptoms:
 - fever ($>38.0^\circ\text{C}$)
 - hypothermia ($<36.0^\circ\text{C}$)
 - apnea*
 - bradycardia*
 - lethargy*
 - vomiting*
 - suprapubic tenderness*

3. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml. All elements of the SUTI criterion must occur during the Infection Window Period

*With no other recognized cause

‡ If patient had an indwelling urinary catheter in place for more than 2 consecutive days in an inpatient location, and catheter was in place on the date of event or the previous day the CAUTI criterion is met. If no such indwelling urinary catheter was in place, UTI (non-catheter associated) criterion is met.

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.

An Asymptomatic Bacteremic Urinary Tract Infection (ABUTI) that is catheter associated must meet the following:

Patient must meet 1, 2, and 3 below:

1. Patient has no signs or symptoms of SUTI 1 or 2 according to age

2. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml

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).

** 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)).

7. Definition of Location of Attribution: The inpatient location where the patient was assigned on the date of the UTI event.

8. Definition of Date of Event: The date when the first element used to meet the UTI criterion occurred during the infection window period.

9. Definition of Repeat Infection Timeframe (RIT): The RIT is a 14-day timeframe during which no new infections of the same type are reported. The date of event is Day 1 of the 14-day RIT. Additional pathogens recovered during the RIT from the same type of infection are added to the event. The RIT will apply at the level of specific type of infection with the exception of BSI, UTI, and PNEU where the RIT will apply at the major type of infection.

Denominator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline Data is calculated using the facility's number of catheter days and the following significant risk factors:

- Acute Care Hospitals: CDC Location, Facility bed size, Medical school affiliation, and Facility type
- Critical Access Hospitals: Medical school affiliation
- Long-Term Acute Hospitals: Average length of stay, Setting type, and Location type
- Inpatient Rehabilitation Facilities: Setting type, Proportion of admissions with traumatic and non-traumatic spinal cord dysfunction, Proportion of admissions with stroke

*Denominator Details***0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)**

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Numbers of indwelling urinary catheter days attributed to each location are counted for each data period using the following definitions and guidelines. All indwelling urinary catheter days for each location and data period are summed.

1. Definition of indwelling catheter day: For each patient, a day that an indwelling urinary catheter was present at the time of the indwelling urinary catheter day count.
2. CDC Location (acute care hospitals, long term acute care hospitals): Each patient care area in a facility that is monitored in NHSN is “mapped” to one or more CDC Locations. The specific CDC Location code is determined by the type of patients cared for in that area according to the 80% Rule. That is, if 80% of patients are of a certain type (e.g., pediatric patients with orthopedic problems) then that area is designated as that type of location (in this case, an Inpatient Pediatric Orthopedic Ward).
https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf
3. Medical school affiliation categories:
 - a. Major – facility has a program for medical students and post-graduate medical training
 - b. Graduate – facility has a program for post-graduate medical training (i.e., residency and/or fellowships)
 - c. Undergraduate: facility has a program for medical students only
4. Facility bedsize: Number of beds set up and staffed in the healthcare facility
5. Setting (Freestanding or Within a Hospital): Describes physical placement of LTACH or IRF and does not define financial or administrative relationship with other healthcare facility types.
6. Definition for Facility Physician Education Status: Teaching statuses: major, graduate, undergraduate - Major: Facility has a program for medical students and post-graduate medical training; Graduate: Facility has a program for post-graduate medical training (i.e., residency and/or fellowships); Undergraduate: Facility has a program for medical students only.
7. Proportion of admissions within a diagnostic category: number of admissions during the calendar year where the primary diagnosis of that type (e.g. traumatic spinal cord dysfunction) divided by the total number of admissions during the calendar year

Exclusions

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

The following are not considered indwelling catheters by NHSN definitions:

1. Suprapubic catheters
2. Condom catheters
3. "In and out" catheterizations
4. Nephrostomy tubes

Note, that if a patient has either a nephrostomy tube or a suprapubic catheter and also has an indwelling urinary catheter, the indwelling urinary catheter will be included in the CAUTI surveillance.

Exclusion Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

A resident is excluded from the denominator if:

1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]).
2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

See S. 10

Risk Adjustment

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

No risk adjustment or risk stratification

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Statistical risk model

Stratification

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This is not applicable; this measure is not stratified.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

CAUTI data is stratified by facility-specific and individual patient location data (i.e., bedsize of location, affiliation and level of affiliation with a medical school [Teaching statuses: major, graduate, undergraduate, not affiliated - See definitions S.7. above.

Type Score

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Rate/proportion better quality = lower score

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Ratio better quality = lower score

Algorithm

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).

Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.

Step 3: Divide the results of step 2 by the results of step 1.

Step 4: Multiply the result of step 3 by 100 to obtain a percent value.

A description of the time period for the data included in this measure is provided in S.5 above.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

The Standardized Infection Ratio (SIR) for annual and quarterly data aggregation and analysis of CAUTI events is calculated for each healthcare facility for a specified time period. The SIR is an indirect standardization method for summarizing healthcare associated infection (HAI) experience, including CAUTI events, in a single group of data or across any number of stratified groups of data. To produce the SIR:

1. Identify number of observed healthcare-associated CAUTIs for a given time period by adding the total number of observed CAUTIs across the facility.
2. Calculate the number of predicted healthcare-associated CAUTIs for each CDC location using a negative binomial regression model and the risk factors described above.
3. Calculate the number of predicted healthcare-associated CAUTIs for the facility and time period by adding the predicted number of CAUTIs for each location across the facility.
4. Divide the number of observed healthcare-associated CAUTIs (1 above) by the number of predicted healthcare-associated CAUTIs (3 above) to obtain the SIR.
5. Perform a Poisson test to compare the SIR obtained in 4 above to the nominal value of 1. P-value and confidence interval will be calculated, which can be used to assess significance of SIR.

(The NHSN analysis tool will perform the calculations once the patient infection data, denominator information, and related facility-level information are entered into the system.)

The Adjusted Ranking Metric (ARM) for annual data aggregation and analysis of HAI events, including CAUTI events, combines the method of indirect standardization used to calculate the unadjusted SIR described above with a Bayesian random effects hierarchical model to account for the potentially low precision and/or reliability inherent in the unadjusted SIR. A Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling is used to produce the adjusted numerator. The ARM enables more meaningful statistical differentiation between hospitals by accounting for differences in patient case-mix, exposure volume (e.g. patient days, indwelling urinary catheter days, central line-days, surgical procedure volume), and unmeasured factors that are not reflected in the unadjusted SIR and that cause variation between healthcare facilities. Accounting for these sources of variability enables better measure discrimination between facilities and leads to more reliable performance rankings. To produce the ARM:

1. Identify the number of CAUTI in each location
2. Obtain the adjusted number of observed CAUTIs by using a Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling which results from a Bayesian random effects model.
3. Total these numbers for an observed number of CAUTIs
4. Obtain the predicted number of CAUTIs in the same locations by multiplying the observed indwelling urinary catheter days according to the factors significantly associated with predicting CAUTI incidence as identified through a Log-linear Negative Binomial Regression Model.
5. Divide the total number of adjusted CAUTI events (“3” above) by the predicted number of CAUTIs (“4” above).
6. Result = ARM

*Submission items***0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)**

5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

0281 : Urinary Tract Infection Admission Rate (PQI 12)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers' efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient's leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).

5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target

population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value:

Comparison of NQF #0684 and NQF #0281

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

0281: Urinary Tract Infection Admission Rate (PQI 12)

Steward

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Centers for Medicare & Medicaid Services

0281: Urinary Tract Infection Admission Rate (PQI 12)

Agency for Healthcare Research and Quality

Description

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Excludes kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions.

[NOTE: The software provides the rate per population. However, common practice reports the measure as per 100,000 population. The user must multiply the rate obtained from the software by 100,000 to report admissions per 100,000 population.]

Type

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Outcome

0281: Urinary Tract Infection Admission Rate (PQI 12)

Outcome

Data Source

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>.

Available at measure-specific web page URL identified in S.1 No data dictionary

0281: Urinary Tract Infection Admission Rate (PQI 12)

Claims All analyses were completed using data from the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID), 2007-2011. HCUP is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal government to create a national information resource of encounter-level health care data. The HCUP SID contain the universe of the inpatient discharge abstracts in participating States, translated into a uniform format to facilitate multi-State comparisons and analyses. Together, the SID encompass about 97 percent of all U.S. community hospital discharges (in 2011, 46 states participated for a total of more than 38.5 million hospital discharges). As defined by the American Hospital Association, community hospitals are all non-Federal, short-term, general or other specialty hospitals, excluding hospital units of institutions. Veterans hospitals and other Federal facilities are excluded. Taken from the Uniform Bill-04 (UB-04), the SID data elements include ICD-9-CM coded principal and secondary diagnoses and procedures, additional detailed clinical and service information based on revenue codes, admission and discharge status, patient demographics, expected payment source (Medicare, Medicaid, private insurance as well as the uninsured), total charges and length of stay (www.hcup-us.ahrq.gov).

HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2007-2011. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/sidoverview.jsp. (AHRQ QI Software Version 4.5)

Available at measure-specific web page URL identified in S.1 Attachment PQI_12_Urinary_Tract_Infection_Admission_Rate.xlsx

Level

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Facility

0281: Urinary Tract Infection Admission Rate (PQI 12)

Population : Community, County or City, Population : Regional and State

Setting

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Post-Acute Care

0281: Urinary Tract Infection Admission Rate (PQI 12)

Hospital

Numerator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Discharges, for patients ages 18 years and older, with a principal ICD-10-CM diagnosis code for urinary tract infection.

[NOTE: By definition, discharges with a principal diagnosis of urinary tract infection are precluded from an assignment of MDC 14 by grouper software. Thus, obstetric discharges should not be considered in the PQI rate, though the AHRQ QI™ software does not explicitly exclude obstetric cases.]

Numerator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Urinary tract infection diagnosis codes: (ACSUTID)

ICD-10-CM	Description
N10	Acute tubulo-interstitial nephritis
N119	Chronic tubulo-interstitial nephritis, unspecified
N12	Tubulo-interstitial nephritis, not specified as acute or chronic
N151	Renal and perinephric abscess
N159	Renal tubulo-interstitial disease, unspecified
N16	Renal tubulo-interstitial disorders in diseases classified elsewhere
N2884	Pyelitis cystica
N2885	Pyeloureteritis cystica
N2886	Ureteritis cystica
N3000	Acute cystitis without hematuria
N3001	Acute cystitis with hematuria
N3090	Cystitis, unspecified without hematuria
N3091	Cystitis, unspecified with hematuria

NUMERATOR EXCLUSIONS

Exclude cases: transfer from a hospital (different facility); transfer from a Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF); transfer from another health care facility; with any-listed ICD-10-CM diagnosis codes for kidney/urinary tract disorder; with any-listed ICD-10-CM diagnosis codes or any-listed ICD-10-PCS procedure codes for immunocompromised state; with missing

gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), principal diagnosis (DX1=missing), or county (PSTCO=missing)

[For complete list of excluded codes, see attached technical specifications and Prevention Quality Indicators Appendix A – Admission Codes for Transfers and Appendix C – Immunocompromised State Diagnosis and Procedure Codes.]

Denominator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Population ages 18 years and older in metropolitan area † or county. Discharges in the numerator are assigned to the denominator based on the metropolitan area or county of the patient residence, not the metropolitan area or county of the hospital where the discharge occurred.

† The term “metropolitan area” (MA) was adopted by the U.S. Census in 1990 and referred collectively to metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs), and primary metropolitan statistical areas (PMSAs). In addition, “area” could refer to either 1) FIPS county, 2) modified FIPS county, 3) 1999 OMB Metropolitan Statistical Area, or 4) 2003 OMB Metropolitan Statistical Area. Micropolitan Statistical Areas are not used in the QI software.

Denominator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Not Applicable

Exclusions

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Not applicable

Exclusion Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

A resident is excluded from the denominator if:

1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]).
2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Not applicable

Risk Adjustment

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

No risk adjustment or risk stratification

0281: Urinary Tract Infection Admission Rate (PQI 12)

No risk adjustment or risk stratification

Stratification

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This is not applicable; this measure is not stratified.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Not applicable

Type Score

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Rate/proportion better quality = lower score

0281: Urinary Tract Infection Admission Rate (PQI 12)

Rate/proportion better quality = lower score

Algorithm

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).

Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.

Step 3: Divide the results of step 2 by the results of step 1.

Step 4: Multiply the result of step 3 by 100 to obtain a percent value.

A description of the time period for the data included in this measure is provided in S.5 above.

0281: Urinary Tract Infection Admission Rate (PQI 12)

The observed rate is the number of discharges flagged with the outcome of interest divided by the number of persons in the population at risk. The predicted rate is estimated for each person based on a logistic regression model. The expected rate is the average predicted rate for the unit of interest (i.e. the county of residence). The risk-adjusted rate is calculated using the indirect method as observed rate divided by expected rate multiplied by the reference population rate. The performance score is a weighted average of the risk adjusted rate and the reference population rate, where the weight is the signal-to-noise ratio.

Submission items

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

0281 : Urinary Tract Infection Admission Rate (PQI 12)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers' efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient's leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).

5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.

0281: Urinary Tract Infection Admission Rate (PQI 12)

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value: Not applicable

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

0281: Urinary Tract Infection Admission Rate (PQI 12)

Steward

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Centers for Medicare & Medicaid Services

0281: Urinary Tract Infection Admission Rate (PQI 12)

Agency for Healthcare Research and Quality

Description

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Excludes kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions.

[NOTE: The software provides the rate per population. However, common practice reports the measure as per 100,000 population. The user must multiply the rate obtained from the software by 100,000 to report admissions per 100,000 population.]

Type

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Outcome

0281: Urinary Tract Infection Admission Rate (PQI 12)

Outcome

Data Source

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>.

Available at measure-specific web page URL identified in S.1 No data dictionary

0281: Urinary Tract Infection Admission Rate (PQI 12)

Claims All analyses were completed using data from the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID), 2007-2011. HCUP is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, private data organizations, and the Federal government to create a national information resource of encounter-level health care data. The HCUP SID contain the universe of the inpatient discharge abstracts in participating States, translated into a uniform format to facilitate multi-State comparisons and analyses. Together, the SID encompass about 97 percent of all U.S. community hospital discharges (in 2011, 46 states participated for a total of more than 38.5 million hospital discharges). As defined by the American Hospital Association, community hospitals are all non-Federal, short-term, general or other specialty hospitals, excluding hospital units of institutions. Veterans hospitals and other Federal facilities are excluded. Taken from the Uniform Bill-04 (UB-04), the SID data elements include ICD-9-CM coded principal and secondary diagnoses and procedures, additional detailed clinical and service information based on revenue codes, admission and discharge status, patient demographics, expected payment source (Medicare, Medicaid, private insurance as well as the uninsured), total charges and length of stay (www.hcup-us.ahrq.gov).

HCUP State Inpatient Databases (SID). Healthcare Cost and Utilization Project (HCUP). 2007-2011. Agency for Healthcare Research and Quality, Rockville, MD. www.hcup-us.ahrq.gov/sidoverview.jsp. (AHRQ QI Software Version 4.5)

Available at measure-specific web page URL identified in S.1 Attachment PQI_12_Urinary_Tract_Infection_Admission_Rate.xlsx

Level

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Facility

0281: Urinary Tract Infection Admission Rate (PQI 12)

Population : Community, County or City, Population : Regional and State

Setting

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Post-Acute Care

0281: Urinary Tract Infection Admission Rate (PQI 12)

Hospital

Numerator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Discharges, for patients ages 18 years and older, with a principal ICD-10-CM diagnosis code for urinary tract infection.

[NOTE: By definition, discharges with a principal diagnosis of urinary tract infection are precluded from an assignment of MDC 14 by grouper software. Thus, obstetric discharges should not be considered in the PQI rate, though the AHRQ QI™ software does not explicitly exclude obstetric cases.]

Numerator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Urinary tract infection diagnosis codes: (ACSUTID)

ICD-10-CM	Description
N10	Acute tubulo-interstitial nephritis
N119	Chronic tubulo-interstitial nephritis, unspecified
N12	Tubulo-interstitial nephritis, not specified as acute or chronic
N151	Renal and perinephric abscess
N159	Renal tubulo-interstitial disease, unspecified
N16	Renal tubulo-interstitial disorders in diseases classified elsewhere
N2884	Pyelitis cystica
N2885	Pyeloureteritis cystica
N2886	Ureteritis cystica
N3000	Acute cystitis without hematuria
N3001	Acute cystitis with hematuria
N3090	Cystitis, unspecified without hematuria
N3091	Cystitis, unspecified with hematuria

NUMERATOR EXCLUSIONS

Exclude cases: transfer from a hospital (different facility); transfer from a Skilled Nursing Facility (SNF) or Intermediate Care Facility (ICF); transfer from another health care facility; with any-listed ICD-10-CM diagnosis codes for kidney/urinary tract disorder; with any-listed ICD-10-CM diagnosis codes or any-listed ICD-10-PCS procedure codes for immunocompromised state; with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), principal diagnosis (DX1=missing), or county (PSTCO=missing)

[For complete list of excluded codes, see attached technical specifications and Prevention Quality Indicators Appendix A – Admission Codes for Transfers and Appendix C – Immunocompromised State Diagnosis and Procedure Codes.]

Denominator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Population ages 18 years and older in metropolitan area † or county. Discharges in the numerator are assigned to the denominator based on the metropolitan area or county of the patient residence, not the metropolitan area or county of the hospital where the discharge occurred.

† The term “metropolitan area” (MA) was adopted by the U.S. Census in 1990 and referred collectively to metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs), and primary metropolitan statistical areas (PMSAs). In addition, “area” could refer to either 1) FIPS county, 2) modified FIPS county, 3) 1999 OMB Metropolitan Statistical Area, or 4) 2003 OMB Metropolitan Statistical Area. Micropolitan Statistical Areas are not used in the QI software.

Denominator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Not Applicable

Exclusions

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Not applicable

Exclusion Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

A resident is excluded from the denominator if:

1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]).
2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Not applicable

Risk Adjustment

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

No risk adjustment or risk stratification

0281: Urinary Tract Infection Admission Rate (PQI 12)

No risk adjustment or risk stratification

Stratification

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This is not applicable; this measure is not stratified.

0281: Urinary Tract Infection Admission Rate (PQI 12)

Not applicable

Type Score

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Rate/proportion better quality = lower score

0281: Urinary Tract Infection Admission Rate (PQI 12)

Rate/proportion better quality = lower score

Algorithm

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).

Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.

Step 3: Divide the results of step 2 by the results of step 1.

Step 4: Multiply the result of step 3 by 100 to obtain a percent value.

A description of the time period for the data included in this measure is provided in S.5 above.

0281: Urinary Tract Infection Admission Rate (PQI 12)

The observed rate is the number of discharges flagged with the outcome of interest divided by the number of persons in the population at risk. The predicted rate is estimated for each person based on a logistic regression model. The expected rate is the average predicted rate for the unit of interest (i.e. the county of residence). The risk-adjusted rate is calculated using the indirect method as observed rate divided by expected rate multiplied by the reference population rate. The performance score is a weighted average of the risk adjusted rate and the reference population rate, where the weight is the signal-to-noise ratio.

Submission items

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

0281 : Urinary Tract Infection Admission Rate (PQI 12)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers' efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient's leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).

5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.

0281: Urinary Tract Infection Admission Rate (PQI 12)

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value: Not applicable

Comparison of NQF #0684 and NQF #0686

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Steward

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Centers for Medicare & Medicaid Services

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Centers for Medicare & Medicaid Services

Description

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

Type

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Outcome

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Outcome

Data Source

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>.

Available at measure-specific web page URL identified in S.1 No data dictionary

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15.

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>

Available at measure-specific web page URL identified in S.1 No data dictionary

Level

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Facility

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Facility

Setting

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Post-Acute Care

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Post-Acute Care

Numerator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.

Numerator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days (H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

Denominator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.

Denominator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the

selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01, 02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

Exclusions

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.

Exclusion Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

A resident is excluded from the denominator if:

1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]).
2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS readmission/return anticipated assessment (A0310B = [06]), the resident is excluded.

A resident is also excluded if any of the following conditions are true:

- 1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]).
- 2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]).

3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]).
If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

Risk Adjustment

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

No risk adjustment or risk stratification

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Statistical risk model

Stratification

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This is not applicable; this measure is not stratified.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This is not applicable; this measure is not stratified.

Type Score

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Rate/proportion better quality = lower score

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Rate/proportion better quality = lower score

Algorithm

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).

Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.

Step 3: Divide the results of step 2 by the results of step 1.

Step 4: Multiply the result of step 3 by 100 to obtain a percent value.

A description of the time period for the data included in this measure is provided in S.5 above.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows:

Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.

Step 2: Calculate the facility-level observed score (steps 2a through 2b below).

Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).

Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1

Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.

Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)

Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model.

Specifically, the covariates are calculated as follows:

For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):

1. Covariate = [1] if H0400 = [2, 3];
2. Covariate = [0] if H0400 = [0, 1, 9, -]

For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:

1. Covariate = [1] if any of the following are true:
 - a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9].
2. Covariate = [0] if the following is true:
 - a. M0300B1 = [0, -, ^] and
 - b. M0300C1 = [0, -, ^] and
 - c. M0300D1 = [0, -, ^].

*All covariates are missing if no prior assessment is available.

The logistic regression model is of the form:

[Equation 1] QM triggered (yes=1, no=0) = $B_0 + B_1 \cdot COVA + B_2 \cdot COVB$

Where:

B_0 is the logistic regression constant ($B_0 = -4.054929$),

B_1 is the logistic regression coefficient for the first covariate, bowel incontinence ($B_1 = 0.503225$),

$COVA$ is the resident-level score for the first covariate (0 or 1),

B_2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV ($B_2 = 2.200337$, and

$COVB$ is the resident-level score for the second covariate (0 or 1)

Step 4b: Calculate the expected resident score for each resident with the following formula:

[Equation 2] Resident-level expected QM score = $1 / [1 + e^{-x}]$

Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.

Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.

Step 6. Calculate the facility-level adjusted score based on the:

- facility-level observed QM score (step 2b),
- facility-level expected QM score (step 5), and
- national average observed QM score (step 3).

The calculation of the adjusted score uses the following equation:

[Equation 3] $Adj = 1 / [1 + e^{-y}]$

where

Adj is the facility-level adjusted QM score, and

$y = (\ln(Obs/(1-Obs)) - \ln(Exp/(1-Exp)) + \ln(Nat/(1-Nat)))$

Obs is the facility-level observed QM rate,

Exp is the facility-level expected QM rate,

Nat is the national observed QM rate ($Nat = 0.028926$), and

\ln indicates a natural logarithm.

e is the base of natural logarithms

RTI International. (2019). Analysis of Q3, 2018 MDS 3.0 data (programming reference: rn27_47\LC10_request_q2829_686.log)

Reference: The Centers for Medicare & Medicaid Services (CMS) (January 2019). MDS 3.0 Quality Measures User's Manual. RTI International, Waltham, MA. Accessed at:

<http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQQualityMeasures.html>; please see "MDS 3.0 QM User's Manual" in the "User's Manuals" zipped folder in the Downloads section at the bottom of the page.

Submission items

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

0281 : Urinary Tract Infection Admission Rate (PQI 12)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers' efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient's leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient

outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).

5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: N/A

5b.1 If competing, why superior or rationale for additive value: N/A – there are no competing measures for NQF #0686.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Steward

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Centers for Medicare & Medicaid Services

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Centers for Medicare & Medicaid Services

Description

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

Type

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Outcome

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Outcome

Data Source

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>.

Available at measure-specific web page URL identified in S.1 No data dictionary

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15.

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>

Available at measure-specific web page URL identified in S.1 No data dictionary

Level

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Facility

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Facility

Setting

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Post-Acute Care

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Post-Acute Care

Numerator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.

Numerator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments

(A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days (H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

Denominator Statement

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.

Denominator Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01, 02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

Exclusions

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.

Exclusion Details

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

A resident is excluded from the denominator if:

1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]).

2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS readmission/return anticipated assessment (A0310B = [06]), the resident is excluded.

A resident is also excluded if any of the following conditions are true:

1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]).

2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]).

3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

Risk Adjustment

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

No risk adjustment or risk stratification

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Statistical risk model

Stratification

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This is not applicable; this measure is not stratified.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This is not applicable; this measure is not stratified.

Type Score

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Rate/proportion better quality = lower score

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Rate/proportion better quality = lower score

Algorithm

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).

Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.

Step 3: Divide the results of step 2 by the results of step 1.

Step 4: Multiply the result of step 3 by 100 to obtain a percent value.

A description of the time period for the data included in this measure is provided in S.5 above.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows:

Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.

Step 2: Calculate the facility-level observed score (steps 2a through 2b below).

Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).

Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1

Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.

Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)

Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model.

Specifically, the covariates are calculated as follows:

For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):

1. Covariate = [1] if H0400 = [2, 3];
2. Covariate = [0] if H0400 = [0, 1, 9, -]

For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:

1. Covariate = [1] if any of the following are true:
 - a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9].
2. Covariate = [0] if the following is true:
 - a. M0300B1 = [0, -, ^] and
 - b. M0300C1 = [0, -, ^] and
 - c. M0300D1 = [0, -, ^].

*All covariates are missing if no prior assessment is available.

The logistic regression model is of the form:

$$[\text{Equation 1}] \text{ QM triggered (yes=1, no=0)} = B_0 + B_1 * \text{COVA} + B_2 * \text{COVB}$$

Where:

B0 is the logistic regression constant (B0 = -4.054929),

B1 is the logistic regression coefficient for the first covariate, bowel incontinence (B1 = 0.503225),

COVA is the resident-level score for the first covariate (0 or 1),

B2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV (B2 = 2.200337, and

COVB is the resident-level score for the second covariate (0 or 1)

Step 4b: Calculate the expected resident score for each resident with the following formula:

$$[\text{Equation 2}] \text{ Resident-level expected QM score} = 1 / [1 + e^{-x}]$$

Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.

Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.

Step 6. Calculate the facility-level adjusted score based on the:

- facility-level observed QM score (step 2b),
- facility-level expected QM score (step 5), and
- national average observed QM score (step 3).

The calculation of the adjusted score uses the following equation:

$$[\text{Equation 3}] \text{Adj} = 1 / [1 + e^{-y}]$$

where

Adj is the facility-level adjusted QM score, and

$$y = (\text{Ln}(\text{Obs}/(1-\text{Obs}) - \text{Ln}(\text{Exp}/(1-\text{Exp}) + \text{Ln}(\text{Nat}/(1-\text{Nat})))$$

Obs is the facility-level observed QM rate,

Exp is the facility-level expected QM rate,

Nat is the national observed QM rate (Nat = 0.028926), and

Ln indicates a natural logarithm.

e is the base of natural logarithms

RTI International. (2019). Analysis of Q3, 2018 MDS 3.0 data (programming reference: rn27_47\LC10_request_q2829_686.log)

Reference: The Centers for Medicare & Medicaid Services (CMS) (January 2019). MDS 3.0 Quality Measures User's Manual. RTI International, Waltham, MA. Accessed at:

[http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-](http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html)

[Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html](http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html); please see "MDS 3.0 QM User's Manual" in the "User's Manuals" zipped folder in the Downloads section at the bottom of the page.

Submission items

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

0281 : Urinary Tract Infection Admission Rate (PQI 12)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of

observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers' efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient's leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).

5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: N/A

5b.1 If competing, why superior or rationale for additive value: N/A – there are no competing measures for NQF #0686.

Comparison of NQF #0686 and NQF #0138

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Steward

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Centers for Medicare & Medicaid Services

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Centers for Disease Control and Prevention

Description

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) will be calculated among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU).

This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals.

Type

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Outcome

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Outcome

Data Source

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15.

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>

Available at measure-specific web page URL identified in S.1 No data dictionary

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Electronic Health Data, Electronic Health Records, Other, Paper Medical Records NHSN Urinary Tract Infection form; NHSN Denominators for Intensive Care Unit (ICU)/Other Locations (not NICU or SCA) form; NHSN Denominators for Specialty Care Areas/Oncology form.

Available at measure-specific web page URL identified in S.1 Attachment Copy_of_nhsn-data-dictionary.xlsx

Level

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Facility

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Facility, Other, Population : Regional and State

Setting

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Post-Acute Care

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Inpatient/Hospital, Other, Post-Acute Care Oncology hospital

Numerator Statement

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Total number of observed healthcare-associated CAUTI among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs).

*Numerator Details***0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)**

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days (H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

1. Definition of Infection that is Present on Admission (POA): An infection where all of the elements of an infection definition are present during the two calendar days before the day of admission, the first day of admission (day 1) and/or the day after admission (day 2) and are documented in the medical chart. Infections that are POA should not be reported as healthcare-associated infections (HAI) and are not reported as CAUTI. Symptoms must be documented in the chart by a healthcare professional during the POA time frame (e.g., nursing home documents fever prior to arrival to the hospital, patient reports fever >38.0°C). Physician diagnosis alone cannot be accepted as evidence of a urinary tract infection that is POA.

2. Definition of Healthcare-associated Infection (HAI): Any infection reported to NHSN must meet the definition of an NHSN HAI, that is, a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was not present on admission to the acute care facility. An infection is considered an HAI if the date of event of the NHSN site-specific infection criterion occurs on or after the 3rd calendar day of admission to an inpatient location where day of admission is calendar day 1. All elements of the site-specific infection criterion must occur during the infection window period.

3. Definition of Infection Window Period: The NHSN Infection Window Period is defined as the 7-days during which all site-specific infection criteria must be met. It includes the day the first positive diagnostic test that is an element of the site-specific infection criterion, was obtained, the 3 calendar days before and the 3 calendar days after.

4. Definition of CAUTI: A UTI (either a Symptomatic Urinary Tract Infection [SUTI], or an asymptomatic bacteremic urinary tract infection [ABUTI]) where an indwelling urinary catheter was in place for more than 2 consecutive days in an inpatient location 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 UTI date of event must be the day of discontinuation or the next calendar day to be catheter-associated.

5. Definition of indwelling 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 or suprapubic catheters unless a indwelling urinary catheter is also present. Indwelling urethral catheters that are used for intermittent or continuous irrigation are included in CAUTI surveillance.

6. NHSN UTI criteria: Symptomatic Urinary Tract Infection criteria or Asymptomatic Bacteremic Urinary Tract Infection criteria. See below:

A Symptomatic Urinary Tract Infection (SUTI) that is catheter associated must meet A) or B) below:

A) 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 as an inpatient on the date of event (day of device placement = Day 1) 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) (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 UTI criterion must occur during the Infection Window Period (See Definition Chapter 2 Identifying HAIs in NHSN).

† When entering event into NHSN choose “INPLACE” for Risk Factor for Urinary Catheter

‡ When entering event into NHSN choose “REMOVE” for Risk Factor for Urinary Catheter

*With no other recognized cause (see Comments)

^ These symptoms cannot be used when catheter is in place. An indwelling urinary catheter in place could cause patient complaints of “frequency” “urgency” or “dysuria”.

B) Patient must meet 1, 2, and 3 below:

1. Patient is ≥ 1 year of age

2. Patient has at least one of the following signs or symptoms:

- fever ($>38.0^\circ\text{C}$)
- hypothermia ($<36.0^\circ\text{C}$)
- apnea*
- bradycardia*
- lethargy*
- vomiting*
- suprapubic tenderness*

3. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml. All elements of the SUTI criterion must occur during the Infection Window Period

*With no other recognized cause

‡ If patient had an indwelling urinary catheter in place for more than 2 consecutive days in an inpatient location, and catheter was in place on the date of event or the previous day the CAUTI criterion is met. If no such indwelling urinary catheter was in place, UTI (non-catheter associated) criterion is met.

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.

An Asymptomatic Bacteremic Urinary Tract Infection (ABUTI) that is catheter associated must meet the following:

Patient must meet 1, 2, and 3 below:

1. Patient has no signs or symptoms of SUTI 1 or 2 according to age

2. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml

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).

** 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)).

7. Definition of Location of Attribution: The inpatient location where the patient was assigned on the date of the UTI event.

8. Definition of Date of Event: The date when the first element used to meet the UTI criterion occurred during the infection window period.

9. Definition of Repeat Infection Timeframe (RIT): The RIT is a 14-day timeframe during which no new infections of the same type are reported. The date of event is Day 1 of the 14-day RIT. Additional pathogens recovered during the RIT from the same type of infection are added to the event. The RIT will apply at the level of specific type of infection with the exception of BSI, UTI, and PNEU where the RIT will apply at the major type of infection.

Denominator Statement

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline Data is calculated using the facility's number of catheter days and the following significant risk factors:

- Acute Care Hospitals: CDC Location, Facility bed size, Medical school affiliation, and Facility type
- Critical Access Hospitals: Medical school affiliation
- Long-Term Acute Hospitals: Average length of stay, Setting type, and Location type
- Inpatient Rehabilitation Facilities: Setting type, Proportion of admissions with traumatic and non-traumatic spinal cord dysfunction, Proportion of admissions with stroke

Denominator Details

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their

cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01, 02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Numbers of indwelling urinary catheter days attributed to each location are counted for each data period using the following definitions and guidelines. All indwelling urinary catheter days for each location and data period are summed.

1. Definition of indwelling catheter day: For each patient, a day that an indwelling urinary catheter was present at the time of the indwelling urinary catheter day count.
2. CDC Location (acute care hospitals, long term acute care hospitals): Each patient care area in a facility that is monitored in NHSN is “mapped” to one or more CDC Locations. The specific CDC Location code is determined by the type of patients cared for in that area according to the 80% Rule. That is, if 80% of patients are of a certain type (e.g., pediatric patients with orthopedic problems) then that area is designated as that type of location (in this case, an Inpatient Pediatric Orthopedic Ward).
https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf
3. Medical school affiliation categories:
 - a. Major – facility has a program for medical students and post-graduate medical training
 - b. Graduate – facility has a program for post-graduate medical training (i.e., residency and/or fellowships)
 - c. Undergraduate: facility has a program for medical students only
4. Facility bedsize: Number of beds set up and staffed in the healthcare facility
5. Setting (Freestanding or Within a Hospital): Describes physical placement of LTACH or IRF and does not define financial or administrative relationship with other healthcare facility types.
6. Definition for Facility Physician Education Status: Teaching statuses: major, graduate, undergraduate - Major: Facility has a program for medical students and post-graduate medical training; Graduate: Facility has a program for post-graduate medical training (i.e., residency and/or fellowships); Undergraduate: Facility has a program for medical students only.
7. Proportion of admissions within a diagnostic category: number of admissions during the calendar year where the primary diagnosis of that type (e.g. traumatic spinal cord dysfunction) divided by the total number of admissions during the calendar year

Exclusions

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status

is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

The following are not considered indwelling catheters by NHSN definitions:

1. Suprapubic catheters
2. Condom catheters
3. “In and out” catheterizations
4. Nephrostomy tubes

Note, that if a patient has either a nephrostomy tube or a suprapubic catheter and also has an indwelling urinary catheter, the indwelling urinary catheter will be included in the CAUTI surveillance.

Exclusion Details

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS readmission/return anticipated assessment (A0310B = [06]), the resident is excluded.

A resident is also excluded if any of the following conditions are true:

- 1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]).
- 2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]).
- 3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

See S. 10

Risk Adjustment

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Statistical risk model

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Statistical risk model

Stratification

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This is not applicable; this measure is not stratified.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

CAUTI data is stratified by facility-specific and individual patient location data (i.e., bedsize of location, affiliation and level of affiliation with a medical school [Teaching statuses: major, graduate, undergraduate, not affiliated - See definitions S.7. above.

Type Score

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Rate/proportion better quality = lower score

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Ratio better quality = lower score

Algorithm

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows:

Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.

Step 2: Calculate the facility-level observed score (steps 2a through 2b below).

Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).

Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1

Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.

Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)

Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model.

Specifically, the covariates are calculated as follows:

For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):

1. Covariate = [1] if H0400 = [2, 3];
2. Covariate = [0] if H0400 = [0, 1, 9, -]

For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:

1. Covariate = [1] if any of the following are true:
 - a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9].
2. Covariate = [0] if the following is true:
 - a. M0300B1 = [0, -, ^] and
 - b. M0300C1 = [0, -, ^] and
 - c. M0300D1 = [0, -, ^].

*All covariates are missing if no prior assessment is available.

The logistic regression model is of the form:

$$[\text{Equation 1}] \text{ QM triggered (yes=1, no=0)} = B_0 + B_1 \cdot \text{COVA} + B_2 \cdot \text{COVB}$$

Where:

B0 is the logistic regression constant (B0 = -4.054929),

B1 is the logistic regression coefficient for the first covariate, bowel incontinence (B1 = 0.503225),

COVA is the resident-level score for the first covariate (0 or 1),

B2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV (B2 = 2.200337, and

COVB is the resident-level score for the second covariate (0 or 1)

Step 4b: Calculate the expected resident score for each resident with the following formula:

$$[\text{Equation 2}] \text{ Resident-level expected QM score} = 1 / [1 + e^{-x}]$$

Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.

Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.

Step 6. Calculate the facility-level adjusted score based on the:

- facility-level observed QM score (step 2b),
- facility-level expected QM score (step 5), and

- national average observed QM score (step 3).

The calculation of the adjusted score uses the following equation:

$$[\text{Equation 3}] \text{Adj} = 1 / [1 + e^{-y}]$$

where

Adj is the facility-level adjusted QM score, and

$$y = (\text{Ln}(\text{Obs}/(1-\text{Obs}) - \text{Ln}(\text{Exp}/(1-\text{Exp}) + \text{Ln}(\text{Nat}/(1-\text{Nat})))$$

Obs is the facility-level observed QM rate,

Exp is the facility-level expected QM rate,

Nat is the national observed QM rate (Nat = 0.028926), and

Ln indicates a natural logarithm.

e is the base of natural logarithms

RTI International. (2019). Analysis of Q3, 2018 MDS 3.0 data (programming reference: rn27_47\LC10_request_q2829_686.log)

Reference: The Centers for Medicare & Medicaid Services (CMS) (January 2019). MDS 3.0 Quality Measures User's Manual. RTI International, Waltham, MA. Accessed at:

<http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html>; please see "MDS 3.0 QM User's Manual" in the "User's Manuals" zipped folder in the Downloads section at the bottom of the page.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

The Standardized Infection Ratio (SIR) for annual and quarterly data aggregation and analysis of CAUTI events is calculated for each healthcare facility for a specified time period. The SIR is an indirect standardization method for summarizing healthcare associated infection (HAI) experience, including CAUTI events, in a single group of data or across any number of stratified groups of data. To produce the SIR:

1. Identify number of observed healthcare-associated CAUTIs for a given time period by adding the total number of observed CAUTIs across the facility.
2. Calculate the number of predicted healthcare-associated CAUTIs for each CDC location using a negative binomial regression model and the risk factors described above.
3. Calculate the number of predicted healthcare-associated CAUTIs for the facility and time period by adding the predicted number of CAUTIs for each location across the facility.
4. Divide the number of observed healthcare-associated CAUTIs (1 above) by the number of predicted healthcare-associated CAUTIs (3 above) to obtain the SIR.

5. Perform a Poisson test to compare the SIR obtained in 4 above to the nominal value of 1. P-value and confidence interval will be calculated, which can be used to assess significance of SIR.

(The NHSN analysis tool will perform the calculations once the patient infection data, denominator information, and related facility-level information are entered into the system.)

The Adjusted Ranking Metric (ARM) for annual data aggregation and analysis of HAI events, including CAUTI events, combines the method of indirect standardization used to calculate the unadjusted SIR described above with a Bayesian random effects hierarchical model to account for the potentially low precision and/or reliability inherent in the unadjusted SIR. A Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling is used to produce the adjusted numerator. The ARM enables more meaningful statistical differentiation between hospitals by accounting for differences in patient case-mix, exposure volume (e.g. patient days, indwelling urinary catheter days, central line-days, surgical procedure volume), and unmeasured factors that are not reflected in the unadjusted SIR and that cause variation between healthcare facilities. Accounting for these sources of variability enables better measure discrimination between facilities and leads to more reliable performance rankings. To produce the ARM:

1. Identify the number of CAUTI in each location
2. Obtain the adjusted number of observed CAUTIs by using a Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling which results from a Bayesian random effects model.
3. Total these numbers for an observed number of CAUTIs
4. Obtain the predicted number of CAUTIs in the same locations by multiplying the observed indwelling urinary catheter days according to the factors significantly associated with predicting CAUTI incidence as identified through a Log-linear Negative Binomial Regression Model.
5. Divide the total number of adjusted CAUTI events (“3” above) by the predicted number of CAUTIs (“4” above).
6. Result = ARM

Submission items

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: N/A

5b.1 If competing, why superior or rationale for additive value: N/A – there are no competing measures for NQF #0686.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value:

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Steward

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Centers for Medicare & Medicaid Services

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Centers for Disease Control and Prevention

Description

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) will be calculated among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU).

This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals.

Type

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Outcome

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Outcome

Data Source

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15.

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>

Available at measure-specific web page URL identified in S.1 No data dictionary

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Electronic Health Data, Electronic Health Records, Other, Paper Medical Records NHSN Urinary Tract Infection form; NHSN Denominators for Intensive Care Unit (ICU)/Other Locations (not NICU or SCA) form; NHSN Denominators for Specialty Care Areas/Oncology form.

Available at measure-specific web page URL identified in S.1 Attachment Copy_of_nhsn-data-dictionary.xlsx

Level

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Facility

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Facility, Other, Population : Regional and State

Setting

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Post-Acute Care

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Inpatient/Hospital, Other, Post-Acute Care Oncology hospital

Numerator Statement

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Total number of observed healthcare-associated CAUTI among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs).

Numerator Details

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days (H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

1. Definition of Infection that is Present on Admission (POA): An infection where all of the elements of an infection definition are present during the two calendar days before the day of admission, the first day of admission (day 1) and/or the day after admission (day 2) and are documented in the medical chart. Infections that are POA should not be reported as healthcare-associated infections (HAI) and are not reported as CAUTI. Symptoms must be documented in the chart by a healthcare professional during

the POA time frame (e.g., nursing home documents fever prior to arrival to the hospital, patient reports fever >38.0°C). Physician diagnosis alone cannot be accepted as evidence of a urinary tract infection that is POA.

2. Definition of Healthcare-associated Infection (HAI): Any infection reported to NHSN must meet the definition of an NHSN HAI, that is, a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was not present on admission to the acute care facility. An infection is considered an HAI if the date of event of the NHSN site-specific infection criterion occurs on or after the 3rd calendar day of admission to an inpatient location where day of admission is calendar day 1. All elements of the site-specific infection criterion must occur during the infection window period.

3. Definition of Infection Window Period: The NHSN Infection Window Period is defined as the 7-days during which all site-specific infection criteria must be met. It includes the day the first positive diagnostic test that is an element of the site-specific infection criterion, was obtained, the 3 calendar days before and the 3 calendar days after.

4. Definition of CAUTI: A UTI (either a Symptomatic Urinary Tract Infection [SUTI], or an asymptomatic bacteremic urinary tract infection [ABUTI]) where an indwelling urinary catheter was in place for more than 2 consecutive days in an inpatient location 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 UTI date of event must be the day of discontinuation or the next calendar day to be catheter-associated.

5. Definition of indwelling 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 or suprapubic catheters unless a indwelling urinary catheter is also present. Indwelling urethral catheters that are used for intermittent or continuous irrigation are included in CAUTI surveillance.

6. NHSN UTI criteria: Symptomatic Urinary Tract Infection criteria or Asymptomatic Bacteremic Urinary Tract Infection criteria. See below:

A Symptomatic Urinary Tract Infection (SUTI) that is catheter associated must meet A) or B) below:

A) 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 as an inpatient on the date of event (day of device placement = Day 1) 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) (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 UTI criterion must occur during the Infection Window Period (See Definition Chapter 2 Identifying HAIs in NHSN).

† When entering event into NHSN choose “INPLACE” for Risk Factor for Urinary Catheter

‡ When entering event into NHSN choose “REMOVE” for Risk Factor for Urinary Catheter

*With no other recognized cause (see Comments)

^ These symptoms cannot be used when catheter is in place. An indwelling urinary catheter in place could cause patient complaints of “frequency” “urgency” or “dysuria”.

B) Patient must meet 1, 2, and 3 below:

1. Patient is ≥ 1 year of age
2. Patient has at least one of the following signs or symptoms:
 - fever ($>38.0^\circ\text{C}$)
 - hypothermia ($<36.0^\circ\text{C}$)
 - apnea*
 - bradycardia*
 - lethargy*
 - vomiting*
 - suprapubic tenderness*

3. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml. All elements of the SUTI criterion must occur during the Infection Window Period

*With no other recognized cause

‡ If patient had an indwelling urinary catheter in place for more than 2 consecutive days in an inpatient location, and catheter was in place on the date of event or the previous day the CAUTI criterion is met. If no such indwelling urinary catheter was in place, UTI (non-catheter associated) criterion is met.

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.

An Asymptomatic Bacteremic Urinary Tract Infection (ABUTI) that is catheter associated must meet the following:

Patient must meet 1, 2, and 3 below:

1. Patient has no signs or symptoms of SUTI 1 or 2 according to age
2. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of $\geq 10^5$ CFU/ml
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).

** 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)).

7. Definition of Location of Attribution: The inpatient location where the patient was assigned on the date of the UTI event.
8. Definition of Date of Event: The date when the first element used to meet the UTI criterion occurred during the infection window period.
9. Definition of Repeat Infection Timeframe (RIT): The RIT is a 14-day timeframe during which no new infections of the same type are reported. The date of event is Day 1 of the 14-day RIT. Additional pathogens recovered during the RIT from the same type of infection are added to the event. The RIT will apply at the level of specific type of infection with the exception of BSI, UTI, and PNEU where the RIT will apply at the major type of infection.

Denominator Statement

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline Data is calculated using the facility's number of catheter days and the following significant risk factors:

- Acute Care Hospitals: CDC Location, Facility bed size, Medical school affiliation, and Facility type
- Critical Access Hospitals: Medical school affiliation
- Long-Term Acute Hospitals: Average length of stay, Setting type, and Location type
- Inpatient Rehabilitation Facilities: Setting type, Proportion of admissions with traumatic and non-traumatic spinal cord dysfunction, Proportion of admissions with stroke

*Denominator Details***0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)**

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01, 02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Numbers of indwelling urinary catheter days attributed to each location are counted for each data period using the following definitions and guidelines. All indwelling urinary catheter days for each location and data period are summed.

1. Definition of indwelling catheter day: For each patient, a day that an indwelling urinary catheter was present at the time of the indwelling urinary catheter day count.
2. CDC Location (acute care hospitals, long term acute care hospitals): Each patient care area in a facility that is monitored in NHSN is “mapped” to one or more CDC Locations. The specific CDC Location code is determined by the type of patients cared for in that area according to the 80% Rule. That is, if 80% of patients are of a certain type (e.g., pediatric patients with orthopedic problems) then that area is designated as that type of location (in this case, an Inpatient Pediatric Orthopedic Ward).
https://www.cdc.gov/nhsn/pdfs/pscmanual/15locationsdescriptions_current.pdf
3. Medical school affiliation categories:
 - a. Major – facility has a program for medical students and post-graduate medical training
 - b. Graduate – facility has a program for post-graduate medical training (i.e., residency and/or fellowships)
 - c. Undergraduate: facility has a program for medical students only
4. Facility bedsize: Number of beds set up and staffed in the healthcare facility
5. Setting (Freestanding or Within a Hospital): Describes physical placement of LTACH or IRF and does not define financial or administrative relationship with other healthcare facility types.
6. Definition for Facility Physician Education Status: Teaching statuses: major, graduate, undergraduate - Major: Facility has a program for medical students and post-graduate medical training; Graduate: Facility has a program for post-graduate medical training (i.e., residency and/or fellowships); Undergraduate: Facility has a program for medical students only.
7. Proportion of admissions within a diagnostic category: number of admissions during the calendar year where the primary diagnosis of that type (e.g. traumatic spinal cord dysfunction) divided by the total number of admissions during the calendar year

Exclusions

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

The following are not considered indwelling catheters by NHSN definitions:

1. Suprapubic catheters
2. Condom catheters
3. "In and out" catheterizations
4. Nephrostomy tubes

Note, that if a patient has either a nephrostomy tube or a suprapubic catheter and also has an indwelling urinary catheter, the indwelling urinary catheter will be included in the CAUTI surveillance.

Exclusion Details

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS readmission/return anticipated assessment (A0310B = [06]), the resident is excluded.

A resident is also excluded if any of the following conditions are true:

- 1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]).
- 2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]).
- 3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

See S. 10

Risk Adjustment

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Statistical risk model

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Statistical risk model

Stratification

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This is not applicable; this measure is not stratified.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

CAUTI data is stratified by facility-specific and individual patient location data (i.e., bedsize of location, affiliation and level of affiliation with a medical school [Teaching statuses: major, graduate, undergraduate, not affiliated - See definitions S.7. above.

Type Score

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Rate/proportion better quality = lower score

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

Ratio better quality = lower score

Algorithm

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows:

Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.

Step 2: Calculate the facility-level observed score (steps 2a through 2b below).

Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).

Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1

Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.

Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)

Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model.

Specifically, the covariates are calculated as follows:

For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):

1. Covariate = [1] if H0400 = [2, 3];
2. Covariate = [0] if H0400 = [0, 1, 9, -]

For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:

1. Covariate = [1] if any of the following are true:
 - a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9].
2. Covariate = [0] if the following is true:
 - a. M0300B1 = [0, -, ^] and
 - b. M0300C1 = [0, -, ^] and
 - c. M0300D1 = [0, -, ^].

*All covariates are missing if no prior assessment is available.

The logistic regression model is of the form:

$$[\text{Equation 1}] \text{ QM triggered (yes=1, no=0)} = B_0 + B_1 * \text{COVA} + B_2 * \text{COVB}$$

Where:

B0 is the logistic regression constant (B0 = -4.054929),

B1 is the logistic regression coefficient for the first covariate, bowel incontinence (B1 = 0.503225),

COVA is the resident-level score for the first covariate (0 or 1),

B2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV (B2 = 2.200337, and

COVB is the resident-level score for the second covariate (0 or 1)

Step 4b: Calculate the expected resident score for each resident with the following formula:

$$[\text{Equation 2}] \text{ Resident-level expected QM score} = 1 / [1 + e^{-x}]$$

Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.

Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.

Step 6. Calculate the facility-level adjusted score based on the:

- facility-level observed QM score (step 2b),
- facility-level expected QM score (step 5), and
- national average observed QM score (step 3).

The calculation of the adjusted score uses the following equation:

$$[\text{Equation 3}] \text{Adj} = 1 / [1 + e^{-y}]$$

where

Adj is the facility-level adjusted QM score, and

$$y = (\text{Ln}(\text{Obs}/(1-\text{Obs}) - \text{Ln}(\text{Exp}/(1-\text{Exp}) + \text{Ln}(\text{Nat}/(1-\text{Nat})))$$

Obs is the facility-level observed QM rate,

Exp is the facility-level expected QM rate,

Nat is the national observed QM rate (Nat = 0.028926), and

Ln indicates a natural logarithm.

e is the base of natural logarithms

RTI International. (2019). Analysis of Q3, 2018 MDS 3.0 data (programming reference: rn27_47\LC10_request_q2829_686.log)

Reference: The Centers for Medicare & Medicaid Services (CMS) (January 2019). MDS 3.0 Quality Measures User's Manual. RTI International, Waltham, MA. Accessed at:

<http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html>; please see "MDS 3.0 QM User's Manual" in the "User's Manuals" zipped folder in the Downloads section at the bottom of the page.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

The Standardized Infection Ratio (SIR) for annual and quarterly data aggregation and analysis of CAUTI events is calculated for each healthcare facility for a specified time period. The SIR is an indirect standardization method for summarizing healthcare associated infection (HAI) experience, including CAUTI events, in a single group of data or across any number of stratified groups of data. To produce the SIR:

1. Identify number of observed healthcare-associated CAUTIs for a given time period by adding the total number of observed CAUTIs across the facility.
2. Calculate the number of predicted healthcare-associated CAUTIs for each CDC location using a negative binomial regression model and the risk factors described above.
3. Calculate the number of predicted healthcare-associated CAUTIs for the facility and time period by adding the predicted number of CAUTIs for each location across the facility.
4. Divide the number of observed healthcare-associated CAUTIs (1 above) by the number of predicted healthcare-associated CAUTIs (3 above) to obtain the SIR.
5. Perform a Poisson test to compare the SIR obtained in 4 above to the nominal value of 1. P-value and confidence interval will be calculated, which can be used to assess significance of SIR.

(The NHSN analysis tool will perform the calculations once the patient infection data, denominator information, and related facility-level information are entered into the system.)

The Adjusted Ranking Metric (ARM) for annual data aggregation and analysis of HAI events, including CAUTI events, combines the method of indirect standardization used to calculate the unadjusted SIR described above with a Bayesian random effects hierarchical model to account for the potentially low precision and/or reliability inherent in the unadjusted SIR. A Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling is used to produce the adjusted numerator. The ARM enables more meaningful statistical differentiation between hospitals by accounting for differences in patient case-mix, exposure volume (e.g. patient days, indwelling urinary catheter days, central line-days, surgical procedure volume), and unmeasured factors that are not reflected in the unadjusted SIR and that cause variation between healthcare facilities. Accounting for these sources of variability enables better measure discrimination between facilities and leads to more reliable performance rankings. To produce the ARM:

1. Identify the number of CAUTI in each location
2. Obtain the adjusted number of observed CAUTIs by using a Bayesian posterior distribution constructed through Monte Carlo Markov Chain sampling which results from a Bayesian random effects model.
3. Total these numbers for an observed number of CAUTIs
4. Obtain the predicted number of CAUTIs in the same locations by multiplying the observed indwelling urinary catheter days according to the factors significantly associated with predicting CAUTI incidence as identified through a Log-linear Negative Binomial Regression Model.
5. Divide the total number of adjusted CAUTI events (“3” above) by the predicted number of CAUTIs (“4” above).
6. Result = ARM

Submission items

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: N/A

5b.1 If competing, why superior or rationale for additive value: N/A – there are no competing measures for NQF #0686.

0138: National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact:

5b.1 If competing, why superior or rationale for additive value:

Comparison of NQF #0686 and NQF #0684

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Steward

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Centers for Medicare & Medicaid Services

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Centers for Medicare & Medicaid Services

Description

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

Type

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Outcome

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Outcome

Data Source

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15.

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>

Available at measure-specific web page URL identified in S.1 No data dictionary

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>.

Available at measure-specific web page URL identified in S.1 No data dictionary

Level

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Facility

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Facility

Setting

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Post-Acute Care

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Post-Acute Care

Numerator Statement

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.

Numerator Details

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days (H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

Denominator Statement

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.

Denominator Details

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01, 02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06])); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

Exclusions

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.

Exclusion Details

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS

readmission/return anticipated assessment (A0310B = [06]), the resident is excluded.

A resident is also excluded if any of the following conditions are true:

- 1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]).
- 2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]).
- 3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

A resident is excluded from the denominator if:

1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]).
2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

Risk Adjustment

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Statistical risk model

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

No risk adjustment or risk stratification

Stratification

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This is not applicable; this measure is not stratified.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This is not applicable; this measure is not stratified.

Type Score

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Rate/proportion better quality = lower score

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Rate/proportion better quality = lower score

Algorithm

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows:

Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.

Step 2: Calculate the facility-level observed score (steps 2a through 2b below).

Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).

Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1

Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.

Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)

Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model.

Specifically, the covariates are calculated as follows:

For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):

1. Covariate = [1] if H0400 = [2, 3];
2. Covariate = [0] if H0400 = [0, 1, 9, -]

For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:

1. Covariate = [1] if any of the following are true:
 - a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9].

2. Covariate = [0] if the following is true:

- a. M0300B1 = [0, -, ^] and
- b. M0300C1 = [0, -, ^] and
- c. M0300D1 = [0, -, ^].

*All covariates are missing if no prior assessment is available.

The logistic regression model is of the form:

[Equation 1] QM triggered (yes=1, no=0) = $B_0 + B_1 \cdot COVA + B_2 \cdot COVB$

Where:

B_0 is the logistic regression constant ($B_0 = -4.054929$),

B_1 is the logistic regression coefficient for the first covariate, bowel incontinence ($B_1 = 0.503225$),

COVA is the resident-level score for the first covariate (0 or 1),

B_2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV ($B_2 = 2.200337$, and

COVB is the resident-level score for the second covariate (0 or 1)

Step 4b: Calculate the expected resident score for each resident with the following formula:

[Equation 2] Resident-level expected QM score = $1 / [1 + e^{-x}]$

Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.

Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.

Step 6. Calculate the facility-level adjusted score based on the:

- facility-level observed QM score (step 2b),
- facility-level expected QM score (step 5), and
- national average observed QM score (step 3).

The calculation of the adjusted score uses the following equation:

[Equation 3] Adj = $1 / [1 + e^{-y}]$

where

Adj is the facility-level adjusted QM score, and

$y = (\ln(\text{Obs}/(1-\text{Obs})) - \ln(\text{Exp}/(1-\text{Exp})) + \ln(\text{Nat}/(1-\text{Nat})))$

Obs is the facility-level observed QM rate,

Exp is the facility-level expected QM rate,
Nat is the national observed QM rate (Nat = 0.028926), and
Ln indicates a natural logarithm.
e is the base of natural logarithms

RTI International. (2019). Analysis of Q3, 2018 MDS 3.0 data (programming reference: rn27_47\LC10_request_q2829_686.log)
Reference: The Centers for Medicare & Medicaid Services (CMS) (January 2019). MDS 3.0 Quality Measures User's Manual. RTI International, Waltham, MA. Accessed at:
<http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html>; please see "MDS 3.0 QM User's Manual" in the "User's Manuals" zipped folder in the Downloads section at the bottom of the page.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).
Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.
Step 3: Divide the results of step 2 by the results of step 1.
Step 4: Multiply the result of step 3 by 100 to obtain a percent value.
A description of the time period for the data included in this measure is provided in S.5 above.

Submission items

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

5.1 Identified measures:
5a.1 Are specs completely harmonized? No
5a.2 If not completely harmonized, identify difference, rationale, impact: N/A
5b.1 If competing, why superior or rationale for additive value: N/A – there are no competing measures for NQF #0686.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure
0281 : Urinary Tract Infection Admission Rate (PQI 12)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers' efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient's leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).

5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Steward

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Centers for Medicare & Medicaid Services

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Centers for Medicare & Medicaid Services

Description

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure reports the percentage of low risk, long-stay residents who have had an indwelling catheter in the last seven days prior to the assessment reference date on the target assessment. In this case, low-risk refers to residents who do not have preexisting conditions, such as neurogenic bladder or obstructive uropathy, which predispose catheter use. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This measure reports the percentage of long-stay residents in a nursing home who have a urinary tract infection in the 30 days prior to the target assessment. This measure is based on data from the Minimum Data Set (MDS) 3.0 OBRA, PPS, and/or discharge assessments during the selected quarter. Long-stay nursing home residents are identified as those who have had 101 or more cumulative days of nursing home care.

Type

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Outcome

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Outcome

Data Source

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI) version 1.15.

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>

Available at measure-specific web page URL identified in S.1 No data dictionary

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Assessment Data The data source is the Minimum Data Set (MDS) 3.0, and the collection instrument is the Resident Assessment Instrument (RAI).

For MDS 3.0 item sets used to calculate the quality measure, refer to: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIMDS30TechnicalInformation.html>.

Available at measure-specific web page URL identified in S.1 No data dictionary

Level

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Facility

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Facility

Setting

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Post-Acute Care

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Post-Acute Care

Numerator Statement

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates a urinary tract infection within the last 30 days.

*Numerator Details***0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)**

The numerator is the number of long-stay nursing home residents in the denominator sample with an episode during the selected quarter with a target assessment that indicates the use of indwelling catheters within the last seven days (H0100A = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The numerator is the number of long-stay residents in the denominator sample with a selected target assessment that indicates urinary tract infection within the last 30 days (I2300 = [1]). For every calendar quarter (3-month period), the Centers for Medicare & Medicaid Services (CMS) select episodes for long-stay residents during that quarter from each nursing home and use the target assessment from that episode to calculate the measure. For any resident with multiple episodes of care during the quarter, only the latest episode will be counted. A target assessment is defined as the latest assessment that meets the following criteria: (a) it is contained within the resident's selected episode, (b) it has a qualifying reason for assessment, and (c) its target date is no more than 120 days before the end of the episode.

Residents are counted in the numerator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero.

The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments

(A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11]), except those with exclusions (specified in S.8 and S.9).

An episode is defined as a period of time spanning one or more stays. An episode begins with an admission and ends with either (a) a discharge, or (b) the end of the target period, whichever comes first. Data are publicly reported on the Nursing Home Compare website and are weighted on an average of four target periods.

Denominator Statement

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS, or discharge assessment) and who do not meet the exclusion criteria.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

The denominator includes all long-stay residents in the nursing home who have an episode during the selected quarter with a qualifying target assessment (OBRA, PPS or discharge) and who do not meet the exclusion criteria.

Denominator Details

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home after a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment during the selected quarter (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = 01, 02, 03, 04, 05, 06); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = 01, 02, 03, 04, 05); or discharge assessment with or without anticipated return (A0310F = 10, 11)), except for those who meet the exclusion criteria (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Residents are counted in the denominator if they are long-stay residents, defined as residents who have had 101 or more cumulative days of nursing home care. Residents who return to the nursing home following a hospital discharge will not have their cumulative days in facility reset to zero. The target population includes all long-stay residents with a target assessment (assessments may be an OBRA admission, quarterly, annual or significant change/correction assessment (A0310A = [01, 02, 03, 04, 05, 06]); or PPS 5-, 14-, 30-, 60-, 90-day assessments (A0310B = [01, 02, 03, 04, 05]); or discharge assessment with or without anticipated return (A0310F = [10, 11])), except those with exclusions (specified in S.8 and S.9).

A description of the time period for the data included in this measure is provided in S.5 above.

Exclusions

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

The denominator exclusion criteria for this quality measure are as follows: 1) The target assessment is an admission assessment, a PPS 5-day assessment or a PPS readmission/return assessment; 2) The target assessment indicates that indwelling catheter status is missing; 3) The target assessment indicates neurogenic bladder or neurogenic bladder status is missing; or 4) The target assessment indicates obstructive uropathy or obstructive uropathy status is missing.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

If the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, the resident is excluded from the denominator for this quality measure. A resident is also excluded if the target assessment indicates that data is missing for the data element assessing urinary tract infection in the last 30 days.

Exclusion Details

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

If the target assessment is an admission assessment (A0310A = [01]), PPS 5-day assessment (A0310B = [01]) or PPS readmission/return anticipated assessment (A0310B = [06]), the resident is excluded.

A resident is also excluded if any of the following conditions are true:

- 1) Target assessment indicates that indwelling catheter status is missing (H0100A = [-]).
- 2) Target assessment indicates neurogenic bladder (I1550 = [1]) or neurogenic bladder status is missing (I1550 = [-]).
- 3) Target assessment indicates obstructive uropathy (I1650 = [1]) or obstructive uropathy status is missing (I1650 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

A resident is excluded from the denominator if:

1. The target assessment is an OBRA Admission Assessment (A0310A = [01]) or a PPS 5-Day Assessment (A0310B = [01]) or a PPS Readmission/Return Assessment (A0310B = [06]).
2. The target assessment indicates that the value for the data element regarding urinary tract infection in the last 30 days is missing (I2300 = [-]).

If the facility sample includes fewer than 20 residents after all other resident-level exclusions are applied, then the facility is suppressed from public reporting because of small sample size.

Risk Adjustment

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Statistical risk model

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

No risk adjustment or risk stratification

Stratification

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This is not applicable; this measure is not stratified.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

This is not applicable; this measure is not stratified.

Type Score

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

Rate/proportion better quality = lower score

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Rate/proportion better quality = lower score

Algorithm

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

This measure is risk-adjusted for bowel incontinence and pressure ulcers at Stage II, III, or IV using a logistic regression. The measure is calculated as follows:

Step 1: Identify the total number of long-stay residents who do not meet the exclusion criteria, with a selected target assessment (OBRA, PPS, or discharge) during the quarter.

Step 2: Calculate the facility-level observed score (steps 2a through 2b below).

Step 2a: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment that meets the numerator inclusion criteria (H0100A = [1]).

Step 2b: Calculate the facility observed score by dividing the results of step 2a by the results of step 1

Step 3: Calculate the national observed score by averaging the scores derived in step 2b across all facilities.

Step 4: Calculate the expected resident score for each resident (steps 4a and 4b below)

Step 4a: Assign covariate values, either '0' for covariate condition not present or '1' for covariate condition present, for the residents included in the denominator for each of the two covariates (bowel incontinence and presence of pressure ulcers) based on the resident's prior assessment and run the logistic regression model.

Specifically, the covariates are calculated as follows:

For the variable identifying frequent bowel incontinence on prior assessment (H0400 = [2, 3]):

1. Covariate = [1] if H0400 = [2, 3];
2. Covariate = [0] if H0400 = [0, 1, 9, -]

For the variable identifying pressure ulcers at stage II, III, or IV on prior assessment:

1. Covariate = [1] if any of the following are true:
 - a. M0300B1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - b. M0300C1 = [1, 2, 3, 4, 5, 6, 7, 8, 9], or
 - c. M0300D1 = [1, 2, 3, 4, 5, 6, 7, 8, 9].
2. Covariate = [0] if the following is true:
 - a. M0300B1 = [0, -, ^] and
 - b. M0300C1 = [0, -, ^] and
 - c. M0300D1 = [0, -, ^].

*All covariates are missing if no prior assessment is available.

The logistic regression model is of the form:

$$[\text{Equation 1}] \text{ QM triggered (yes=1, no=0)} = B_0 + B_1 * \text{COVA} + B_2 * \text{COVB}$$

Where:

B0 is the logistic regression constant (B0 = -4.054929),

B1 is the logistic regression coefficient for the first covariate, bowel incontinence (B1 = 0.503225),

COVA is the resident-level score for the first covariate (0 or 1),

B2 is the logistic regression coefficient for the second covariate, pressure ulcers at stage II, III, or IV (B2 = 2.200337, and

COVB is the resident-level score for the second covariate (0 or 1)

Step 4b: Calculate the expected resident score for each resident with the following formula:

$$[\text{Equation 2}] \text{ Resident-level expected QM score} = 1 / [1 + e^{-x}]$$

Where e is the base of natural logarithms and x is a linear combination of the constant and the logistic regression coefficients times the covariate scores (from Equation [1], above). A covariate score will be 1 if the covariate is triggered for that resident, and 0 if the covariate is not triggered.

Step 5: Calculate the facility-level expected QM score by averaging all resident-level expected scores derived in step 4b.

Step 6. Calculate the facility-level adjusted score based on the:

- facility-level observed QM score (step 2b),
- facility-level expected QM score (step 5), and
- national average observed QM score (step 3).

The calculation of the adjusted score uses the following equation:

$$[\text{Equation 3}] \text{Adj} = 1 / [1 + e^{-y}]$$

where

Adj is the facility-level adjusted QM score, and

$$y = (\text{Ln}(\text{Obs}/(1-\text{Obs}) - \text{Ln}(\text{Exp}/(1-\text{Exp}) + \text{Ln}(\text{Nat}/(1-\text{Nat})))$$

Obs is the facility-level observed QM rate,

Exp is the facility-level expected QM rate,

Nat is the national observed QM rate (Nat = 0.028926), and

Ln indicates a natural logarithm.

e is the base of natural logarithms

RTI International. (2019). Analysis of Q3, 2018 MDS 3.0 data (programming reference: rn27_47\LC10_request_q2829_686.log)

Reference: The Centers for Medicare & Medicaid Services (CMS) (January 2019). MDS 3.0 Quality Measures User's Manual. RTI International, Waltham, MA. Accessed at:

<http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/NHQIQualityMeasures.html>; please see "MDS 3.0 QM User's Manual" in the "User's Manuals" zipped folder in the Downloads section at the bottom of the page.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

Step 1: Identify the total number of long-stay residents with an episode during the quarter selected with a qualifying target assessment (OBRA, PPS, or discharge) and who do not meet the exclusion criteria (i.e., if the target assessment is an OBRA Admission Assessment, PPS 5-Day Assessment, or PPS Readmission/Return Assessment, or if I2300 = [-] on the target assessment).

Step 2: Starting with the set of residents identified in Step 1, determine the total number of long-stay residents with a selected target assessment (OBRA, PPS, or discharge) that meets the numerator inclusion criteria.

Step 3: Divide the results of step 2 by the results of step 1.

Step 4: Multiply the result of step 3 by 100 to obtain a percent value.

A description of the time period for the data included in this measure is provided in S.5 above.

Submission items

0686: Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (long stay)

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: N/A

5b.1 If competing, why superior or rationale for additive value: N/A – there are no competing measures for NQF #0686.

0684: Percent of Residents with a Urinary Tract Infection (Long-Stay)

5.1 Identified measures: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure

0281 : Urinary Tract Infection Admission Rate (PQI 12)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: 0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure This measure provides the Standardized Infection Ratio (SIR) of healthcare-associated, catheter-associated urinary tract infections (UTI) among patients in bedded inpatient care locations, except level II or level III neonatal intensive care units (NICU). This includes acute care general hospitals, long-term acute care hospitals, rehabilitation hospitals, oncology hospitals, and behavior health hospitals. The SIR is the ratio of the total number of observed healthcare-associated CAUTIs among patients in bedded inpatient care locations (excluding patients in Level II or III neonatal ICUs) to the total number of predicted healthcare-associated CAUTI among inpatient care locations under surveillance for CAUTI during the data period, based on the national CAUTI baseline. CAUTI prevention is important as it is associated with increased morbidity and mortality and higher healthcare costs. Although related to UTIs, CAUTIs reflect a distinct issue that may require different clinical intervention; as such, providers' efforts to prevent UTIs and CAUTIs may vary. For example, CAUTI prevention includes reducing the number of unnecessary indwelling catheters inserted, removing indwelling catheters at the earliest possible time, securing catheters to the patient's leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder, and utilizing aseptic technique for urinary catheter insertion. Nursing home factors and best practices associated with UTI prevention are described in Section 1b.1. above. In addition, it may be challenging to measure CAUTI in nursing homes due to concerns about the availability of onsite laboratory testing; subsequently, reportability of a nursing home CAUTI measure may be substantially diminished. 0281 : Urinary Tract Infection Admission Rate (PQI 12) This measure reports the rate of admissions with a principal diagnosis of urinary tract infection per 100,000 population, ages 18 years and older. Patients

with kidney or urinary tract disorder admissions, other indications of immunocompromised state admissions, obstetric admissions, and transfers from other institutions are excluded from the measure. Presence of a urinary tract infection is based on a principal diagnosis code (ICD-9) for UTI. UTIs in the adult population may generally be treated in ambulatory/outpatient care settings. However, when treatment is inadequate or delayed, patients may develop more severe clinical infections; as a result, they may be more likely to present at an emergency department and, subsequently, require inpatient admission. Therefore, access to sufficient outpatient care may be key to reducing urinary tract infection admissions. Although NQF #0281 and Percent of Residents With a Urinary Tract Infection (Long Stay) (NQF #0684) both capture UTI rates, they are intended for use in disparate populations (adults utilizing inpatient acute care vs. long-stay nursing home residents).

5b.1 If competing, why superior or rationale for additive value: This is not applicable. There are no competing measures for this QM. None of the measures listed in the response to Question 5 above have the same measure focus and the same measure target population. This measure is the most valid and efficient for capturing UTI among nursing home residents for purposes of improving genitourinary healthcare quality and resident safety in this domain.

Comparison of NQF #2456 and NQF #0097

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

0097: Medication Reconciliation Post-Discharge

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

0097: Medication Reconciliation Post-Discharge

National Committee for Quality Assurance

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

0097: Medication Reconciliation Post-Discharge

The percentage of discharges for patients 18 years of age and older for whom the discharge medication list was reconciled with the current medication list in the outpatient medical record by a prescribing practitioner, clinical pharmacist or registered nurse.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

0097: Medication Reconciliation Post-Discharge

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

0097: Medication Reconciliation Post-Discharge

Claims, Electronic Health Records, Paper Medical Records Health Plan Level:

- This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations via NCQA's online data submission system.

Physician Level:

- This measure is based on administrative claims to identify the eligible population and medical record documentation collected in the course of providing care to health plan patients to identify the numerator. In the PQRS program, this measure is coded using CPT and CPT Category II codes specific to quality measurement.

No data collection instrument provided Attachment Hospice_Value_Set.xlsx

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

0097: Medication Reconciliation Post-Discharge

Clinician : Group/Practice, Health Plan, Clinician : Individual, Integrated Delivery System

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

0097: Medication Reconciliation Post-Discharge

Clinician Office/Clinic

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse on or within 30 days of discharge. Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

0097: Medication Reconciliation Post-Discharge

This measure is specified for medical record or administrative data collection.

Medical Record Numerator Details:

- Documentation in the outpatient medical record must include evidence of medication reconciliation between the inpatient medication list and the medication list in the outpatient medical record, and the date on which it was performed. Any of the following evidence meets criteria: (1) Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in meds since discharge, same meds at discharge, discontinue all discharge meds), (2) Documentation of the patient's current medications with a notation that the discharge medications were reviewed, (3) Documentation that the provider "reconciled the current and discharge meds," (4) Documentation of a current medication list, a discharge medication list and notation that the appropriate practitioner type reviewed both lists on the same date of service, (5) Notation that no medications were prescribed or ordered upon discharge, (6) Evidence that the patient was seen for post-discharge follow-up with evidence of medication reconciliation or review, (7) Documentation in the discharge summary that the discharge medications were reconciled with the current medications. 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).

Administrative:

Medication Reconciliation CPT Codes:

- 99495: Transitional care management services with the following required elements: (1) communication (direct contact, telephone, electronic) with the patient and/or caregiver within 2 business days of discharge, (2) medical decision making of at least moderate complexity during the service period and (3) face-to-face visit, within 14 calendar days of discharge.
- 99496: Transitional care management services with the following required elements: (1) communication (direct contact, telephone, electronic) with the patient and/or caregiver within 2 business days of discharge, (2) medical decision making of high complexity during the service period and (3) face-to-face visit, within 7 calendar days of discharge.
- 1111F: Discharge med/current med merge

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

0097: Medication Reconciliation Post-Discharge

All discharges from an in-patient setting for patients who are 18 years and older.

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

0097: Medication Reconciliation Post-Discharge

The denominator for this measure is identified by administrative codes, which are specific to the level of reporting. The denominator for both levels of reporting is based on episodes, not patients. If patients have more than one discharge, include all discharges between January 1 and December 1 of the measurement year. This measure is stratified by age group so three denominator groups are identified for each level of reporting: Patients age 18-64, Patients age 65+ and all patients.

Health Plan Level:

Administrative:

- An acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year.
- Stratify the denominator by age group based on age as of December 31 of the measurement year: Patients 18-64 years of age; Patients 65 years of age and older; All Patients 18 years of age and older.

Physician Level:

- Patients who were discharged from an acute or nonacute inpatient facility on or between January 1 and December 1 of the measurement year and seen within 30 days following discharge in the office by the physician, prescribing practitioner, registered nurse, or clinical pharmacist providing on-going care. Codes to identify visit with on-going care provider are below.
- Stratify the denominator by age group based on age on the date of encounter: Patients 18-64 years of age; Patients 65 years of age and older; All Patients 18 years of age and older.

CPT encounter codes for visit with Ongoing Care Provider:

90791, 90792, 90832, 90834, 90837, 90839, 90845, 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, G0402, G0438, G0439

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

0097: Medication Reconciliation Post-Discharge

The following exclusions are applicable to the Health Plan Level measure.

- Exclude both the initial discharge and the readmission/direct transfer discharge if the readmission/direct transfer discharge occurs after December 1 of the measurement year.
- If the discharge is followed by a readmission or direct transfer to an acute or non-acute facility within the 30-day follow-up period, count only the readmission discharge or the discharge from the facility to which the patient was transferred.
- Exclude patients using hospice services anytime during the measurement year.

The following exclusions are applicable to the Physician Level measure.

- Exclude patients who use hospice services during the measurement period

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

0097: Medication Reconciliation Post-Discharge

For the Health Plan Level, exclude patients using hospice services anytime during the measurement year.

For the Physician Level, exclude patients who had a claim for hospice services (Hospice Value Set or G9691) during the measurement period. In the Quality Payment Program (QPP) this exclusion can be collected using G-codes specific to quality measurement: G9690.

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

0097: Medication Reconciliation Post-Discharge

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

0097: Medication Reconciliation Post-Discharge

N/A

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

0097: Medication Reconciliation Post-Discharge

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

0097: Medication Reconciliation Post-Discharge

Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older.

Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year. Stratify the patients by age groups. Exclude patients who received hospice services during the measurement year.

Step 3: Determine the number of patients who meet the numerator criteria as specified in section S.6 above. The numerator includes all patients who had a reconciliation of the discharge medications with the current medication list in the outpatient medical record documented.

Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2 for each age strata.

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

0097: Medication Reconciliation Post-Discharge

5.1 Identified measures: 0553 : Care for Older Adults (COA) – Medication Review

0646 : Reconciled Medication List Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

0419 : Documentation of Current Medications in the Medical Record

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details.

5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and an outpatient medication list conducted post hospital discharge by an ongoing care provider and documented in the outpatient record. The denominator for this measure is all patients 18+ discharged from an inpatient facility to the community.

Related Measures:

Measure 0553 is conducted at health plan level. This measure assesses annual outpatient medication review by a prescribing practitioner or clinical pharmacist among all patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure.

Measure 0646 is conducted at the facility level. This measure assesses whether the patient received a reconciled medication list at the time of discharge. The denominator for this measure is all patients, regardless of age, discharged from the hospital. This measure is only focused on the reconciliation of medications that were prescribed during the inpatient stay and looks to see if the patient themselves receive this reconciled list at discharge. This measure does not address whether a reconciled medication list is documented in the outpatient medical record. Therefore the measure focus is different from measure 0097, which focuses on whether or not a patients' discharge medications were reconciled with their current medications in the outpatient setting.

Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097.

Measure 0419 is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

0097: Medication Reconciliation Post-Discharge

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

0097: Medication Reconciliation Post-Discharge

National Committee for Quality Assurance

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

0097: Medication Reconciliation Post-Discharge

The percentage of discharges for patients 18 years of age and older for whom the discharge medication list was reconciled with the current medication list in the outpatient medical record by a prescribing practitioner, clinical pharmacist or registered nurse.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

0097: Medication Reconciliation Post-Discharge

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

0097: Medication Reconciliation Post-Discharge

Claims, Electronic Health Records, Paper Medical Records Health Plan Level:

- This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan patients. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from Health Maintenance Organizations via NCQA's online data submission system.

Physician Level:

- This measure is based on administrative claims to identify the eligible population and medical record documentation collected in the course of providing care to health plan patients to identify the numerator. In the PQRS program, this measure is coded using CPT and CPT Category II codes specific to quality measurement.

No data collection instrument provided Attachment Hospice_Value_Set.xlsx

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

0097: Medication Reconciliation Post-Discharge

Clinician : Group/Practice, Health Plan, Clinician : Individual, Integrated Delivery System

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

0097: Medication Reconciliation Post-Discharge

Clinician Office/Clinic

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

0097: Medication Reconciliation Post-Discharge

Medication reconciliation conducted by a prescribing practitioner, clinical pharmacist or registered nurse on or within 30 days of discharge. Medication reconciliation is defined as a type of review in which the discharge medications are reconciled with the most recent medication list in the outpatient medical record.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team's documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team's preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team's preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

0097: Medication Reconciliation Post-Discharge

This measure is specified for medical record or administrative data collection.

Medical Record Numerator Details:

- Documentation in the outpatient medical record must include evidence of medication reconciliation between the inpatient medication list and the medication list in the outpatient medical record, and the date on which it was performed. Any of the following evidence meets criteria: (1) Documentation of the current medications with a notation that references the discharge medications (e.g., no changes in meds since discharge, same meds at discharge, discontinue all discharge meds), (2) Documentation of the patient's current medications with a notation that the discharge medications were reviewed, (3) Documentation that the provider "reconciled the current and discharge meds," (4) Documentation of a current medication list, a discharge medication list and notation that the appropriate practitioner type reviewed both lists on the same date of service, (5) Notation that no medications were prescribed or ordered upon discharge, (6) Evidence that the patient was seen for post-discharge follow-up with evidence of medication reconciliation or review, (7) Documentation in the discharge summary that the discharge medications were reconciled with the current medications. 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).

Administrative:

Medication Reconciliation CPT Codes:

- 99495: Transitional care management services with the following required elements: (1) communication (direct contact, telephone, electronic) with the patient and/or caregiver within 2 business days of discharge, (2) medical decision making of at least moderate complexity during the service period and (3) face-to-face visit, within 14 calendar days of discharge.
- 99496: Transitional care management services with the following required elements: (1) communication (direct contact, telephone, electronic) with the patient and/or caregiver within 2 business days of discharge, (2) medical decision making of high complexity during the service period and (3) face-to-face visit, within 7 calendar days of discharge.
- 1111F: Discharge med/current med merge

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

0097: Medication Reconciliation Post-Discharge

All discharges from an in-patient setting for patients who are 18 years and older.

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

0097: Medication Reconciliation Post-Discharge

The denominator for this measure is identified by administrative codes, which are specific to the level of reporting. The denominator for both levels of reporting is based on episodes, not patients. If patients have more than one discharge, include all discharges between January 1 and December 1 of the measurement year. This measure is stratified by age group so three denominator groups are identified for each level of reporting: Patients age 18-64, Patients age 65+ and all patients.

Health Plan Level:

Administrative:

- An acute or nonacute inpatient discharge on or between January 1 and December 1 of the measurement year.

- Stratify the denominator by age group based on age as of December 31 of the measurement year: Patients 18-64 years of age; Patients 65 years of age and older; All Patients 18 years of age and older.

Physician Level:

- Patients who were discharged from an acute or nonacute inpatient facility on or between January 1 and December 1 of the measurement year and seen within 30 days following discharge in the office by the physician, prescribing practitioner, registered nurse, or clinical pharmacist providing on-going care. Codes to identify visit with on-going care provider are below.

- Stratify the denominator by age group based on age on the date of encounter: Patients 18-64 years of age; Patients 65 years of age and older; All Patients 18 years of age and older.

CPT encounter codes for visit with Ongoing Care Provider:

90791, 90792, 90832, 90834, 90837, 90839, 90845, 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, G0402, G0438, G0439

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

0097: Medication Reconciliation Post-Discharge

The following exclusions are applicable to the Health Plan Level measure.

- Exclude both the initial discharge and the readmission/direct transfer discharge if the readmission/direct transfer discharge occurs after December 1 of the measurement year.
- If the discharge is followed by a readmission or direct transfer to an acute or non-acute facility within the 30-day follow-up period, count only the readmission discharge or the discharge from the facility to which the patient was transferred.
- Exclude patients using hospice services anytime during the measurement year.

The following exclusions are applicable to the Physician Level measure.

- Exclude patients who use hospice services during the measurement period

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

0097: Medication Reconciliation Post-Discharge

For the Health Plan Level, exclude patients using hospice services anytime during the measurement year.

For the Physician Level, exclude patients who had a claim for hospice services (Hospice Value Set or G9691) during the measurement period. In the Quality Payment Program (QPP) this exclusion can be collected using G-codes specific to quality measurement: G9690.

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

0097: Medication Reconciliation Post-Discharge

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

0097: Medication Reconciliation Post-Discharge

N/A

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

0097: Medication Reconciliation Post-Discharge

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

0097: Medication Reconciliation Post-Discharge

Step 1: Determine the eligible population. The eligible population is all the patients aged 18 years and older.

Step 2: Determine number of patients meeting the denominator criteria as specified in section S.9 above. The denominator includes all patients discharged from an inpatient facility. Patients may be counted more than once in the denominator if they had more than one discharge during the measurement year. Stratify the patients by age groups. Exclude patients who received hospice services during the measurement year.

Step 3: Determine the number of patients who meet the numerator criteria as specified in section 5.6 above. The numerator includes all patients who had a reconciliation of the discharge medications with the current medication list in the outpatient medical record documented.

Step 4: Calculate the rate by dividing the total from Step 3 by the total from Step 2 for each age strata.

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

0097: Medication Reconciliation Post-Discharge

5.1 Identified measures: 0553 : Care for Older Adults (COA) – Medication Review

0646 : Reconciled Medication List Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

0419 : Documentation of Current Medications in the Medical Record

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: See 5b.1 for more details.

5b.1 If competing, why superior or rationale for additive value: This measure assesses medication reconciliation between a discharge medication list and an outpatient medication list conducted post hospital discharge by an ongoing care provider and documented in the outpatient record. The denominator for this measure is all patients 18+ discharged from an inpatient facility to the community.

Related Measures:

Measure 0553 is conducted at health plan level. This measure assesses annual outpatient medication review by a prescribing practitioner or clinical pharmacist among all patients aged 66+. A hospital discharge is not required to meet denominator criteria therefore the measure has a different target population than measure 0097 and is not a competing measure.

Measure 0646 is conducted at the facility level. This measure assesses whether the patient received a reconciled medication list at the time of discharge. The denominator for this measure is all patients, regardless of age, discharged from the hospital. This measure is only focused on the reconciliation of medications that were prescribed during the inpatient stay and looks to see if the patient themselves receive this reconciled list at discharge. This measure does not address whether a reconciled medication list is documented in the outpatient medical record. Therefore the measure focus is different from measure 0097, which focuses on whether or not a patients' discharge medications were reconciled with their current medications in the outpatient setting.

Measure 2456 is conducted at the hospital/acute facility level. This measure assesses the quality of the medication reconciliation process in the hospital by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. This process is completed by a trained pharmacist who at the time of admission, compares the admission orders to the preadmission medication list to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This measure does not address whether a reconciled medication list is documented in the outpatient medical record after discharge. Therefore the measure focus is different from measure 0097.

Measure 0419 is conducted at the provider level. This measure looks at the percentage of visits for all patients 18+ for which the eligible professional attests to documenting a list of current medications using all immediate resources available on the date of the encounter. The list must include all known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary supplements AND must contain the medications' name, dosage, frequency and route of administration. This measure only looks for documentation of current medications and is not focused on reconciling medications after a discharge. The measure has a different target population and measure focus and is therefore not competing.

Comparison of NQF #2456 and NQF #0419e

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

0419e: Documentation of Current Medications in the Medical Record

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

0419e: Documentation of Current Medications in the Medical Record

Centers for Medicare & Medicaid Services

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

0419e: Documentation of Current Medications in the Medical Record

For both the 2018 claims and registry specifications AND the 2019 performance period eMeasure (v8) the measure description is as follows:

Percentage of visits for patients aged 18 years and older for which the eligible professional or eligible clinician attests to documenting a list of current medications using all immediate resources available on the date of the encounter. This list must include ALL known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosage, frequency and route of administration.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

0419e: Documentation of Current Medications in the Medical Record

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

0419e: Documentation of Current Medications in the Medical Record

Claims, Electronic Health Records, Registry Data The data source is the medical record, which provides patient information for the encounter; Medicare Part B Claims and Registry data, and EHR reports.

No data collection instrument provided Attachment CMS68_QI130_NQF0419_NQF_AU_2018_S_2b__Code_Table_121218.xlsx

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

0419e: Documentation of Current Medications in the Medical Record

Clinician : Group/Practice, Clinician : Individual

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

0419e: Documentation of Current Medications in the Medical Record

Outpatient Services

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

0419e: Documentation of Current Medications in the Medical Record

Numerator statements for both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8) is as follows:

Eligible professional or eligible clinician attests to documenting, updating, or reviewing the patient's current medications using all immediate resources available on the date of the encounter. This list must include ALL prescriptions, over-the counters, herbals, vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosages, frequency, and route of administration.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a "gold-standard" preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team's documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team's preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team's preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

0419e: Documentation of Current Medications in the Medical Record

2018 claims and registry specifications: The numerator Quality-Data Coding Options for Reporting Satisfactorily:

Current Medications Documented

Performance Met: G8427: Eligible clinician attests to documenting in the medical record they obtained, updated, or reviewed the patient's current medications.

OR

Current Medications not Documented, Patient not Eligible

Denominator Exception: G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician

OR

Current Medications with Name, Dosage, Frequency, or Route not Documented, Reason not Given.

Performance Not Met: G8428: Current list of medications not documented as obtained, updated, or reviewed by the eligible professional, reason not given.

Definitions include:

Current Medications – Medications the patient is presently taking including all prescriptions, over-the-counters, herbals and vitamin/mineral/dietary (nutritional) supplements with each medication's name, dosage, frequency and administered route.

Route – Documentation of the way the medication enters the body (some examples include but are not limited to: oral, sublingual, subcutaneous injections, and/or topical).

Within the 2019 performance period eMeasure (v8), the numerator is defined as:

"Medications Documented During Qualifying Encounter":

"Qualifying Encounters During Measurement Period" QualifyingEncounterDuringMeasurementPeriod

with ["Procedure, Performed": "Documentation of current medications (procedure)"] MedicationsDocumented such that MedicationsDocumented.relevantPeriod during QualifyingEncounterDuringMeasurementPeriod.relevantPeriod

SNOMED-CT code (428191000124101) is used to capture the numerator.

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

0419e: Documentation of Current Medications in the Medical Record

Denominator statement for the 2018 claims and registry specifications is as follows: “All visits for patients aged 18 years and older.”

Denominator statement for the 2019 performance period eMeasure (v8) is “Equals Initial Population”. Initial Population is defined as: “All visits occurring during the 12 month measurement period for patients aged 18 years and older.”

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

0419e: Documentation of Current Medications in the Medical Record

For the purposes of defining the denominator in both the claims and registry and eMeasure versions, the denominator is defined by the patient’s age (based on patient’s date of birth), encounter date, denominator CPT or HCPCS codes.

2018 claims and registry specifications:

Denominator Criteria (Eligible Cases): Patients aged ≥ 18 years on date of encounter

AND

Patient encounter during the reporting period (CPT or HCPCS): 59400, 59510, 59610, 59618, 90791, 90792, 90832, 90834, 90837, 90839, 92002, 92004, 92012, 92014, 92507, 92508, 92526, 92537, 92538, 92540, 92541, 92542, 92544, 92545, 92547, 92548, 92550, 92557, 92567, 92568, 92570, 92585, 92588, 92626, 96116, 96150, 96151, 96152, 97127*, 97161, 97162, 97163, 97164, 97165, 97166, 97167, 97168, 97802, 97803, 97804, 98960, 98961, 98962, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99221, 99222, 99223, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, 99281, 99282, 99283, 99284, 99285, 99385*, 99386*, 99387*, 99395*, 99396*, 99397*, G0101, G0108, G0270, G0402, G0438, G0439 [*Signifies that this CPT Category I code is a non-covered service

under the PFS (Physician Fee Schedule). These non-covered services will not be counted in the denominator population for claims-based measures.]

Within the 2019 performance period eMeasure (v8), the denominator is defined as the initial population where:
"Qualifying Encounters During Measurement Period" QualifyingEncounter where "Patient Age 18 or Older at Start of Measurement Period"

The eMeasure denominator includes the above CPT and HCPCS codes as well as SNOMED-CT codes in the Medications Encounter Code Set Grouping Value set OID: 2.16.840.1.113883.3.600.1.1834.

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

0419e: Documentation of Current Medications in the Medical Record

Denominator exception for the 2018 claims and registry specifications is as follows:

A patient is not eligible if the following reason is documented: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status on the date of the encounter

Denominator exception for the 2019 performance period eMeasure (v8) is as follows:

Medical Reason: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

0419e: Documentation of Current Medications in the Medical Record

2018 claims and registry specifications:

Current Medications not Documented, Patient not Eligible

Denominator Exception G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician.

Within the 2019 performance period eMeasure (v8), the denominator exception is defined as:

"Qualifying Encounters During Measurement Period" EncounterDuringMeasurementPeriod
with "Medications Not Documented for Medical Reason" MedicationsNotDocumented

such that MedicationsNotDocumented.authorDatetime during EncounterDuringMeasurementPeriod.relevantPeriod
The eMeasure denominator exception includes codes in the value set Medical or Other reason not done SNOMED-CT Value Set OID 2.16.840.1.113883.3.600.1.1502 to capture the denominator exception.

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

0419e: Documentation of Current Medications in the Medical Record

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

0419e: Documentation of Current Medications in the Medical Record

This measure is not stratified.

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

0419e: Documentation of Current Medications in the Medical Record

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

0419e: Documentation of Current Medications in the Medical Record

For both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8), the performance calculation is as follows:

PERFORMANCE CALCULATION

To calculate provider performance, complete a fraction with the following measure components:

Numerator (A), Denominator (D), and Denominator Exceptions (C)

Numerator (A): Number of visits meeting numerator criteria

Denominator (D): Number of visits meeting criteria for denominator inclusion

Denominator Exceptions (C): Number of visits not meeting numerator criteria with valid exceptions

The method of performance calculation is determined by the following:

- 1) identify the visits that meet the eligibility criteria for the denominator (D) which includes patients who are 18 years and older with appropriate encounters as defined by encounter codes or encounter value set during the reporting period.
- 2) identify which visits meet the numerator criteria (A)
- 3) for those visits who do not meet the numerator criteria, determine whether an appropriate exception applies (C) and subtract those visits from the denominator with the following calculation:

Numerator (A)/[Denominator (D)– Denominator Exceptions (C)]

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

0419e: Documentation of Current Medications in the Medical Record

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0553 : Care for Older Adults (COA) – Medication Review

0554 : Medication Reconciliation Post-Discharge (MRP)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: NQF 0553 is the most similar conceptually to NQF 0419. NQF 0553 is a process measure that focuses solely on the elderly population (namely, those 66 years and older) and requires evidence of at least one medication review during the entire measurement year. Our measure (NQF 0419) encompasses a larger population (all adults 18 years of age and older) and requires a medication review at every encounter. Unlike NQF 0419, there is no e Measure available for NQF 0553. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events. NQF 0554 is a process measure focused on the elderly population (namely, those 66 years and older) that requires medication reconciliation within 30 days for patients discharged from the hospital. NQF 0419 is different from this measure in the following ways: (1) the population focus for NQF 0419 is inclusive of all patients 18 years and older, not just those 66 years and older discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient's discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0554 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events. NQF 0097 is a process measure that reflects follow-up care following discharge from an inpatient setting for patients aged 18 years and older (performance is stratified into two age groups: patients 18-65 and patients 65 and older) who are discharged from any inpatient facility. This measure requires that medication reconciliation be conducted if the patient is seen within 30 days of discharge following an inpatient hospitalization. NQF 0097 is only reported if a patient receives follow-up care within 30 days following discharge from any inpatient setting. NQF 0419 is different from this measure in the following ways: (1) the population of focus for NQF 0419 is inclusive of all patients 18 years and older, not just those discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient's discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0419 is appropriate for reporting by any EP and must be reported for every eligible encounter. Lastly, NQF 0097 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events.

5b.1 If competing, why superior or rationale for additive value: N/A

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

0419e: Documentation of Current Medications in the Medical Record

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

0419e: Documentation of Current Medications in the Medical Record

Centers for Medicare & Medicaid Services

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

0419e: Documentation of Current Medications in the Medical Record

For both the 2018 claims and registry specifications AND the 2019 performance period eMeasure (v8) the measure description is as follows:

Percentage of visits for patients aged 18 years and older for which the eligible professional or eligible clinician attests to documenting a list of current medications using all immediate resources available on the date of the encounter. This list must include ALL known prescriptions, over-the-counters, herbals, and vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosage, frequency and route of administration.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

0419e: Documentation of Current Medications in the Medical Record

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

0419e: Documentation of Current Medications in the Medical Record

Claims, Electronic Health Records, Registry Data The data source is the medical record, which provides patient information for the encounter; Medicare Part B Claims and Registry data, and EHR reports.

No data collection instrument provided Attachment CMS68_QI130_NQF0419_NQF_AU_2018_S_2b__Code_Table_121218.xlsx

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

0419e: Documentation of Current Medications in the Medical Record

Clinician : Group/Practice, Clinician : Individual

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

0419e: Documentation of Current Medications in the Medical Record

Outpatient Services

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

0419e: Documentation of Current Medications in the Medical Record

Numerator statements for both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8) is as follows:

Eligible professional or eligible clinician attests to documenting, updating, or reviewing the patient’s current medications using all immediate resources available on the date of the encounter. This list must include ALL prescriptions, over-the counters, herbals, vitamin/mineral/dietary (nutritional) supplements AND must contain the medications’ name, dosages, frequency, and route of administration.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

0419e: Documentation of Current Medications in the Medical Record

2018 claims and registry specifications: The numerator Quality-Data Coding Options for Reporting Satisfactorily:

Current Medications Documented

Performance Met: G8427: Eligible clinician attests to documenting in the medical record they obtained, updated, or reviewed the patient's current medications.

OR

Current Medications not Documented, Patient not Eligible

Denominator Exception: G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician

OR

Current Medications with Name, Dosage, Frequency, or Route not Documented, Reason not Given.

Performance Not Met: G8428: Current list of medications not documented as obtained, updated, or reviewed by the eligible professional, reason not given.

Definitions include:

Current Medications – Medications the patient is presently taking including all prescriptions, over-the-counters, herbals and vitamin/mineral/dietary (nutritional) supplements with each medication's name, dosage, frequency and administered route.

Route – Documentation of the way the medication enters the body (some examples include but are not limited to: oral, sublingual, subcutaneous injections, and/or topical).

Within the 2019 performance period eMeasure (v8), the numerator is defined as:

"Medications Documented During Qualifying Encounter":

"Qualifying Encounters During Measurement Period" `QualifyingEncounterDuringMeasurementPeriod`

with ["Procedure, Performed": "Documentation of current medications (procedure)"] `MedicationsDocumented` such that `MedicationsDocumented.relevantPeriod` during `QualifyingEncounterDuringMeasurementPeriod.relevantPeriod`

SNOMED-CT code (428191000124101) is used to capture the numerator.

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

0419e: Documentation of Current Medications in the Medical Record

Denominator statement for the 2018 claims and registry specifications is as follows: “All visits for patients aged 18 years and older.”

Denominator statement for the 2019 performance period eMeasure (v8) is “Equals Initial Population”. Initial Population is defined as: “All visits occurring during the 12 month measurement period for patients aged 18 years and older.”

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

0419e: Documentation of Current Medications in the Medical Record

For the purposes of defining the denominator in both the claims and registry and eMeasure versions, the denominator is defined by the patient’s age (based on patient’s date of birth), encounter date, denominator CPT or HCPCS codes.

2018 claims and registry specifications:

Denominator Criteria (Eligible Cases): Patients aged ≥ 18 years on date of encounter

AND

Patient encounter during the reporting period (CPT or HCPCS): 59400, 59510, 59610, 59618, 90791, 90792, 90832, 90834, 90837, 90839, 92002, 92004, 92012, 92014, 92507, 92508, 92526, 92537, 92538, 92540, 92541, 92542, 92544, 92545, 92547, 92548, 92550, 92557, 92567, 92568, 92570, 92585, 92588, 92626, 96116, 96150, 96151, 96152, 97127*, 97161, 97162, 97163, 97164, 97165, 97166, 97167, 97168, 97802, 97803, 97804, 98960, 98961, 98962, 99201, 99202, 99203, 99204, 99205, 99212, 99213, 99214, 99215, 99221, 99222, 99223, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, 99281, 99282, 99283, 99284, 99285, 99385*, 99386*, 99387*, 99395*, 99396*, 99397*, G0101, G0108, G0270, G0402, G0438, G0439 [*Signifies that this CPT Category I code is a non-covered service under the PFS (Physician Fee Schedule). These non-covered services will not be counted in the denominator population for claims-based measures.]

Within the 2019 performance period eMeasure (v8), the denominator is defined as the initial population where:

"Qualifying Encounters During Measurement Period" QualifyingEncounter where "Patient Age 18 or Older at Start of Measurement Period"

The eMeasure denominator includes the above CPT and HCPCS codes as well as SNOMED-CT codes in the Medications Encounter Code Set Grouping Value set OID: 2.16.840.1.113883.3.600.1.1834.

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

0419e: Documentation of Current Medications in the Medical Record

Denominator exception for the 2018 claims and registry specifications is as follows:

A patient is not eligible if the following reason is documented: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status on the date of the encounter

Denominator exception for the 2019 performance period eMeasure (v8) is as follows:

Medical Reason: Patient is in an urgent or emergent medical situation where time is of the essence and to delay treatment would jeopardize the patient's health status

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

0419e: Documentation of Current Medications in the Medical Record

2018 claims and registry specifications:

Current Medications not Documented, Patient not Eligible

Denominator Exception G8430: Eligible clinician attests to documenting in the medical record the patient is not eligible for a current list of medications being obtained, updated, or reviewed by the eligible clinician.

Within the 2019 performance period eMeasure (v8), the denominator exception is defined as:

"Qualifying Encounters During Measurement Period" EncounterDuringMeasurementPeriod
with "Medications Not Documented for Medical Reason" MedicationsNotDocumented

such that MedicationsNotDocumented.authorDatetime during EncounterDuringMeasurementPeriod.relevantPeriod

The eMeasure denominator exception includes codes in the value set Medical or Other reason not done SNOMED-CT Value Set OID 2.16.840.1.113883.3.600.1.1502 to capture the denominator exception.

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

0419e: Documentation of Current Medications in the Medical Record

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

0419e: Documentation of Current Medications in the Medical Record

This measure is not stratified.

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

0419e: Documentation of Current Medications in the Medical Record

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

0419e: Documentation of Current Medications in the Medical Record

For both the 2018 claims and registry specifications and the 2019 performance period eMeasure (v8), the performance calculation is as follows:

PERFORMANCE CALCULATION

To calculate provider performance, complete a fraction with the following measure components:

Numerator (A), Denominator (D), and Denominator Exceptions (C)

Numerator (A): Number of visits meeting numerator criteria

Denominator (D): Number of visits meeting criteria for denominator inclusion

Denominator Exceptions (C): Number of visits not meeting numerator criteria with valid exceptions

The method of performance calculation is determined by the following:

1) identify the visits that meet the eligibility criteria for the denominator (D) which includes patients who are 18 years and older with appropriate encounters as defined by encounter codes or encounter value set during the reporting period.

2) identify which visits meet the numerator criteria (A)

3) for those visits who do not meet the numerator criteria, determine whether an appropriate exception applies (C) and subtract those visits from the denominator with the following calculation:

Numerator (A)/[Denominator (D)– Denominator Exceptions (C)]

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

0419e: Documentation of Current Medications in the Medical Record

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0553 : Care for Older Adults (COA) – Medication Review

0554 : Medication Reconciliation Post-Discharge (MRP)

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: NQF 0553 is the most similar conceptually to NQF 0419. NQF 0553 is a process measure that focuses solely on the elderly population (namely, those 66 years and older) and requires

evidence of at least one medication review during the entire measurement year. Our measure (NQF 0419) encompasses a larger population (all adults 18 years of age and older) and requires a medication review at every encounter. Unlike NQF 0419, there is no e Measure available for NQF 0553. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events. NQF 0554 is a process measure focused on the elderly population (namely, those 66 years and older) that requires medication reconciliation within 30 days for patients discharged from the hospital. NQF 0419 is different from this measure in the following ways: (1) the population focus for NQF 0419 is inclusive of all patients 18 years and older, not just those 66 years and older discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient's discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0554 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events. NQF 0097 is a process measure that reflects follow-up care following discharge from an inpatient setting for patients aged 18 years and older (performance is stratified into two age groups: patients 18-65 and patients 65 and older) who are discharged from any inpatient facility. This measure requires that medication reconciliation be conducted if the patient is seen within 30 days of discharge following an inpatient hospitalization. NQF 0097 is only reported if a patient receives follow-up care within 30 days following discharge from any inpatient setting. NQF 0419 is different from this measure in the following ways: (1) the population of focus for NQF 0419 is inclusive of all patients 18 years and older, not just those discharged from an inpatient setting; (2) the medication list to be reviewed and documented at each visit for NQF 0419, not just a single visit within 30 days after a patient's discharge; and (3) NQF 0419 focuses on updating the patients medication list from any source and is not limited to the specific process of medication reconciliation. In addition, NQF 0419 is appropriate for reporting by any EP and must be reported for every eligible encounter. Lastly, NQF 0097 does not include an e Measure version. Although completing and documenting a medication review at every visit is more burdensome on physician practices, NQF 0419 provides more rigorous assessment of quality of care, as more frequent medication reviews allows for more rapid identification of medication discrepancies and is more likely to prevent adverse drug events.

5b.1 If competing, why superior or rationale for additive value: N/A

Comparison of NQF #2456 and NQF #0553

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

0553: Care for Older Adults (COA) – Medication Review

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

0553: Care for Older Adults (COA) – Medication Review

National Committee for Quality Assurance

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

0553: Care for Older Adults (COA) – Medication Review

Percentage of adults 65 years and older who had a medication review during the measurement year. A medication review is a review of all a patient's medications, including prescription medications, over-the-counter (OTC) medications and herbal or supplemental therapies by a prescribing practitioner or clinical pharmacist.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

0553: Care for Older Adults (COA) – Medication Review

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

0553: Care for Older Adults (COA) – Medication Review

Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from health plans via NCQA's online data submission system.

No data collection instrument provided Attachment 0553_COA_Med_Review_Value_Sets.xlsx

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

0553: Care for Older Adults (COA) – Medication Review

Health Plan

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

0553: Care for Older Adults (COA) – Medication Review

Outpatient Services

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

0553: Care for Older Adults (COA) – Medication Review

At least one medication review conducted by a prescribing practitioner or clinical pharmacist during the measurement year and the presence of a medication list in the medical record.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

0553: Care for Older Adults (COA) – Medication Review

This measure can be met using the administrative specification (using administrative claims codes) or the hybrid specification (using administrative claims codes and medical record review).

Administrative: Either of the following meet criteria:

- Both of the following during the same visit during the measurement year where the provider type is a prescribing practitioner or clinical pharmacist:
 - o At least one medication review (Medication Review Value Set).
 - o The presence of a medication list in the medical record (Medication List Value Set).
- Transitional care management services (Transitional Care Management Services Value Set).

Exclude services provided in an acute inpatient setting (Acute Inpatient Value Set; Acute Inpatient POS Value Set).

(See corresponding Excel document for the value sets referenced above.)

Hybrid: Documentation must come from the same medical record and must include one of the following:

- A medication list in the medical record, and evidence of a medication review by a prescribing practitioner or clinical pharmacist and the date when it was performed.
- Notation that the member is not taking any medication and the date when it was noted.

A review of side effects for a single medication at the time of prescription alone is not sufficient. An outpatient visit is not required to meet criteria. Do not include medication lists or medication reviews performed in an acute inpatient setting.

Prescribing practitioner is defined as a practitioner with prescribing privileges, including nurse practitioners, physician assistants and other non-MDs who have the authority to prescribe medications.

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

0553: Care for Older Adults (COA) – Medication Review

All patients 66 years and older as of the end (e.g., December 31) of the measurement year.

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

0553: Care for Older Adults (COA) – Medication Review

Use administrative data to identify all patients 66 years and older as of the end of the measurement year.

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

0553: Care for Older Adults (COA) – Medication Review

Exclude members who use hospice services.

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

0553: Care for Older Adults (COA) – Medication Review

Exclude members who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began. These members may be identified using various methods, which may include but are not limited to enrollment data, medical record or claims/encounter data (Hospice Value Set).

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

0553: Care for Older Adults (COA) – Medication Review

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

0553: Care for Older Adults (COA) – Medication Review

N/A

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

0553: Care for Older Adults (COA) – Medication Review

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

0553: Care for Older Adults (COA) – Medication Review

Step 1. Determine the eligible population: All patients 66 years and older as of the end (e.g., December 31) of the measurement year.

Step 2: Identify the denominator: Exclude any patients who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began.

The remainder is the eligible population

Step 3: Identify the numerator: Individuals in the denominator who have documentation of at least one medication review conducted by a prescribing practitioner or clinical pharmacist and have a medication list in their medical record.

Step 4: Calculate the rate: Numerator/Denominator

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures

with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

0553: Care for Older Adults (COA) – Medication Review

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0419 : Documentation of Current Medications in the Medical Record

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

3317 : Medication Reconciliation on Admission

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: See response in 5b.1 (response would not fit in this text box).

5b.1 If competing, why superior or rationale for additive value: ANSWER TO 5A.1:

NCQA is committed to harmonization across measures and reducing unnecessary burden in measurement. However, it is important to note that the numerator (the specific health care service) being reported in this measure (Measure 0553) differs from many of the other related measures.

Measures 0097, 2456, 3317, and 2988 address MEDICATION RECONCILIATION, which is a care service that includes compiling a list of medications the patient is currently taking and comparing it against a second list (generally a physician’s admission, transfer, and/or discharge orders) in order to reconcile discrepancies between the two lists and make sure the patient is prescribed the appropriate medications and to decrease the likelihood of adverse medication interactions.

This care service is different from a MEDICATION REVIEW, which is the focus of this submission (Measure 0553). In a medication review, the goal is a critical examination of all the medications a patient is taking with the objective of reaching an agreement with the patient about treatment, optimizing the impact of medicine, and minimizing medication-related problems.

A medication review is also different from a simple documentation of current medications in the medical record (the focus of Measure 0419e), because this measure involves a review of medications in addition to a documentation of the patient’s medications in the medical record.

Additional differences among the measures include level of accountability and target population, as demonstrated below:

0053: Care for Older Adults – Medication Review

Level of accountability: Health plan

Target population: Older adults (age 65 years and older)

0097: Medication Reconciliation Post Discharge

Level of accountability: Health plan

Target population: Adults 18+ discharged from hospital

0419e: Documentation of Current Medications in the Medical Record

Level of accountability: Individual clinician

Target population: Adults 18+

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Level of accountability: Facility (hospital)

Target population: Adults 18+ discharged from hospital

3317: Medication Reconciliation on Admission

Level of accountability: Facility (hospital)

Target population: Adults 18+ admitted to hospital

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Level of accountability: Facility (dialysis facility)

Target population: Adults permanently assigned to a dialysis facility

Evidence of performance gap and relation to risk of adverse events:

- Many medication errors occur during times of transition, when patients receive medications from different prescribers who lack access to patients' comprehensive medication list. Conducting medication reconciliation at major care transitions (eg, upon admission, upon discharge) may improve patients' ability to manage their medication regimen properly and reduce the number of medication errors (Measures #0097, 2456, 3317, 2988).
- Older adults are a vulnerable population and are more likely to have multiple comorbid conditions and thus be receiving multiple medications. This places them at higher risk of an adverse medication event, even without a care transition. This supports an annual medication review targeted specifically to older adults (Measure #0053). This measure is more specifically targeted to a vulnerable population and less burdensome to providers than a medication list documented at every medical visit (Measure #0419e).

ANSWER TO 5b.1:

While the other measures generally address a similar focus (medications), no other NQF-endorsed measures address both the same measure focus AND the same target population.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

0553: Care for Older Adults (COA) – Medication Review

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

0553: Care for Older Adults (COA) – Medication Review

National Committee for Quality Assurance

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

0553: Care for Older Adults (COA) – Medication Review

Percentage of adults 65 years and older who had a medication review during the measurement year. A medication review is a review of all a patient's medications, including prescription medications, over-the-counter (OTC) medications and herbal or supplemental therapies by a prescribing practitioner or clinical pharmacist.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

0553: Care for Older Adults (COA) – Medication Review

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

0553: Care for Older Adults (COA) – Medication Review

Claims, Electronic Health Records, Paper Medical Records This measure is based on administrative claims and medical record documentation collected in the course of providing care to health plan members. NCQA collects the Healthcare Effectiveness Data and Information Set (HEDIS) data for this measure directly from health plans via NCQA's online data submission system.

No data collection instrument provided Attachment 0553_COA_Med_Review_Value_Sets.xlsx

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

0553: Care for Older Adults (COA) – Medication Review

Health Plan

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

0553: Care for Older Adults (COA) – Medication Review

Outpatient Services

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

0553: Care for Older Adults (COA) – Medication Review

At least one medication review conducted by a prescribing practitioner or clinical pharmacist during the measurement year and the presence of a medication list in the medical record.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

0553: Care for Older Adults (COA) – Medication Review

This measure can be met using the administrative specification (using administrative claims codes) or the hybrid specification (using administrative claims codes and medical record review).

Administrative: Either of the following meet criteria:

- Both of the following during the same visit during the measurement year where the provider type is a prescribing practitioner or clinical pharmacist:
 - o At least one medication review (Medication Review Value Set).
 - o The presence of a medication list in the medical record (Medication List Value Set).
- Transitional care management services (Transitional Care Management Services Value Set).

Exclude services provided in an acute inpatient setting (Acute Inpatient Value Set; Acute Inpatient POS Value Set).

(See corresponding Excel document for the value sets referenced above.)

Hybrid: Documentation must come from the same medical record and must include one of the following:

- A medication list in the medical record, and evidence of a medication review by a prescribing practitioner or clinical pharmacist and the date when it was performed.
- Notation that the member is not taking any medication and the date when it was noted.

A review of side effects for a single medication at the time of prescription alone is not sufficient. An outpatient visit is not required to meet criteria. Do not include medication lists or medication reviews performed in an acute inpatient setting.

Prescribing practitioner is defined as a practitioner with prescribing privileges, including nurse practitioners, physician assistants and other non-MDs who have the authority to prescribe medications.

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

0553: Care for Older Adults (COA) – Medication Review

All patients 66 years and older as of the end (e.g., December 31) of the measurement year.

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

0553: Care for Older Adults (COA) – Medication Review

Use administrative data to identify all patients 66 years and older as of the end of the measurement year.

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

0553: Care for Older Adults (COA) – Medication Review

Exclude members who use hospice services.

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

0553: Care for Older Adults (COA) – Medication Review

Exclude members who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began. These members may be identified using various methods, which may include but are not limited to enrollment data, medical record or claims/encounter data (Hospice Value Set).

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

0553: Care for Older Adults (COA) – Medication Review

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

0553: Care for Older Adults (COA) – Medication Review

N/A

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

0553: Care for Older Adults (COA) – Medication Review

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

0553: Care for Older Adults (COA) – Medication Review

Step 1. Determine the eligible population: All patients 66 years and older as of the end (e.g., December 31) of the measurement year.

Step 2: Identify the denominator: Exclude any patients who use hospice services or elect to use a hospice benefit any time during the measurement year, regardless of when the services began.

The remainder is the eligible population

Step 3: Identify the numerator: Individuals in the denominator who have documentation of at least one medication review conducted by a prescribing practitioner or clinical pharmacist and have a medication list in their medical record.

Step 4: Calculate the rate: Numerator/Denominator

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures

with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

0553: Care for Older Adults (COA) – Medication Review

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0419 : Documentation of Current Medications in the Medical Record

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

3317 : Medication Reconciliation on Admission

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: See response in 5b.1 (response would not fit in this text box).

5b.1 If competing, why superior or rationale for additive value: ANSWER TO 5A.1:

NCQA is committed to harmonization across measures and reducing unnecessary burden in measurement. However, it is important to note that the numerator (the specific health care service) being reported in this measure (Measure 0553) differs from many of the other related measures.

Measures 0097, 2456, 3317, and 2988 address MEDICATION RECONCILIATION, which is a care service that includes compiling a list of medications the patient is currently taking and comparing it against a second list (generally a physician’s admission, transfer, and/or discharge orders) in order to reconcile discrepancies between the two lists and make sure the patient is prescribed the appropriate medications and to decrease the likelihood of adverse medication interactions.

This care service is different from a MEDICATION REVIEW, which is the focus of this submission (Measure 0553). In a medication review, the goal is a critical examination of all the medications a patient is taking with the objective of reaching an agreement with the patient about treatment, optimizing the impact of medicine, and minimizing medication-related problems.

A medication review is also different from a simple documentation of current medications in the medical record (the focus of Measure 0419e), because this measure involves a review of medications in addition to a documentation of the patient’s medications in the medical record.

Additional differences among the measures include level of accountability and target population, as demonstrated below:

0053: Care for Older Adults – Medication Review

Level of accountability: Health plan

Target population: Older adults (age 65 years and older)

0097: Medication Reconciliation Post Discharge

Level of accountability: Health plan

Target population: Adults 18+ discharged from hospital

0419e: Documentation of Current Medications in the Medical Record

Level of accountability: Individual clinician

Target population: Adults 18+

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Level of accountability: Facility (hospital)

Target population: Adults 18+ discharged from hospital

3317: Medication Reconciliation on Admission

Level of accountability: Facility (hospital)

Target population: Adults 18+ admitted to hospital

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Level of accountability: Facility (dialysis facility)

Target population: Adults permanently assigned to a dialysis facility

Evidence of performance gap and relation to risk of adverse events:

- Many medication errors occur during times of transition, when patients receive medications from different prescribers who lack access to patients' comprehensive medication list. Conducting medication reconciliation at major care transitions (eg, upon admission, upon discharge) may improve patients' ability to manage their medication regimen properly and reduce the number of medication errors (Measures #0097, 2456, 3317, 2988).
- Older adults are a vulnerable population and are more likely to have multiple comorbid conditions and thus be receiving multiple medications. This places them at higher risk of an adverse medication event, even without a care transition. This supports an annual medication review targeted specifically to older adults (Measure #0053). This measure is more specifically targeted to a vulnerable population and less burdensome to providers than a medication list documented at every medical visit (Measure #0419e).

ANSWER TO 5b.1:

While the other measures generally address a similar focus (medications), no other NQF-endorsed measures address both the same measure focus AND the same target population.

Comparison of NQF #2456 and NQF #2988

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Kidney Care Quality Alliance (KCQA)

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Percentage of patient-months for which medication reconciliation* was performed and documented by an eligible professional.**

* "Medication reconciliation" is defined as the process of creating the most accurate list of all home medications that the patient is taking, including name, indication, dosage, frequency, and route, by comparing the most recent medication list in the dialysis medical record to one or more external list(s) of medications obtained from a patient or caregiver (including patient-/caregiver-provided "brown bag" information), pharmacotherapy information network (e.g., Surescripts), hospital, or other provider.

** For the purposes of medication reconciliation, "eligible professional" is defined as: physician, RN, ARNP, PA, pharmacist, or pharmacy technician.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

2988:Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

2988:Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Electronic Health Data, Other Dialysis facility medical record; intended for use by CMS in its CROWNWeb ESRD Clinical Data Repository.

No data collection instrument provided No data dictionary

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

2988:Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Facility

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

2988:Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Post-Acute Care

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Number of patient-months for which medication reconciliation was performed and documented by an eligible professional during the reporting period.

The medication reconciliation MUST:

- Include the name or other unique identifier of the eligible professional;

AND

- Include the date of the reconciliation;

AND

- Address ALL known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana);

AND

- Address for EACH home medication: Medication name(1), indication(2), dosage(2), frequency(2), route of administration(2), start and end date (if applicable)(2), discontinuation date (if applicable)(2), reason medication was stopped or discontinued (if applicable)(2), and identification of individual who authorized stoppage or discontinuation of medication (if applicable)(2);

AND

- List any allergies, intolerances, or adverse drug events experienced by the patient.

1. For patients in a clinical trial, it is acknowledged that it may be unknown as to whether the patient is receiving the therapeutic agent or a placebo.

2. “Unknown” is an acceptable response for this field.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

2988:Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

NUMERATOR STEP 1. For each patient meeting the denominator criteria in the given calculation month, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month:

A. Facility attestation that during the calculation month:

1. The patient’s most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided “brown-bag” information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled;

AND

2. ALL of the following items were addressed for EACH identified medication:

- a) Medication name;
- b) Indication (or “unknown”);
- c) Dosage (or “unknown”);
- d) Frequency (or “unknown”);

- e) Route of administration (or “unknown”);
- f) Start date (or “unknown”);
- g) End date, if applicable (or “unknown”);
- h) Discontinuation date, if applicable (or “unknown”);
- i) Reason medication was stopped or discontinued, if applicable (or “unknown”); and
- j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or “unknown”);

AND

- 3. Allergies, intolerances, and adverse drug events were addressed and documented.
- B. Date of the medication reconciliation.
- C. Identity of eligible professional performing the medication reconciliation.

NUMERATOR STEP 2. Repeat “Numerator Step 1” for each month of the one-year reporting period to define the final numerator (patient-months).

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Total number of patient-months for all patients permanently assigned to a dialysis facility during the reporting period.

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

DENOMINATOR STEP 1. Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility in the given calculation month.

DENOMINATOR STEP 2. For all patients included in the denominator in the given calculation month in “Denominator Step 1”, identify and remove all in-center hemodialysis patients who received < 7 dialysis treatments in the calculation month.

DENOMINATOR STEP 3. Repeat “Denominator Step 1” and “Denominator Step 2” for each month of the one-year reporting period.

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

In-center patients who receive <7 hemodialysis treatments in the facility during the reporting month.

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

As detailed in “Denominator Step 2” above, transient patients, defined as in-center patients who receive <7 hemodialysis treatments in the facility during the reporting month, are excluded from the measure.

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Not applicable.

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Scores are calculated using the following algorithm. For each calculation month in the one-year reporting period:

1. IDENTIFY THE “RAW DENOMINATOR POPULATION”

Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility during the given calculation month.

2. REMOVE PATIENTS MEETING MEASURE EXCLUSION CRITERIA TO DEFINE THE “FINAL DENOMINATOR POPULATION” FOR THE CALCULATION MONTH

For all patients included in the denominator during the given calculation month in Step 1 above, identify and remove all in-center patients who received < 7 hemodialysis treatments during the given calculation month.

3. IDENTIFY THE “NUMERATOR POPULATION” FOR THE CALCULATION MONTH

For each patient remaining in the denominator during the given calculation month after Step 2, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month:

A. Facility attestation that during the calculation month:

1. The patient’s most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided “brown-bag” information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled;

AND

2. ALL of the following items were addressed for EACH identified medication:

a) Medication name;

- b) Indication (or “unknown”);
- c) Dosage (or “unknown”);
- d) Frequency (or “unknown”);
- e) Route of administration (or “unknown”);
- f) Start date (or “unknown”);
- g) End date, if applicable (or “unknown”);
- h) Discontinuation date, if applicable (or “unknown”);
- i) Reason medication was stopped or discontinued, if applicable (or “unknown”); and
- j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or “unknown”);

AND

3. Allergies, intolerances, and adverse drug events were addressed and documented.

B. Date of medication reconciliation.

C. Identity of eligible professional performing medication reconciliation.

4. CALCULATE THE PERFORMANCE SCORE FOR THE CALCULATION MONTH

Calculate the facility’s performance score for the given calculation month as follows:

Month’s Performance Score = Month’s Final Numerator Population ÷ Month’s Final Denominator Population

5. CALCULATE THE ANNUAL PERFORMANCE SCORE

Calculate the facility’s annual performance score as follows:

Facility’s Annual Performance Score = (Facility’s Month 1 Score + Month 2 Score +..... + Month 12 Score) ÷ 12

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken,

when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

2988:Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0554 : Medication Reconciliation Post-Discharge (MRP)

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities is harmonized with existing NQF-endorsed medication reconciliation measures in that all similarly specify that the medication reconciliation must address ALL prescriptions, over-the-counters,herbals,vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosage, frequency, and route. The KCQA measure, however, is unique among the currently endorsed medication reconciliation measures in that the level of analysis is the dialysis facility. The KCQA measure also moves beyond a single "check/box", specifying multiple components that must be met to be counted as a "success." It requires the following additional information on each medication, where applicable and known: indication, start and end date, discontinuation date, reason the medication was stopped or discontinued, and identification of the individual who authorized stoppage or discontinuation of the medication. Additionally, given the increasing frequency with which medical marijuana is prescribed, the KCQA measure specifies that this pharmacotherapeutic agent must be addressed during the reconciliation. KCQA believes these additional foci are necessary to ensure the medication reconciliation process is as comprehensive as possible to better identify and effectively address potential sources of adverse drug-related events and not function merely as a single "check-box" measure. Testing demonstrated these data elements are effectively captured and recorded in facility's electronic medical record systems during the routine medication reconciliation process.

5b.1 If competing, why superior or rationale for additive value: Not applicable; this medication management measure is unique in its specific focus on the ESRD population.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

2988:Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Kidney Care Quality Alliance (KCQA)

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Percentage of patient-months for which medication reconciliation* was performed and documented by an eligible professional.**

* "Medication reconciliation" is defined as the process of creating the most accurate list of all home medications that the patient is taking, including name, indication, dosage, frequency, and route, by comparing the most recent medication list in the dialysis medical record to one or more external list(s) of medications obtained from a patient or caregiver (including patient-/caregiver-provided "brown bag" information), pharmacotherapy information network (e.g., Surescripts), hospital, or other provider.

** For the purposes of medication reconciliation, "eligible professional" is defined as: physician, RN, ARNP, PA, pharmacist, or pharmacy technician.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Electronic Health Data, Other Dialysis facility medical record; intended for use by CMS in its CROWNWeb ESRD Clinical Data Repository.

No data collection instrument provided No data dictionary

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Facility

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Post-Acute Care

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Number of patient-months for which medication reconciliation was performed and documented by an eligible professional during the reporting period.

The medication reconciliation MUST:

- Include the name or other unique identifier of the eligible professional;

AND

- Include the date of the reconciliation;

AND

- Address ALL known home medications (prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements, and medical marijuana);

AND

- Address for EACH home medication: Medication name(1), indication(2), dosage(2), frequency(2), route of administration(2), start and end date (if applicable)(2), discontinuation date (if applicable)(2), reason medication was stopped or discontinued (if applicable)(2), and identification of individual who authorized stoppage or discontinuation of medication (if applicable)(2);

AND

- List any allergies, intolerances, or adverse drug events experienced by the patient.

1. For patients in a clinical trial, it is acknowledged that it may be unknown as to whether the patient is receiving the therapeutic agent or a placebo.

2. "Unknown" is an acceptable response for this field.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a "gold-standard" preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team's documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team's preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)

2. Reconciliation discrepancies: the medical team's preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

2988:Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

NUMERATOR STEP 1. For each patient meeting the denominator criteria in the given calculation month, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month:

A. Facility attestation that during the calculation month:

1. The patient's most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided "brown-bag" information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled;
AND

2. ALL of the following items were addressed for EACH identified medication:

- a) Medication name;
- b) Indication (or "unknown");
- c) Dosage (or "unknown");
- d) Frequency (or "unknown");
- e) Route of administration (or "unknown");
- f) Start date (or "unknown");
- g) End date, if applicable (or "unknown");
- h) Discontinuation date, if applicable (or "unknown");

- i) Reason medication was stopped or discontinued, if applicable (or “unknown”); and
- j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or “unknown”);

AND

3. Allergies, intolerances, and adverse drug events were addressed and documented.

B. Date of the medication reconciliation.

C. Identity of eligible professional performing the medication reconciliation.

NUMERATOR STEP 2. Repeat “Numerator Step 1” for each month of the one-year reporting period to define the final numerator (patient-months).

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Total number of patient-months for all patients permanently assigned to a dialysis facility during the reporting period.

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

DENOMINATOR STEP 1. Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility in the given calculation month.

DENOMINATOR STEP 2. For all patients included in the denominator in the given calculation month in “Denominator Step 1”, identify and remove all in-center hemodialysis patients who received < 7 dialysis treatments in the calculation month.

DENOMINATOR STEP 3. Repeat “Denominator Step 1” and “Denominator Step 2” for each month of the one-year reporting period.

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

In-center patients who receive <7 hemodialysis treatments in the facility during the reporting month.

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

As detailed in “Denominator Step 2” above, transient patients, defined as in-center patients who receive <7 hemodialysis treatments in the facility during the reporting month, are excluded from the measure.

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Not applicable.

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

Scores are calculated using the following algorithm. For each calculation month in the one-year reporting period:

1. IDENTIFY THE “RAW DENOMINATOR POPULATION”

Identify all in-center and home hemodialysis and peritoneal dialysis patients permanently assigned to the dialysis facility during the given calculation month.

2. REMOVE PATIENTS MEETING MEASURE EXCLUSION CRITERIA TO DEFINE THE “FINAL DENOMINATOR POPULATION” FOR THE CALCULATION MONTH

For all patients included in the denominator during the given calculation month in Step 1 above, identify and remove all in-center patients who received < 7 hemodialysis treatments during the given calculation month.

3. IDENTIFY THE “NUMERATOR POPULATION” FOR THE CALCULATION MONTH

For each patient remaining in the denominator during the given calculation month after Step 2, identify all patients with each of the following three numerator criteria (a, b, and c) documented in the facility medical record to define the numerator for that month:

A. Facility attestation that during the calculation month:

1. The patient’s most recent medication list in the dialysis medical record was reconciled to one or more external list(s) of medications obtained from the patient/caregiver (including patient-/caregiver-provided “brown-bag” information), pharmacotherapy information network (e.g., Surescripts®), hospital, or other provider AND that ALL known medications (prescriptions, OTCs, herbals, vitamin/mineral/dietary [nutritional] supplements, and medical marijuana) were reconciled;

AND

2. ALL of the following items were addressed for EACH identified medication:

- a) Medication name;
- b) Indication (or “unknown”);
- c) Dosage (or “unknown”);
- d) Frequency (or “unknown”);
- e) Route of administration (or “unknown”);
- f) Start date (or “unknown”);
- g) End date, if applicable (or “unknown”);

- h) Discontinuation date, if applicable (or “unknown”);
- i) Reason medication was stopped or discontinued, if applicable (or “unknown”); and
- j) Identification of individual who authorized stoppage or discontinuation of medication, if applicable (or “unknown”);

AND

- 3. Allergies, intolerances, and adverse drug events were addressed and documented.
- B. Date of medication reconciliation.
- C. Identity of eligible professional performing medication reconciliation.

4. CALCULATE THE PERFORMANCE SCORE FOR THE CALCULATION MONTH

Calculate the facility’s performance score for the given calculation month as follows:

Month’s Performance Score = Month’s Final Numerator Population ÷ Month’s Final Denominator Population

5. CALCULATE THE ANNUAL PERFORMANCE SCORE

Calculate the facility’s annual performance score as follows:

Facility’s Annual Performance Score = (Facility’s Month 1 Score + Month 2 Score +..... + Month 12 Score) ÷ 12

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

2988: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0554 : Medication Reconciliation Post-Discharge (MRP)

2456 : Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: Medication Reconciliation for Patients Receiving Care at Dialysis Facilities is harmonized with existing NQF-endorsed medication reconciliation measures in that all similarly specify that the medication reconciliation must address ALL prescriptions, over-the-counters, herbals, vitamin/mineral/dietary (nutritional) supplements AND must contain the medications' name, dosage, frequency, and route. The KCQA measure, however, is unique among the currently endorsed medication reconciliation measures in that the level of analysis is the dialysis facility. The KCQA measure also moves beyond a single "check/box", specifying multiple components that must be met to be counted as a "success." It requires the following additional information on each medication, where applicable and known: indication, start and end date, discontinuation date, reason the medication was stopped or discontinued, and identification of the individual who authorized stoppage or discontinuation of the medication. Additionally, given the increasing frequency with which medical marijuana is prescribed, the KCQA measure specifies that this pharmacotherapeutic agent must be addressed during the reconciliation. KCQA believes these additional foci are necessary to ensure the medication reconciliation process is as comprehensive as possible to better identify and effectively address potential sources of adverse drug-related events and not function merely as a single "check-box" measure. Testing demonstrated these data elements are effectively captured and recorded in facility's electronic medical record systems during the routine medication reconciliation process.

5b.1 If competing, why superior or rationale for additive value: Not applicable; this medication management measure is unique in its specific focus on the ESRD population.

Comparison of NQF #2456 and NQF #3317

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

3317: Medication Reconciliation on Admission

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

3317: Medication Reconciliation on Admission

Centers for Medicare & Medicaid Services

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

3317: Medication Reconciliation on Admission

Percentage of patients for whom a designated PTA medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

3317: Medication Reconciliation on Admission

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

3317: Medication Reconciliation on Admission

Electronic Health Records, Paper Medical Records The data dictionary and measure information form that provide instructions for abstracting the data for the measure are included with this application as an attachment. A structured chart abstraction tool with operational data definitions was developed in Microsoft Access for field testing. Prior to implementation, the measure developer will provide a finalized abstraction tool.

Available in attached appendix at A.1 No data dictionary

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

3317: Medication Reconciliation on Admission

Facility

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

3317: Medication Reconciliation on Admission

Inpatient/Hospital

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

3317: Medication Reconciliation on Admission

Number of patients for whom a designated Prior to Admission (PTA) medication list was generated by referencing one or more external sources of medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization when the admission date is Day 0.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team's documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team's preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team's preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

3317: Medication Reconciliation on Admission

The numerator is operationalized into three key criteria of the medication reconciliation process that must be met:

1. Medications taken by the patient prior to admission are documented on a designated PTA medication list.
2. The PTA medication list is generated using at least one external source to identify the medications taken by the patient prior to admission.
3. All medications listed on the PTA medication list have a reconciliation action to continue, discontinue, or modify by the end of Day 2 of the hospitalization, or if there are no medications on the PTA medication list, the prescriber has signed the document by the end of Day 2 of the hospitalization to indicate his/her review of the PTA medication list.

The first criterion requires that the medical record contain a designated PTA Medication List to document medications that the patient is taking prior to admission. Documenting PTA medications in a designated location eliminates the potential for duplicative or inconsistent documentation of medication histories, avoids the potential for omitted medications, and provides a master source of PTA medication for easy reference by providers. PTA medications may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This criterion aligns with one of the five elements of The Joint Commission's National Patient Safety Goal (NPSG.03.06.01) on medication reconciliation (The Joint Commission, 2016).

The second criterion requires that facilities consult at least one source external to the facility's records to increase comprehensive capture of all active medications on the PTA medication list. Incomplete or inaccurate PTA medication lists may result in inadequate medication reconciliation actions by the prescriber, which may lead to medication errors and ADEs. Given the absence of a single, accurate source of information on PTA medications (gold standard), the measure establishes a minimum standard for compiling PTA medication information rather than being prescriptive regarding which sources should be referenced. This requirement also aligns with other existing NQF-endorsed measures that focus on medication reconciliation. The measure allows for a wide-range of external sources to account for situations where the routinely consulted source fails to generate the information needed. For example, the patient may not be able or willing to provide information on PTA medications or a retail pharmacy may be closed or not willing to disclose PTA medications without obtaining prior patient consent. Therefore, to meet the External Source requirement, the facility can reference one or more of the following sources to compile the PTA medication list:

- Interview of the patient or patient proxy such as a caregiver
- Medication container brought in by patient or patient proxy
- Medication list brought by patient or patient proxy
- Patient support network, such as a group home
- Nursing home
- Outpatient prescriber or emergency department
- Retail pharmacy
- Prescription Drug Monitoring Program (PDMP)
- Electronic prescribing network system (e.g., Allscripts®, Surescripts®) or aggregate pharmacy billing records (such as, claims data using state/federal healthcare plans)

The third and final criterion requires that a licensed prescriber reconciles each medication on the PTA Medication List by the end of Day 2 of the hospitalization and documents whether the medication should be continued, discontinued, or modified. The date of admission is considered Day 0 and subsequent days are considered Day 1 and Day 2 for this measure. If there are no medications on the PTA medication list, the prescriber must sign the document by the end of Day 2 of the hospitalization to indicate his or her review of the PTA medication list for consideration in future treatment decisions. For example, information that indicates the patient is not taking any medications may be important to communicate to the treatment team because there may be a need to initiate treatment of indications that are discovered during admission. Signing the PTA medication list by the end of Day 2 of the hospitalization for patient admissions with no PTA medications also helps to improve communication between members of the care team and other providers during care transitions. To simplify chart abstraction and prevent abstractors from having to distinguish between medications, herbal supplements, and other remedies a patient might take, all entries on the PTA medication list must be reconciled to meet the requirements of the third criterion.

For additional details on each of the data elements included in the measure construct, refer to Appendix A.1, which includes the Data Dictionary and Data Collection Tool.

Citations

*The Joint Commission. (2016). National patient safety goals effective January 1, 2017: Hospital Accreditation Program. Retrieved from https://www.jointcommission.org/assets/1/6/NPSG_Chapter_HAP_Jan2017.pdf

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

3317: Medication Reconciliation on Admission

All patients admitted to an inpatient facility from home or a non-acute setting.

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

3317: Medication Reconciliation on Admission

All adult and pediatric patients admitted to an IPF are eligible to be sampled, regardless of insurance types.

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

3317: Medication Reconciliation on Admission

The measure applies two exclusion criteria to ensure that it is feasible to complete the medication reconciliation process on admission to the IPF:

1. Patients transferred from an acute care setting
2. Patient admissions with a length of stay less than or equal to 2 days

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

3317: Medication Reconciliation on Admission

Transfer from an Acute Care Setting:

The first exclusion criterion applies to patient admissions that result from a transfer from an acute care setting, such as another inpatient facility or inpatient unit. This exclusion is applied because medication reconciliation with outpatient medications may have been done at the transferring facility and different medication reconciliation processes are required at the receiving IPF for those admissions to focus on the regimen that was used in the transferring facility. Patient admissions from long-term care facilities and emergency departments are not considered transfers and are included in the denominator for the measure.

Length of Stay Less than or Equal to 2 Days:

The second exclusion criterion applies to patient admissions with lengths of stay shorter than the time needed to adequately complete the medication reconciliation process. The timeframe from admission needed to complete the medication reconciliation process was discussed with the TEP, which recommended a requirement to complete reconciliation by the end of Day 2 if the day of admission is Day 0. They cited instances where patients are admitted on weekends and outpatient providers are not available to ascertain PTA medications or where patients are not stable enough to provide information immediately upon admission. The measure developer also evaluated this timeframe empirically using the field testing data to determine when most facilities could complete the medication reconciliation process. Table 2b2.2 in the NQF Measure Testing Form contains all records with complete medication reconciliation for all medications on the PTA medication list and shows the percentage of those records that had completed the medication reconciliation in one day increments of time from admission. This analysis confirmed the appropriateness of the 2-day timeframe for completing the medication reconciliation process.

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

3317: Medication Reconciliation on Admission

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

3317: Medication Reconciliation on Admission

Not applicable because this measure is not stratified.

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

3317: Medication Reconciliation on Admission

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

3317: Medication Reconciliation on Admission

To calculate the performance score:

1. Start processing. Run cases that are included in the Initial Patient Population as follows:
 - a. Find the patients that the performance measure is designed to address (all adult and pediatric patients admitted to the inpatient facility from home or a non-acute setting with a length of stay greater than two days).
2. Check Length of Stay (calculated as the Discharge Date minus the Admission Date).
 - a. If the Length of Stay is greater 2 days, continue processing and proceed to Transfer From an Acute Care Setting.
 - b. If the Length of Stay is less than or equal to 2 days, the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
3. Check Transfer From an Acute Care Setting.
 - a. If the Transfer From an Acute Care Setting is equal to 1 (Yes), the case was admitted from a transfer from an acute care setting and the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
 - b. If the Transfer From an Acute Care Setting is equal to 2 (No), the case was admitted from an admission source other than an acute case setting. Continue processing and proceed to Designated PTA Medication List.
4. Check Designated PTA Medication List.
 - a. If the Designated PTA Medication List is equal to 1 (Yes), continue processing and proceed to External Source.
 - b. If the Designated PTA Medication List is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.

5. Check External Source.

- a. If External Source is equal to 1 (Yes), continue processing and proceed to Reconciliation Action.
- b. If External Source is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.

6. Check Reconciliation Action.

- a. If Reconciliation Action is equal to 1 (Yes) or 3 (N/A), continue processing and proceed to Reconciliation Action by End of Day 2.
- b. If Reconciliation Action is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.

7. Check Reconciliation Action by the end of Day 2 when the Admission date is Day 0.

- a. If Reconciliation Action by End of Day 2 is equal to 1 (Yes), the record will proceed to Measure Category Assignment of E and will be in the Numerator Population. Stop processing.
- b. If Reconciliation Action by End of Day 2 is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

3317: Medication Reconciliation on Admission

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0293 : Medication Information

0553 : Care for Older Adults (COA) – Medication Review

0646 : Reconciled Medication List Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: The Measure Developer evaluated existing measures in the NQF portfolio to determine whether the Medication Reconciliation on Admission measure would compete with existing measures. Among the five NQF-endorsed measures that evaluate the medication reconciliation process, three (NQF #0097, #0553, #2988) are specified for the outpatient setting and the two (NQF #0293 and #0646) that are specified for the inpatient setting focus on communication of information at discharge. Therefore, the Medication Reconciliation on Admission measure is the only measure that evaluates medication reconciliation on admission to an inpatient facility. To align definitions with other measures that establish a designated timeframe by which a given process must be completed from admission, the Measure Developer harmonized the Medication Reconciliation on Admission measure timeframes with the timeframe specifications of SUB-1 Alcohol Use Screening (NQF 1661) and TOB-1 Tobacco Use Screening (NQF 1651), developed by The Joint Commission. Both measures define the length of stay in calendar days. Standardizing definitions for calculating length of stay using the admission and discharge dates without factoring-in the admission and discharge times will not only help reduce confusion across measures but also help to improve the reliability of the measure scores by eliminating the need to capture times, which were found to be unreliable during field testing. To develop the three data elements associated with the medication reconciliation process, the Measure Developer compared the conceptual descriptions and definitions of five NQF-endorsed measures (NQF 0553, NQF 2988, NQF 0293, NQF 0646, and NQF 0097) that evaluate the medication reconciliation process. Four of the five measures explicitly require a designated medication list. For this measure, the Measure Developer operationalized that requirement with the Designated PTA Medication List data element. Of the three measures that required collection of medications, two had requirements for the types of sources that should be referenced to compile the list. For the Medication Reconciliation on Admission measure, the Measure Developer set to establish a minimum standard and aligned with the approach to require “one or more external sources.” While several measures required the type of information to be collected on each medication, the Measure Developer decided not to include those data elements in this measure given the high performance and low variation for those data elements in testing. Each of the measures defines the process of reconciling the medications on the list differently. The Measure Developer incorporated aspects of each definition that are most applicable to the IPF setting. For example, the Measure Developer aligned with measures that require that the reconciliation be completed by a prescriber and that there be documentation of whether each medication be continued, modified, or discontinued. Finally, the Measure Developer considered different approaches to scoring the measure. Four of the five NQF-endorsed measures require that all aspects of the medication reconciliation process be completed for a patient to pass the measure. The fifth measure evaluates the number of patient months for which the medication reconciliations were completed,

however, this is only applicable in the outpatient setting. Therefore, the Measure Developer aligned the scoring approach to produce measure scores that represent the percentage of patient admissions that meet all the medication reconciliation criteria.

5b.1 If competing, why superior or rationale for additive value: This measure complements other existing measures because it focuses on the completion of the medication reconciliation process by the end of Day 2 of the hospitalization to the facility, which is not addressed by any existing measure. Medication reconciliation on admission is important to inform accurate medication reconciliation at discharge, which is evaluated by two of the existing measures. Medication reconciliation on admission also ensures that efforts to reconcile medications in the outpatient setting are continued at the transition to the inpatient setting.

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

3317: Medication Reconciliation on Admission

Steward

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Brigham and Women's Hospital

3317: Medication Reconciliation on Admission

Centers for Medicare & Medicaid Services

Description

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

This measure assesses the actual quality of the medication reconciliation process by identifying errors in admission and discharge medication orders due to problems with the medication reconciliation process. The target population is any hospitalized adult patient. The time frame is the hospitalization period.

At the time of admission, the admission orders are compared to the preadmission medication list (PAML) compiled by trained pharmacist (i.e., the gold standard) to look for discrepancies and identify which discrepancies were unintentional using brief medical record review. This process is repeated at the time of discharge where the discharge medication list is compared to the PAML and medications ordered during the hospitalization.

3317: Medication Reconciliation on Admission

Percentage of patients for whom a designated PTA medication list was generated by referencing one or more external sources of PTA medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization.

Type

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Outcome

3317: Medication Reconciliation on Admission

Process

Data Source

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Electronic Health Data, Electronic Health Records, Instrument-Based Data, Other, Paper Medical Records Please see Med Rec Leapfrog Workbook Excel Attachment.

Available in attached appendix at A.1 Attachment MedRec_Workbook_Leapfrog_2017_Final_NQF.xlsx

3317: Medication Reconciliation on Admission

Electronic Health Records, Paper Medical Records The data dictionary and measure information form that provide instructions for abstracting the data for the measure are included with this application as an attachment. A structured chart abstraction tool with operational data definitions was developed in Microsoft Access for field testing. Prior to implementation, the measure developer will provide a finalized abstraction tool.

Available in attached appendix at A.1 No data dictionary

Level

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Facility

3317: Medication Reconciliation on Admission

Facility

Setting

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Inpatient/Hospital

3317: Medication Reconciliation on Admission

Inpatient/Hospital

Numerator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

For each sampled inpatient in the denominator, the total number of unintentional medication discrepancies in admission orders plus the total number of unintentional medication discrepancies in discharge orders.

3317: Medication Reconciliation on Admission

Number of patients for whom a designated Prior to Admission (PTA) medication list was generated by referencing one or more external sources of medications and for which all PTA medications have a documented reconciliation action by the end of Day 2 of the hospitalization when the admission date is Day 0.

Numerator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

First, a “gold-standard” preadmission medication history is taken by one or more trained pharmacists at each site. Every site can have a trained pharmacist. We have stopped calling them study pharmacists, just trained pharmacists. Pharmacist training materials have been developed to support pharmacists (please see training materials in attachment), which specifically reviews how to take a gold standard medication history, including compliance with a best practices checklist (see attached materials). The pharmacist utilizes all available sources of information to take the medication history, including subject and family/caregiver interviews, prescription pill bottles, outpatient electronic medical records, community pharmacy data, and prescription fill information (see Appendix A for complete protocol). The gold-standard medication history is taken within 24 hours of admission but after the medication history has been taken as part of usual care.

The resulting preadmission medication list is then compared with the medical team’s documented preadmission medication list and with all admission and discharge medication orders. Any discrepancies between the gold-standard history and medication orders are identified and reasons for these changes sought from the medical record. Pharmacists may also need to communicate directly with the medical team to clarify reasons for discrepancies, as needed. Medication discrepancies that are not clearly intentional are then recorded, along with the reason for the discrepancy:

1. History discrepancies: the order is incorrect because the medical team’s preadmission medication list is incorrect (e.g., the team did not know the patient was taking aspirin prior to admission, does not record it in the preadmission medication list, and therefore does not order it at admission)
2. Reconciliation discrepancies: the medical team’s preadmission medication list is correct, but there is still an error in the orders. For example, the team knew the patient was taking aspirin prior to admission and documents it in the preadmission medication list. The team decides to hold the aspirin on admission for a clinical reason such as bleeding, but the team forgets to restart the aspirin at discharge. The admission discrepancy would be considered intentional (no error, not counted in the numerator), but the discharge discrepancy would be counted as a reconciliation error.

The type of error should also be recorded: omission, discrepancy in dose, route, frequency, or formulation, or an additional medication. Lastly, the time of the error should be recorded: admission vs. discharge.

See attached materials for a flow diagram explaining how history discrepancies, reconciliation discrepancies (PowerPoint slides), intentional and unintentional discrepancies are defined and operationalized.

3317: Medication Reconciliation on Admission

The numerator is operationalized into three key criteria of the medication reconciliation process that must be met:

1. Medications taken by the patient prior to admission are documented on a designated PTA medication list.
2. The PTA medication list is generated using at least one external source to identify the medications taken by the patient prior to admission.
3. All medications listed on the PTA medication list have a reconciliation action to continue, discontinue, or modify by the end of Day 2 of the hospitalization, or if there are no medications on the PTA medication list, the prescriber has signed the document by the end of Day 2 of the hospitalization to indicate his/her review of the PTA medication list.

The first criterion requires that the medical record contain a designated PTA Medication List to document medications that the patient is taking prior to admission. Documenting PTA medications in a designated location eliminates the potential for duplicative or inconsistent documentation of medication histories, avoids the potential for omitted medications, and provides a master source of PTA medication for easy reference by providers. PTA medications may include prescriptions, over-the-counter medications, herbals, vitamin/mineral/dietary (nutritional) supplements, and/or medical marijuana. This criterion aligns with one of the five elements of The Joint Commission's National Patient Safety Goal (NPSG.03.06.01) on medication reconciliation (The Joint Commission, 2016).

The second criterion requires that facilities consult at least one source external to the facility's records to increase comprehensive capture of all active medications on the PTA medication list. Incomplete or inaccurate PTA medication lists may result in inadequate medication reconciliation actions by the prescriber, which may lead to medication errors and ADEs. Given the absence of a single, accurate source of information on PTA medications (gold standard), the measure establishes a minimum standard for compiling PTA medication information rather than being prescriptive regarding which sources should be referenced. This requirement also aligns with other existing NQF-endorsed measures that focus on medication reconciliation. The measure allows for a wide-range of external sources to account for situations where the routinely consulted source fails to generate the information needed. For example, the patient may not be able or willing to provide information on PTA medications or a retail pharmacy may be closed or not willing to disclose PTA medications without obtaining prior patient consent. Therefore, to meet the External Source requirement, the facility can reference one or more of the following sources to compile the PTA medication list:

- Interview of the patient or patient proxy such as a caregiver
- Medication container brought in by patient or patient proxy
- Medication list brought by patient or patient proxy

- Patient support network, such as a group home
- Nursing home
- Outpatient prescriber or emergency department
- Retail pharmacy
- Prescription Drug Monitoring Program (PDMP)
- Electronic prescribing network system (e.g., Allscripts®, Surescripts®) or aggregate pharmacy billing records (such as, claims data using state/federal healthcare plans)

The third and final criterion requires that a licensed prescriber reconciles each medication on the PTA Medication List by the end of Day 2 of the hospitalization and documents whether the medication should be continued, discontinued, or modified. The date of admission is considered Day 0 and subsequent days are considered Day 1 and Day 2 for this measure. If there are no medications on the PTA medication list, the prescriber must sign the document by the end of Day 2 of the hospitalization to indicate his or her review of the PTA medication list for consideration in future treatment decisions. For example, information that indicates the patient is not taking any medications may be important to communicate to the treatment team because there may be a need to initiate treatment of indications that are discovered during admission. Signing the PTA medication list by the end of Day 2 of the hospitalization for patient admissions with no PTA medications also helps to improve communication between members of the care team and other providers during care transitions. To simplify chart abstraction and prevent abstractors from having to distinguish between medications, herbal supplements, and other remedies a patient might take, all entries on the PTA medication list must be reconciled to meet the requirements of the third criterion.

For additional details on each of the data elements included in the measure construct, refer to Appendix A.1, which includes the Data Dictionary and Data Collection Tool.

Citations

*The Joint Commission. (2016). National patient safety goals effective January 1, 2017: Hospital Accreditation Program. Retrieved from https://www.jointcommission.org/assets/1/6/NPSG_Chapter_HAP_Jan2017.pdf

Denominator Statement

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

The patient denominator is the sum of the number of medications in the gold standard medication lists plus the number of unintentionally ordered additional medications in a random sample of all adults admitted to the hospital. Our recommendation is that 25 patients are sampled per month, or approximately 1 patient per weekday.

So, for example, if among those 25 patients, there are 110 gold standard medications and 40 unintentionally ordered additional medications, and 75 unintentional discrepancies are identified, the measure outcome would be $75/150 = 0.5$ discrepancies per medication per patient for that hospital for that month.

3317: Medication Reconciliation on Admission

All patients admitted to an inpatient facility from home or a non-acute setting.

Denominator Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients are randomly selected each day from a list of admitted patients the day before. A target number of patients are selected (e.g. one patient per weekday) and these patients are interviewed by the pharmacist.

3317: Medication Reconciliation on Admission

All adult and pediatric patients admitted to an IPF are eligible to be sampled, regardless of insurance types.

Exclusions

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Patients that are discharged or expire before a gold standard medication list can be obtained.

3317: Medication Reconciliation on Admission

The measure applies two exclusion criteria to ensure that it is feasible to complete the medication reconciliation process on admission to the IPF:

1. Patients transferred from an acute care setting
2. Patient admissions with a length of stay less than or equal to 2 days

Exclusion Details

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Please see exclusion listed above.

3317: Medication Reconciliation on Admission

Transfer from an Acute Care Setting:

The first exclusion criterion applies to patient admissions that result from a transfer from an acute care setting, such as another inpatient facility or inpatient unit. This exclusion is applied because medication reconciliation with outpatient medications may have been done at the transferring facility and different medication reconciliation processes are required at the receiving IPF for those admissions to focus on the regimen that was used in the transferring facility. Patient admissions from long-term care facilities and emergency departments are not considered transfers and are included in the denominator for the measure.

Length of Stay Less than or Equal to 2 Days:

The second exclusion criterion applies to patient admissions with lengths of stay shorter than the time needed to adequately complete the medication reconciliation process. The timeframe from admission needed to complete the medication reconciliation process was discussed with the TEP, which recommended a requirement to complete reconciliation by the end of Day 2 if the day of admission is Day 0. They cited instances where patients are admitted on weekends and outpatient providers are not available to ascertain PTA medications or where patients are not stable enough to provide information immediately upon admission. The measure developer also evaluated this timeframe empirically using the field testing data to determine when most facilities could complete the medication reconciliation process. Table 2b2.2 in the NQF Measure Testing Form contains all records with complete medication reconciliation for all medications on the PTA medication list and shows the percentage of those records that had completed the medication reconciliation in one day increments of time from admission. This analysis confirmed the appropriateness of the 2-day timeframe for completing the medication reconciliation process.

Risk Adjustment

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

No risk adjustment or risk stratification

3317: Medication Reconciliation on Admission

No risk adjustment or risk stratification

Stratification

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Stratification could be done by service if desired by NQF, for example: non-ICU medicine, non-ICU surgery, ICU, and other.

3317: Medication Reconciliation on Admission

Not applicable because this measure is not stratified.

Type Score

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

Continuous variable, e.g. average better quality = lower score

3317: Medication Reconciliation on Admission

Rate/proportion better quality = higher score

Algorithm

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

See Appendix Attached (2019 Leapfrog Hospital Town Hall Call-Medication Discrepancies for NQF-Final (PowerPoint Presentation))

3317: Medication Reconciliation on Admission

To calculate the performance score:

1. Start processing. Run cases that are included in the Initial Patient Population as follows:
 - a. Find the patients that the performance measure is designed to address (all adult and pediatric patients admitted to the inpatient facility from home or a non-acute setting with a length of stay greater than two days).
2. Check Length of Stay (calculated as the Discharge Date minus the Admission Date).
 - a. If the Length of Stay is greater 2 days, continue processing and proceed to Transfer From an Acute Care Setting.
 - b. If the Length of Stay is less than or equal to 2 days, the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
3. Check Transfer From an Acute Care Setting.
 - a. If the Transfer From an Acute Care Setting is equal to 1 (Yes), the case was admitted from a transfer from an acute care setting and the record will proceed to Measure Category Assignment of B and will not be in the Measure Population. Stop processing.
 - b. If the Transfer From an Acute Care Setting is equal to 2 (No), the case was admitted from an admission source other than an acute case setting. Continue processing and proceed to Designated PTA Medication List.
4. Check Designated PTA Medication List.
 - a. If the Designated PTA Medication List is equal to 1 (Yes), continue processing and proceed to External Source.
 - b. If the Designated PTA Medication List is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.
5. Check External Source.
 - a. If External Source is equal to 1 (Yes), continue processing and proceed to Reconciliation Action.
 - b. If External Source is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.
6. Check Reconciliation Action.
 - a. If Reconciliation Action is equal to 1 (Yes) or 3 (N/A), continue processing and proceed to Reconciliation Action by End of Day 2.
 - b. If Reconciliation Action is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.
7. Check Reconciliation Action by the end of Day 2 when the Admission date is Day 0.
 - a. If Reconciliation Action by End of Day 2 is equal to 1 (Yes), the record will proceed to Measure Category Assignment of E and will be in the Numerator Population. Stop processing.

b. If Reconciliation Action by End of Day 2 is equal to 2 (No), the record will proceed to Measure Category Assignment of D and will be in the Measure Population. Stop processing.

Submission items

2456: Medication Reconciliation: Number of Unintentional Medication Discrepancies per Patient

5.1 Identified measures:

5a.1 Are specs completely harmonized? No

5a.2 If not completely harmonized, identify difference, rationale, impact: The other measures focus on documentation of an action related to medication reconciliation or transmission of medication data across care transitions. These are fundamentally different than measure 2456, which focuses on the results of these medication reconciliation efforts: having accurate medication orders. The fundamental problem with several of these other measures is that it is easy to “check a box” documenting that a medication reconciliation step has been completed, but it does not mean it has been completed well. In fact, there are times where these documentation efforts can be counter-productive. For example, documenting that a complete medication history has been taken, when in fact it could not be done well, could actually impede transparency among providers and efforts to fix that history the next day. Having said that, there is clearly a role for these types of measures. Further efforts are needed to harmonize these measures with each other to produce a set of complementary measures that together provide a picture of the quality of medication reconciliation. Dr. Schnipper would be happy to be involved in these efforts.

5b.1 If competing, why superior or rationale for additive value: N/A

3317: Medication Reconciliation on Admission

5.1 Identified measures: 0097 : Medication Reconciliation Post-Discharge

0293 : Medication Information

0553 : Care for Older Adults (COA) – Medication Review

0646 : Reconciled Medication List Received by Discharged Patients (Discharges from an Inpatient Facility to Home/Self Care or Any Other Site of Care)

2988 : Medication Reconciliation for Patients Receiving Care at Dialysis Facilities

5a.1 Are specs completely harmonized? Yes

5a.2 If not completely harmonized, identify difference, rationale, impact: The Measure Developer evaluated existing measures in the NQF portfolio to determine whether the Medication Reconciliation on Admission measure would compete with existing measures. Among the five NQF-endorsed measures that evaluate the medication reconciliation process, three (NQF #0097, #0553, #2988) are specified for the outpatient setting and the two (NQF #0293 and #0646) that are specified for the inpatient setting focus on communication of information at discharge. Therefore, the Medication Reconciliation on Admission measure is the only measure that evaluates medication reconciliation on admission to an inpatient facility. To align definitions with other measures

that establish a designated timeframe by which a given process must be completed from admission, the Measure Developer harmonized the Medication Reconciliation on Admission measure timeframes with the timeframe specifications of SUB-1 Alcohol Use Screening (NQF 1661) and TOB-1 Tobacco Use Screening (NQF 1651), developed by The Joint Commission. Both measures define the length of stay in calendar days. Standardizing definitions for calculating length of stay using the admission and discharge dates without factoring-in the admission and discharge times will not only help reduce confusion across measures but also help to improve the reliability of the measure scores by eliminating the need to capture times, which were found to be unreliable during field testing. To develop the three data elements associated with the medication reconciliation process, the Measure Developer compared the conceptual descriptions and definitions of five NQF-endorsed measures (NQF 0553, NQF 2988, NQF 0293, NQF 0646, and NQF 0097) that evaluate the medication reconciliation process. Four of the five measures explicitly require a designated medication list. For this measure, the Measure Developer operationalized that requirement with the Designated PTA Medication List data element. Of the three measures that required collection of medications, two had requirements for the types of sources that should be referenced to compile the list. For the Medication Reconciliation on Admission measure, the Measure Developer set to establish a minimum standard and aligned with the approach to require “one or more external sources.” While several measures required the type of information to be collected on each medication, the Measure Developer decided not to include those data elements in this measure given the high performance and low variation for those data elements in testing. Each of the measures defines the process of reconciling the medications on the list differently. The Measure Developer incorporated aspects of each definition that are most applicable to the IPF setting. For example, the Measure Developer aligned with measures that require that the reconciliation be completed by a prescriber and that there be documentation of whether each medication be continued, modified, or discontinued. Finally, the Measure Developer considered different approaches to scoring the measure. Four of the five NQF-endorsed measures require that all aspects of the medication reconciliation process be completed for a patient to pass the measure. The fifth measure evaluates the number of patient months for which the medication reconciliations were completed, however, this is only applicable in the outpatient setting. Therefore, the Measure Developer aligned the scoring approach to produce measure scores that represent the percentage of patient admissions that meet all the medication reconciliation criteria.

5b.1 If competing, why superior or rationale for additive value: This measure complements other existing measures because it focuses on the completion of the medication reconciliation process by the end of Day 2 of the hospitalization to the facility, which is not addressed by any existing measure. Medication reconciliation on admission is important to inform accurate medication reconciliation at discharge, which is evaluated by two of the existing measures. Medication reconciliation on admission also ensures that efforts to reconcile medications in the outpatient setting are continued at the transition to the inpatient setting.

Comparison of NQF #3533e and NQF #3503e

3533e: Hospital Harm – Severe Hyperglycemia

3503e: Hospital Harm – Severe Hypoglycemia

Steward

3533e: Hospital Harm – Severe Hyperglycemia

Centers for Medicare & Medicaid Services (CMS)

3503e: Hospital Harm – Severe Hypoglycemia

Centers for Medicare & Medicaid Services (CMS)

Description

3533e: Hospital Harm – Severe Hyperglycemia

This ratio electronic clinical quality measure (eCQM) assesses the number of hospital days with a severe hyperglycemic event (a blood glucose result >300 mg/dL, or a day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL) per the total qualifying hospital days among inpatient encounters for patients 18 years and older who have either:

1. A diagnosis of diabetes mellitus,
2. Received at least one administration of insulin or an anti-diabetic medication during the hospital admission, or
3. Had an elevated blood glucose level (>200 mg/dL) during their hospital admission.

3503e: Hospital Harm – Severe Hypoglycemia

This electronic clinical quality measure (eCQM) assesses the proportion of inpatient admissions for patients aged 18 years and older who received at least one antihyperglycemic medication during their hospitalization, and who suffered a severe hypoglycemic event (blood glucose less than 40 mg/dL) within 24 hours of the administration of an antihyperglycemic agent.

Type

3533e: Hospital Harm – Severe Hyperglycemia

Outcome

3503e: Hospital Harm – Severe Hypoglycemia

Outcome

Data Source

3533e: Hospital Harm – Severe Hyperglycemia

Electronic Health Records Hospitals collect EHR data using certified electronic health record technology (CEHRT). The measure authoring tool (MAT) output, which includes the human readable and XML artifacts of the clinical quality language (CQL) for the eCQM are contained in the specifications attached. No additional tools are used for data collection for eCQMs.

No data collection instrument provided Attachment Hospital_Harm_Hyperglycemia_Feasibility_Scorecard.xlsx

3503e: Hospital Harm – Severe Hypoglycemia

Electronic Health Records Hospitals collect EHR data using certified electronic health record technology (CEHRT). The MAT output, which includes the human readable and XML artifacts of the clinical quality language (CQL) for the measure are contained in the eCQM specifications attached. No additional tools are used for data collection for eCQMs.

No data collection instrument provided Attachment Del18c2HOP5HarmsHypoFeasibilityScorecard12172018_v02.xlsx

Level

3533e: Hospital Harm – Severe Hyperglycemia

Facility

3503e: Hospital Harm – Severe Hypoglycemia

Facility

Setting

3533e: Hospital Harm – Severe Hyperglycemia

Inpatient/Hospital

3503e: Hospital Harm – Severe Hypoglycemia

Inpatient/Hospital

Numerator Statement

3533e: Hospital Harm – Severe Hyperglycemia

The total number of hyperglycemic days across all encounters divided by the total number of eligible days across all encounters. Hospital days are measured in 24-hour periods, starting from the time of arrival at the hospital (including Emergency Department).

Days with a hyperglycemic event are defined as:

- A day with at least one blood glucose value >300 mg/dL; or
- A day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL.

We do not count >300 mg/DL events the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before discharge, if it was less than 24 hours.

3503e: Hospital Harm – Severe Hypoglycemia

The number of inpatient admissions during which a test for blood glucose with a result less than 40 mg/dL (severe hypoglycemia) where the event follows the administration of an antihyperglycemic medication within 24 hours.

Numerator Details

3533e: Hospital Harm – Severe Hyperglycemia

This is an eQIM, and therefore uses electronic health record (EHR) data to calculate the measure score. The 24-hour window for data collection is during an inpatient hospitalization, beginning at hospital arrival (whether through the Emergency Department, observation stay, or direct admission to inpatient).

All data elements necessary to calculate this eQIM are defined within value sets available in the Value Set Authority Center (VSAC) and listed below.

Glucose tests are represented by LOINC codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134). Codes include laboratory and point-of-care glucose tests, including glucose in blood, serum or plasma, venous blood, and arterial blood; and fasting glucose in venous blood and serum or plasma.

To access the value sets for the eQIM, please visit the Value Set Authority Center (VSAC), sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

3503e: Hospital Harm – Severe Hypoglycemia

This is an eQIM, and therefore uses electronic health record data to calculate the measure score. The time period for data collection is during an inpatient hospitalization, beginning at hospital arrival (whether through Emergency Department, observation stay, or directly admitted as inpatient).

All data elements necessary to calculate this measure are defined within value sets available in the VSAC, and listed below.

Glucose tests are represented by LOINC Codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134). Codes include both laboratory and point-of-care glucose tests, including venous or arterial blood and serum or plasma.

The antihyperglycemic medications are defined by the value set of Hypoglycemics (2.16.840.1.113762.1.4.1179.3). This value set includes medications and insulin capable of causing hypoglycemia in a patient.

To access the value sets for the measure, please visit the Value Set Authority Center (VSAC), sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

Denominator Statement

3533e: Hospital Harm – Severe Hyperglycemia

The initial population is all patients 18 years and older at the start of the measurement period with a discharged inpatient hospital admission during the measurement period, as well as either:

1. A diagnosis of diabetes that starts before or during the encounter; or
2. Administration of at least one dose of insulin or any anti-diabetic medication during the encounter; or
3. Presence of at least one blood glucose value >200 mg/dL at any time during the encounter.

The eCQM includes inpatient encounters which began in the Emergency Department or in observation status.

The denominator is the total number of eligible days across all encounters which match the initial population criteria. We do not count the the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before the discharge, if it was less than 24 hours. By excluding the first 24 hours of admission, we allow for correction of severe hyperglycemia that was present on admission. By excluding the last time period before discharge if it was less than 24 hours, we account for the fact that hospitals may not always be able to check glucose during the last time period, especially if it is only a few hours long. Eligible encounters that exceed 10 days are truncated to equal 10 days.

3503e: Hospital Harm – Severe Hypoglycemia

All patients 18 years or older at the start of the encounter with a discharged inpatient hospital admission during the measurement period who were given at least one antihyperglycemic medication during their hospital stay. The measure includes inpatient admissions which began in the Emergency Department or in observation status.

Denominator Details

3533e: Hospital Harm – Severe Hyperglycemia

This eCQM includes all patients 18 years and older at the start of the measurement period, and all payers. The measurement period is 12 months.

- Glucose tests are represented by LOINC codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134).
- Inpatient Encounters are represented using the value set of SNOMEDCT codes (2.16.840.1.113883.3.666.5.307).
- Emergency Department Visits are represented using the value set of SNOMEDCT codes (2.16.840.1.113883.3.117.1.7.1.292).
- Observation Services are represented using the value set of SNOMEDCT codes (2.16.840.1.113762.1.4.1111.143).
- Patients who were given at least one administration of insulin or any anti-diabetic medication during the encounter are defined by the value set of RXNORM codes (2.16.840.1.113883.3.1260.1.1978). This value set includes medications and insulin capable of causing severe hyperglycemia (blood glucose value >300 mg/dL).
- Diabetes are represented using the value set of ICD10CM, ICD9CM, SNOMEDCT codes (2.16.840.1.113883.3.464.1003.103.12.1001). This value set includes patients diagnosed with diabetes before or during the encounter.

To access the value sets for the eCQM, please visit the Value Set Authority Center, sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

3503e: Hospital Harm – Severe Hypoglycemia

This measure includes all encounters aged 18 years and older at the time of admission, and all payers. Measurement period is one year. This measure is at the hospital-by-admission level; only one numerator event is counted per admission.

Inpatient Encounters are represented using the value set of Encounter Inpatient (2.16.840.1.113883.3.666.5.307).

Emergency Department visits are represented using the value set of Emergency Department Visit (2.16.840.1.113883.3.117.1.7.1.292).

Patients who had observation encounters are represented using the value set of Observation Services (2.16.840.1.113762.1.4.1111.143).

Encounters who were given at least one antihyperglycemic medication are defined by the value set of Hypoglycemics (2.16.840.1.113762.1.4.1179.3), which also defines the numerator medications. This value set includes medications and insulin capable of causing hypoglycemia in a patient.

To access the value sets for the measure, please visit the Value Set Authority Center, sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

Exclusions

3533e: Hospital Harm – Severe Hyperglycemia

N/A; there are no denominator exclusions.

3503e: Hospital Harm – Severe Hypoglycemia

N/A, there are no denominator exclusions.

Exclusion Details

3533e: Hospital Harm – Severe Hyperglycemia

N/A

3503e: Hospital Harm – Severe Hypoglycemia

N/A

Risk Adjustment

3533e: Hospital Harm – Severe Hyperglycemia

No risk adjustment or risk stratification

3503e: Hospital Harm – Severe Hypoglycemia

No risk adjustment or risk stratification

Stratification

3533e: Hospital Harm – Severe Hyperglycemia

N/A; this eQIM is not stratified.

3503e: Hospital Harm – Severe Hypoglycemia

N/A; this measure is not stratified.

Type Score

3533e: Hospital Harm – Severe Hyperglycemia

Ratio better quality = lower score

3503e: Hospital Harm – Severe Hypoglycemia

Rate/proportion better quality = lower score

Algorithm

3533e: Hospital Harm – Severe Hyperglycemia

Target population: Inpatient encounters, all payers, where individuals are aged 18 years and older at the start of the measurement period and have:

1. A diagnosis of diabetes that starts before or during the encounter; or
2. Administration of at least one dose of insulin or any anti-diabetic medication during the encounter; or
3. Presence of at least one blood glucose value >200 mg/dL at any time during the encounter.

To create the denominator:

1. If the inpatient encounter occurred during the measurement period, go to Step 2. If not, do not include in the denominator.
2. Determine the patient's age in years. The patient's age is equal to the measurement period start date minus the birth date. If the patient is at least 18 years old, go to Step 3. If less than 18 years old, do not include in the denominator.
3. Determine if the patient had a diagnosis of diabetes mellitus before or during the hospital encounter, or if the patient was administered at least one dose of insulin or an anti-diabetic medication during the encounter, or if the patient had a glucose level of >200 mg/dL during the hospital encounter. If any of these three conditions exist, then include in the denominator. If not, do not include in the denominator.
4. (As the denominator is measured in days, which are defined as 24-hour periods starting at the time of arrival to the hospital (including the Emergency Department)): if the 24-hour period is not the first 24-hour period of the hospital admission, and is not the last period prior to hospital discharge if less than 24 hours, then include in the denominator. If it is the first 24-hour period or the last period prior to discharge that is less than 24 hours, do not include in the denominator.

a) By excluding for >300 mg/dL events the first 24 hours of admission, we allow for correction of severe hyperglycemia that was present on admission. By excluding the last time period before discharge if it was less than 24 hours, we account for the fact that hospitals may not always be able to check glucose during the last time period, especially if it is only a few hours long.

To create the numerator:

1. During any 24-hour period from arrival to the hospital (including the Emergency Department) except for the first 24-hour period and the last period prior to hospital discharge if less than 24 hours, any 24-hour period with a blood glucose level >300 mg/dL;

Or

2. A 24-hour period in which a blood glucose value was not documented, and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL.

If either of these 2 events occur, then include in the numerator. If not, do not include in the numerator.

3503e: Hospital Harm – Severe Hypoglycemia

Target population: Inpatient admission encounters, all payer, where individuals are aged 18 years or older at the start of the admission and who were given at least one antihyperglycemic medication during their hospital stay, within the measurement period.

To create the denominator:

1. If the inpatient admission was during the measurement period, go to Step 2. If not, do not include in measure population.

2. Determine the patient's age in years. The patient's age is equal to the admission date minus the birth date. If the patient is 18 years or older, go to Step 3. If less than 18 years old, do not include in the measure population.

3. Determine if there was at least one antihyperglycemic medication (from the Hypoglycemic value set 2.16.840.1.113762.1.4.1179.3) administered during the inpatient hospitalization (including in the Emergency Department or observation stay if later converted into an inpatient admission). If not, do not include in the measure population.

To create the numerator, for each encounter identify:

1. Any instance of a test for blood glucose with a result less than 40 mg/dL during the encounter is considered a severe hypoglycemic event, including values from either laboratory or Point of Care (POC) testing.

2. For any value less than 40mg/dL, determine if there was an antihyperglycemic medication administered by hospital staff within the 24 hours before the event and during the hospitalization (including emergency department and observation stays contiguous with the admission). If not, do not include in the numerator.

a. The 24-hour time frame extends from the end of the medication administration to the start of the blood glucose test.

3. For any value less than 40mg/dL, do not include any events (identified in Step 1) if it was followed by a repeat POC test for blood glucose within 5 minutes of the initial test and with a result greater than 80 mg/dL.

a. Rationale: The measure logic does –not– require a repeat blood glucose test to be performed. The expectation is that in most cases of severe hypoglycemia, the clinical team will be treating the patient and will not immediately repeat the test. However, if the severe hypoglycemic event is suspected to be spurious, for example if the patient is clinically asymptomatic, and a repeat test is performed to confirm that suspicion, this step will remove false positives that can occur in POC testing to ensure hospitals are not penalized for erroneous results. The 5-minute time frame extends from the time that the initial blood glucose test was performed to the time that the repeat blood glucose test was performed.

Only the first qualifying severe hypoglycemic event is counted in the numerator, and only one severe hypoglycemic event is counted per encounter.

Submission items

3533e: Hospital Harm – Severe Hyperglycemia

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact: N/A

5b.1 If competing, why superior or rationale for additive value: N/A

3503e: Hospital Harm – Severe Hypoglycemia

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact: N/A

5b.1 If competing, why superior or rationale for additive value: N/A

3533e: Hospital Harm – Severe Hyperglycemia

3503e: Hospital Harm – Severe Hypoglycemia

Steward

3533e: Hospital Harm – Severe Hyperglycemia

Centers for Medicare & Medicaid Services (CMS)

3503e: Hospital Harm – Severe Hypoglycemia

Centers for Medicare & Medicaid Services (CMS)

Description

3533e: Hospital Harm – Severe Hyperglycemia

This ratio electronic clinical quality measure (eCQM) assesses the number of hospital days with a severe hyperglycemic event (a blood glucose result >300 mg/dL, or a day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is \geq 200 mg/dL) per the total qualifying hospital days among inpatient encounters for patients 18 years and older who have either:

1. A diagnosis of diabetes mellitus,
2. Received at least one administration of insulin or an anti-diabetic medication during the hospital admission, or
3. Had an elevated blood glucose level (>200 mg/dL) during their hospital admission.

3503e: Hospital Harm – Severe Hypoglycemia

This electronic clinical quality measure (eCQM) assesses the proportion of inpatient admissions for patients aged 18 years and older who received at least one antihyperglycemic medication during their hospitalization, and who suffered a severe hypoglycemic event (blood glucose less than 40 mg/dL) within 24 hours of the administration of an antihyperglycemic agent.

Type

3533e: Hospital Harm – Severe Hyperglycemia

Outcome

3503e: Hospital Harm – Severe Hypoglycemia

Outcome

Data Source

3533e: Hospital Harm – Severe Hyperglycemia

Electronic Health Records Hospitals collect EHR data using certified electronic health record technology (CEHRT). The measure authoring tool (MAT) output, which includes the human readable and XML artifacts of the clinical quality language (CQL) for the eCQM are contained in the specifications attached. No additional tools are used for data collection for eCQMs.

No data collection instrument provided Attachment Hospital_Harm_Hyperglycemia_Feasibility_Scorecard.xlsx

3503e: Hospital Harm – Severe Hypoglycemia

Electronic Health Records Hospitals collect EHR data using certified electronic health record technology (CEHRT). The MAT output, which includes the human readable and XML artifacts of the clinical quality language (CQL) for the measure are contained in the eCQM specifications attached. No additional tools are used for data collection for eCQMs.

No data collection instrument provided Attachment Del18c2HOP5HarmsHypoFeasibilityScorecard12172018_v02.xlsx

Level

3533e: Hospital Harm – Severe Hyperglycemia

Facility

3503e: Hospital Harm – Severe Hypoglycemia

Facility

Setting

3533e: Hospital Harm – Severe Hyperglycemia

Inpatient/Hospital

3503e: Hospital Harm – Severe Hypoglycemia

Inpatient/Hospital

Numerator Statement

3533e: Hospital Harm – Severe Hyperglycemia

The total number of hyperglycemic days across all encounters divided by the total number of eligible days across all encounters. Hospital days are measured in 24-hour periods, starting from the time of arrival at the hospital (including Emergency Department). Days with a hyperglycemic event are defined as:

- A day with at least one blood glucose value >300 mg/dL; or
- A day in which a blood glucose value was not documented and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL.

We do not count >300 mg/DL events the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before discharge, if it was less than 24 hours.

3503e: Hospital Harm – Severe Hypoglycemia

The number of inpatient admissions during which a test for blood glucose with a result less than 40 mg/dL (severe hypoglycemia) where the event follows the administration of an antihyperglycemic medication within 24 hours.

Numerator Details

3533e: Hospital Harm – Severe Hyperglycemia

This is an eQIM, and therefore uses electronic health record (EHR) data to calculate the measure score. The 24-hour window for data collection is during an inpatient hospitalization, beginning at hospital arrival (whether through the Emergency Department, observation stay, or direct admission to inpatient).

All data elements necessary to calculate this eQIM are defined within value sets available in the Value Set Authority Center (VSAC) and listed below.

Glucose tests are represented by LOINC codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134). Codes include laboratory and point-of-care glucose tests, including glucose in blood, serum or plasma, venous blood, and arterial blood; and fasting glucose in venous blood and serum or plasma.

To access the value sets for the eQIM, please visit the Value Set Authority Center (VSAC), sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

3503e: Hospital Harm – Severe Hypoglycemia

This is an eQIM, and therefore uses electronic health record data to calculate the measure score. The time period for data collection is during an inpatient hospitalization, beginning at hospital arrival (whether through Emergency Department, observation stay, or directly admitted as inpatient).

All data elements necessary to calculate this measure are defined within value sets available in the VSAC, and listed below.

Glucose tests are represented by LOINC Codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134). Codes include both laboratory and point-of-care glucose tests, including venous or arterial blood and serum or plasma.

The antihyperglycemic medications are defined by the value set of Hypoglycemics (2.16.840.1.113762.1.4.1179.3). This value set includes medications and insulin capable of causing hypoglycemia in a patient.

To access the value sets for the measure, please visit the Value Set Authority Center (VSAC), sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

Denominator Statement

3533e: Hospital Harm – Severe Hyperglycemia

The initial population is all patients 18 years and older at the start of the measurement period with a discharged inpatient hospital admission during the measurement period, as well as either:

1. A diagnosis of diabetes that starts before or during the encounter; or
2. Administration of at least one dose of insulin or any anti-diabetic medication during the encounter; or
3. Presence of at least one blood glucose value >200 mg/dL at any time during the encounter.

The eQIM includes inpatient encounters which began in the Emergency Department or in observation status.

The denominator is the total number of eligible days across all encounters which match the initial population criteria. We do not count the the first 24-hour period after admission to the hospital (including the Emergency Department) or the last time period before the discharge, if it was less than 24 hours. By excluding the first 24 hours of admission, we allow for correction of severe hyperglycemia that was present on admission. By excluding the last time period before discharge if it was less than 24 hours, we

account for the fact that hospitals may not always be able to check glucose during the last time period, especially if it is only a few hours long. Eligible encounters that exceed 10 days are truncated to equal 10 days.

3503e: Hospital Harm – Severe Hypoglycemia

All patients 18 years or older at the start of the encounter with a discharged inpatient hospital admission during the measurement period who were given at least one antihyperglycemic medication during their hospital stay. The measure includes inpatient admissions which began in the Emergency Department or in observation status.

Denominator Details

3533e: Hospital Harm – Severe Hyperglycemia

This eCQM includes all patients 18 years and older at the start of the measurement period, and all payers. The measurement period is 12 months.

- Glucose tests are represented by LOINC codes in the value set Glucose Lab Test (2.16.840.1.113762.1.4.1045.134).
- Inpatient Encounters are represented using the value set of SNOMEDCT codes (2.16.840.1.113883.3.666.5.307).
- Emergency Department Visits are represented using the value set of SNOMEDCT codes (2.16.840.1.113883.3.117.1.7.1.292).
- Observation Services are represented using the value set of SNOMEDCT codes (2.16.840.1.113762.1.4.1111.143).
- Patients who were given at least one administration of insulin or any anti-diabetic medication during the encounter are defined by the value set of RXNORM codes (2.16.840.1.113883.3.1260.1.1978). This value set includes medications and insulin capable of causing severe hyperglycemia (blood glucose value >300 mg/dL).
- Diabetes are represented using the value set of ICD10CM, ICD9CM, SNOMEDCT codes (2.16.840.1.113883.3.464.1003.103.12.1001). This value set includes patients diagnosed with diabetes before or during the encounter.

To access the value sets for the eCQM, please visit the Value Set Authority Center, sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

3503e: Hospital Harm – Severe Hypoglycemia

This measure includes all encounters aged 18 years and older at the time of admission, and all payers. Measurement period is one year. This measure is at the hospital-by-admission level; only one numerator event is counted per admission.

Inpatient Encounters are represented using the value set of Encounter Inpatient (2.16.840.1.113883.3.666.5.307).

Emergency Department visits are represented using the value set of Emergency Department Visit (2.16.840.1.113883.3.117.1.7.1.292).

Patients who had observation encounters are represented using the value set of Observation Services (2.16.840.1.113762.1.4.1111.143).

Encounters who were given at least one antihyperglycemic medication are defined by the value set of Hypoglycemics (2.16.840.1.113762.1.4.1179.3), which also defines the numerator medications. This value set includes medications and insulin capable of causing hypoglycemia in a patient.

To access the value sets for the measure, please visit the Value Set Authority Center, sponsored by the National Library of Medicine, at <https://vsac.nlm.nih.gov/>.

Exclusions

3533e: Hospital Harm – Severe Hyperglycemia

N/A; there are no denominator exclusions.

3503e: Hospital Harm – Severe Hypoglycemia

N/A, there are no denominator exclusions.

Exclusion Details

3533e: Hospital Harm – Severe Hyperglycemia

N/A

3503e: Hospital Harm – Severe Hypoglycemia

N/A

Risk Adjustment

3533e: Hospital Harm – Severe Hyperglycemia

No risk adjustment or risk stratification

3503e: Hospital Harm – Severe Hypoglycemia

No risk adjustment or risk stratification

Stratification

3533e: Hospital Harm – Severe Hyperglycemia

N/A; this eCQM is not stratified.

3503e: Hospital Harm – Severe Hypoglycemia

N/A; this measure is not stratified.

Type Score

3533e: Hospital Harm – Severe Hyperglycemia

Ratio better quality = lower score

3503e: Hospital Harm – Severe Hypoglycemia

Rate/proportion better quality = lower score

Algorithm

3533e: Hospital Harm – Severe Hyperglycemia

Target population: Inpatient encounters, all payers, where individuals are aged 18 years and older at the start of the measurement period and have:

1. A diagnosis of diabetes that starts before or during the encounter; or
2. Administration of at least one dose of insulin or any anti-diabetic medication during the encounter; or
3. Presence of at least one blood glucose value >200 mg/dL at any time during the encounter.

To create the denominator:

1. If the inpatient encounter occurred during the measurement period, go to Step 2. If not, do not include in the denominator.
2. Determine the patient's age in years. The patient's age is equal to the measurement period start date minus the birth date. If the patient is at least 18 years old, go to Step 3. If less than 18 years old, do not include in the denominator.
3. Determine if the patient had a diagnosis of diabetes mellitus before or during the hospital encounter, or if the patient was administered at least one dose of insulin or an anti-diabetic medication during the encounter, or if the patient had a glucose level of >200 mg/dL during the hospital encounter. If any of these three conditions exist, then include in the denominator. If not, do not include in the denominator.

4. (As the denominator is measured in days, which are defined as 24-hour periods starting at the time of arrival to the hospital (including the Emergency Department)): if the 24-hour period is not the first 24-hour period of the hospital admission, and is not the last period prior to hospital discharge if less than 24 hours, then include in the denominator. If it is the first 24-hour period or the last period prior to discharge that is less than 24 hours, do not include in the denominator.

a) By excluding for >300 mg/dL events the first 24 hours of admission, we allow for correction of severe hyperglycemia that was present on admission. By excluding the last time period before discharge if it was less than 24 hours, we account for the fact that hospitals may not always be able to check glucose during the last time period, especially if it is only a few hours long.

To create the numerator:

1. During any 24-hour period from arrival to the hospital (including the Emergency Department) except for the first 24-hour period and the last period prior to hospital discharge if less than 24 hours, any 24-hour period with a blood glucose level >300 mg/dL;

Or

2. A 24-hour period in which a blood glucose value was not documented, and it was preceded by two consecutive days where at least one glucose value is ≥ 200 mg/dL.

If either of these 2 events occur, then include in the numerator. If not, do not include in the numerator.

3503e: Hospital Harm – Severe Hypoglycemia

Target population: Inpatient admission encounters, all payer, where individuals are aged 18 years or older at the start of the admission and who were given at least one antihyperglycemic medication during their hospital stay, within the measurement period.

To create the denominator:

1. If the inpatient admission was during the measurement period, go to Step 2. If not, do not include in measure population.
2. Determine the patient's age in years. The patient's age is equal to the admission date minus the birth date. If the patient is 18 years or older, go to Step 3. If less than 18 years old, do not include in the measure population.
3. Determine if there was at least one antihyperglycemic medication (from the Hypoglycemic value set 2.16.840.1.113762.1.4.1179.3) administered during the inpatient hospitalization (including in the Emergency Department or observation stay if later converted into an inpatient admission). If not, do not include in the measure population.

To create the numerator, for each encounter identify:

1. Any instance of a test for blood glucose with a result less than 40 mg/dL during the encounter is considered a severe hypoglycemic event, including values from either laboratory or Point of Care (POC) testing.
2. For any value less than 40mg/dL, determine if there was an antihyperglycemic medication administered by hospital staff within the 24 hours before the event and during the hospitalization (including emergency department and observation stays contiguous with the admission). If not, do not include in the numerator.
 - a. The 24-hour time frame extends from the end of the medication administration to the start of the blood glucose test.
3. For any value less than 40mg/dL, do not include any events (identified in Step 1) if it was followed by a repeat POC test for blood glucose within 5 minutes of the initial test and with a result greater than 80 mg/dL.
 - a. Rationale: The measure logic does –not– require a repeat blood glucose test to be performed. The expectation is that in most cases of severe hypoglycemia, the clinical team will be treating the patient and will not immediately repeat the test. However, if the severe hypoglycemic event is suspected to be spurious, for example if the patient is clinically asymptomatic, and a repeat test is performed to confirm that suspicion, this step will remove false positives that can occur in POC testing to ensure hospitals are not penalized for erroneous results. The 5-minute time frame extends from the time that the initial blood glucose test was performed to the time that the repeat blood glucose test was performed.

Only the first qualifying severe hypoglycemic event is counted in the numerator, and only one severe hypoglycemic event is counted per encounter.

Submission items

3533e: Hospital Harm – Severe Hyperglycemia

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact: N/A

5b.1 If competing, why superior or rationale for additive value: N/A

3503e: Hospital Harm – Severe Hypoglycemia

5.1 Identified measures:

5a.1 Are specs completely harmonized?

5a.2 If not completely harmonized, identify difference, rationale, impact: N/A

5b.1 If competing, why superior or rationale for additive value: N/A

Appendix F: Pre-Evaluation Comments

As of January 21, 2020, no NQF member comments were received during the pre-commenting period.

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