



Measure Information

This document contains the information submitted by measure developers/stewards, but is organized according to NQF's measure evaluation criteria and process. The item numbers refer to those in the submission form but may be in a slightly different order here. In general, the item numbers also reference the related criteria (e.g., item 1b.1 relates to sub criterion 1b).

Brief Measure Information

NQF #: 0684

Corresponding Measures:

De.2. Measure Title: Percent of Residents with a Urinary Tract Infection (Long Stay)

Co.1.1. Measure Steward: Centers for Medicare & Medicaid Services

De.3. Brief Description of Measure: 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.

1b.1. Developer Rationale: Significance to Residents:

Nursing home residents frequently develop infections (Herzig et al., 2017) and, among these, urinary tract infections (UTIs) are the most common (Herzig et al., 2017; Smith et al., 2018). Symptoms of UTIs include fever, painful or difficult urination, increased frequency and urgency of urination, blood in the urine, low abdominal or flank pain or tenderness, and deterioration in mental status (such as increased confusion). Thus, improving quality of care in genitourinary health domains, including reducing UTIs, may improve quality of life for long-stay nursing home residents in part by decreasing associated signs and symptoms, especially those that cause pain or discomfort.

UTIs can also lead to serious corollary outcomes and complications, such as sepsis, hospitalization, emergency department use, delirium, or death (Castle et al., 2017; Wolff, 2016). For example, some residents who develop UTIs develop blood infections, and 10 percent of these patients die within one week (Gould et al., 2009). UTIs are also a leading cause of avoidable hospitalizations (Nelson & Flynn, 2015; Wolff et al., 2017). Additionally, an increasingly prevalent corollary outcome is antimicrobial resistance in UTIs. Antimicrobial resistance proliferates through inappropriate widespread antibiotic treatment of asymptomatic bacteriuria (often misdiagnosed as UTI), which has no benefits for patients and can cause potential harm such as adverse drug reactions, drug resistance, and subsequent antibiotic-resistant infections (Cooper et al., 2019; Crnich & Drinka, 2014). Therefore, reducing UTIs, as well as improving diagnosis and treatment of UTIs, may improve long-stay nursing home residents' health outcomes.

Gaps in Performance in Nursing Homes:

The UTI quality measure is the only measure in the current measure set that addresses infections and, thereby, is a very important indicator of how facilities prevent and manage infections. UTI rates have been linked to modifiable nursing home factors, such as nurse staffing levels and mix, administering medication on time and documenting nursing care, and education in catheterization protocols and infection prevention measures (Meddings et al., 2017; Trautner et al., 2017; Nelson & Flynn, 2015). This quality measure should encourage nursing homes to direct resources to these care domains.

Since many UTIs are related to catheters, this quality measure provides an additional incentive for the facility to monitor its catheter use (RTI, 2019b). Nursing homes also vary in their adoption of evidence-based practices for UTI prevention. Practices such as adhering to clinical guidelines, keeping the perineal area clean, ensuring hand hygiene, improving management of urinary incontinence, and implementing hydration regimens have been shown to be effective in preventing UTIs (Montoya et al., 2016; Meddings et al., 2017; Wolff et al., 2017). Thus, this quality measure may also promote wider use of these practices.

Gaps in Performance among Specific Groups of Nursing Home Residents:

There is some evidence in the literature of empirical relationships between patient characteristics and UTI rates:

1. One study identified a positive relationship between female gender and UTI rate (Gucwa et al., 2016).
2. White race has been found to be a predictor of UTIs (Hefelet al., 2017; Castle et al., 2017).

3. Older age is associated with higher rates of UTIs (Castle et al., 2017).
4. Higher rates of Medicaid coverage in a facility are negatively associated with UTI rates among non-catheterized residents and positively associated with UTI rates among catheterized residents (Castle et al., 2017).

Overall, these findings are consistent with RTI's analysis, which found that individuals who were of non-Hispanic white race/ethnicity, older, and female were slightly more likely than their counterparts to have a UTI. In addition, our analyses also demonstrated that individuals who were not eligible for Medicaid were slightly more likely than individuals who were eligible for Medicaid to have a UTI.

Importance to Stakeholders:

On May 23, 2019, RTI International convened a web-based technical expert panel (TEP) meeting to obtain expert input on future directions for measure development and maintenance of quality measures for nursing homes based on the Minimum Data Set (MDS) 3.0. In the pre-TEP survey, six out of 10 TEP members rated the UTI measure as "very important" (scoring it a 4 or 5 out of a scale from 1-5), according to the following criteria: is an established priority area (National Quality Strategy); has a demonstrated high-impact aspect of healthcare (e.g., affects large numbers); has external evidence of importance, such as consensus standards; and/or has evidence of disparities for the quality domain (RTI, 2019b).

The TEP noted that it was important to maintain public reporting of the UTI quality measure as it reflects a critical health outcome that warrants continued attention, citing significant negative outcomes of UTIs on nursing home residents' function, quality of life, and socialization. The TEP believed this quality measure was important for promoting quality improvement for the following reasons:

1. The UTI quality measure has an important role in promoting accountability and tracking urinary tract infection, allowing facilities to "identify patterns and implement solutions."
2. The presence of this quality measure keeps providers' efforts focused on improving accurate diagnosis and can also lead to improved antibiotic prescribing and antibiotic stewardship.
3. The TEP indicated the UTI quality measure encouraged investment in education and training for clinical and direct care staff.

Castle, N., Engberg, J. B., Wagner, L. M., & Handler, S. (2017). Resident and facility factors associated with the incidence of urinary tract infections identified in the nursing home Minimum Data Set. *Journal of Applied Gerontology*, 36(2), 173-194.

Cooper, D., McFarland, M., Petrilli, F., & Shells, C. (2019). Reducing inappropriate antibiotics for urinary tract infections in long-term care: A replication study. *Journal of Nursing Care Quality*, 34(1), 16-21.

Crnich, C. J. & Drinka, P. (2014). Improving the management of urinary tract infections in nursing homes: It's time to stop the tail from wagging the dog." *Annals of Long Term Care: Clinical Care and Aging*, 22(9), 32-36.

Gould CV, Umscheid CA, Agarwal R, Kuntz G, Pegues DA; the Healthcare Infection Control Practices Advisory Committee. Guideline for prevention of catheter-associated urinary tract infections 2009. Atlanta: Centers for Disease Control and Prevention, 2009. Available from <https://www.cdc.gov/infectioncontrol/pdf/guidelines/cauti-guidelines-H.pdf>.

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Meddings, J., Saint, S., Krein, S. L., Gaies, E., Reichert, H., Hickner, A.,...Mody, L. (2017). Systematic review of interventions to reduce urinary tract infection in nursing home residents. *Journal of Hospital Medicine*, 12(5), 356

Montoya, A., Cassone, M., & Mody, L. (2016). Infections in nursing homes: Epidemiology and prevention programs. *Clinics in Geriatric Medicine*, 32(3), 585-607.

Nelson, S. T., & Flynn, L. (2015). Relationship between missed care and urinary tract infections in nursing homes. *Geriatric Nursing*, 36(2), 126-130.

RTI analysis of MDS 3.0 episode files for Quarter 1, 2011–Quarter 3, 2018 (programming reference: KH46\hf15_request_684_31_32.log)

RTI International. (2019, June). Technical Expert Panel Summary Report: Maintenance of Nursing Home Quality Measures. Prepared under CMS Contract No. HHSM-500-2013-130151. Available at <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/TEP-Current-Panels.html>.

Smith, S. N., Greene, M. T., Mody, L., Banaszak-Holl, J., Petersen, L. D., & Meddings, J. (2018). Evaluation of the association between Nursing Home Survey on Patient Safety culture (NHSOPS) measures and catheter-associated urinary tract infections: Results of a national collaborative. *BMJ Quality & Safety*, 27(6), 464-473.

Trautner, B. W., Greene, M. T., Krein, S. L., Wald, H. L., Saint, S., Rolle, A. J.,...Mody, L. (2017). Infection prevention and antimicrobial stewardship knowledge for selected infections among nursing home personnel. *Infection Control & Hospital Epidemiology*, 38(1), 83-88.

Wolff, M. L., et al. (2016). An innovative quality assurance activity to reduce urinary tract infection rates in a green house skilled nursing setting." *Annals of Long Term Care*, 24(10), 17-20.

S.4. 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.

S.6. 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.

S.8. Denominator 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.

De.1. Measure Type: Outcome

S.17. Data Source: Assessment Data

S.20. Level of Analysis: Facility

IF Endorsement Maintenance – Original Endorsement Date: Mar 03, 2011 **Most Recent Endorsement Date:** Jul 31, 2020

IF this measure is included in a composite, NQF Composite#/title:

IF this measure is paired/grouped, NQF#/title:

De.4. IF PAIRED/GROUPED, what is the reason this measure must be reported with other measures to appropriately interpret results? Not applicable; this measure is not paired/grouped.

1. Evidence, Performance Gap, Priority – Importance to Measure and Report

Extent to which the specific measure focus is evidence-based, important to making significant gains in healthcare quality, and improving health outcomes for a specific high-priority (high-impact) aspect of healthcare where there is variation in or overall less-than-optimal performance. ***Measures must be judged to meet all sub criteria to pass this criterion and be evaluated against the remaining criteria.***

1a. Evidence to Support the Measure Focus – See attached Evidence Submission Form

[NQF_0684_UTI_Evidence_Form_10-31-19_508.docx](#)

1a.1 For Maintenance of Endorsement: Is there new evidence about the measure since the last update/submission?

Do not remove any existing information. If there have been any changes to evidence, the Committee will consider the new evidence. Please use the most current version of the evidence attachment (v7.1). Please use red font to indicate updated evidence.

Yes

1b. Performance Gap

Demonstration of quality problems and opportunity for improvement, i.e., data demonstrating:

- considerable variation, or overall less-than-optimal performance, in the quality of care across providers; and/or
- Disparities in care across population groups.

1b.1. Briefly explain the rationale for this measure (e.g., how the measure will improve the quality of care, the benefits or improvements in quality envisioned by use of this measure)

If a COMPOSITE (e.g., combination of component measure scores, all-or-none, any-or-none), *SKIP this question and answer the composite questions.*

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RTI International. (2019, June). Technical Expert Panel Summary Report: Maintenance of Nursing Home Quality Measures. Prepared under CMS Contract No. HHSM-500-2013-13015I. Available at <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/TEP-Current-Panels.html>.

Smith, S. N., Greene, M. T., Mody, L., Banaszak-Holl, J., Petersen, L. D., & Meddings, J. (2018). Evaluation of the association between Nursing Home Survey on Patient Safety culture (NHSOPS) measures and catheter-associated urinary tract infections: Results of a national collaborative. *BMJ Quality & Safety*, 27(6), 464-473.

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1b.2. Provide performance scores on the measure as specified (current and over time) at the specified level of analysis. (*This is*

required for maintenance of endorsement. Include mean, std dev, min, max, interquartile range, scores by decile. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities include.) This information also will be used to address the sub-criterion on improvement (4b1) under Usability and Use.

Current Measure Performance:

Below we present the distribution of facility-level scores on this quality measure in Quarter 3, 2018. Overall, 1,096,778 long-stay residents in 14,520 nursing homes are included in the analysis. The national facility-level mean score for this measure in Quarter 3, 2018 was 2.8% and the median score was 1.9%, suggesting a slight positive skew. The interquartile range for this measure was 4.2%. 32.3% of facilities had a perfect score of 0.0%. This analysis was restricted to facilities with at least 20 residents in the denominator, the minimum denominator threshold for public reporting.

In Quarter 3, 2018:

k (facilities) 14,520

n (residents) 1,096,778

mean 2.8%

standard deviation (SD) 3.4%

min 0.0%

max 38.6%

Interquartile Range 4.2%

10th percentile 0.0%

20th percentile 0.0%

30th percentile 0.0%

40th percentile 1.3%

50th percentile 1.9%

60th percentile 2.6%

70th percentile 3.6%

80th percentile 4.9%

90th percentile 7.2%

SOURCE: RTI analysis of MDS 3.0 episode file for Quarter 3, 2018 (kh29_47\hf362_request_q3132_684.log).

Performance Over Time:

For comparison over time, we also present the distribution of facility-level scores on this quality measure in Quarter 2, 2013 (last presented to NQF during endorsement maintenance). During this time period, 1,108,999 long-stay residents in 13,640 nursing homes are included in the analysis. The national facility-level mean score for this measure in Quarter 2, 2013 was 6.2% and the median score was 5.3%, indicating a slight positive skew. The interquartile range for this measure was 6.4%. At least 10% of facilities had a perfect score of 0.0%. This analysis was restricted to facilities with at least 30 residents in the denominator, the minimum denominator threshold for public reporting at the time of analysis. Note, the Nursing Home Compare site changed their public reporting restrictions from 30 qualifying residents to 20 qualifying residents for long-stay measures, effective July 2016; when the minimum denominator threshold was larger, fewer facilities had publicly reportable scores.

In Quarter 2, 2013:

k (facilities) 13,640

n (residents) 1,108,999

mean 6.2%

standard deviation (SD) 5.0%

min 0.0%

max 38.5%

Interquartile Range 6.4%

10th percentile 0.0%

20th percentile 2.0%

30th percentile 3.0%

40th percentile 4.2%

50th percentile 5.3%

60th percentile 6.5%

70th percentile 8.1%

80th percentile 9.9%
90th percentile 12.9%

SOURCE: RTI analysis of MDS 3.0 episode file for Quarter 2, 2013 (db277\db277_request.log).

National facility-level mean and median scores for all available quarters (i.e., Quarter 1, 2011, to Quarter 3, 2018) are presented in the response to 2b1.3. in the Testing Attachment. After an early increase in mean and median scores, the national facility-level mean and median scores have trended steadily downward since the adoption of the MDS 3.0, indicating a general improvement in performance over time. The mean score for this measure was 7.5% in Quarter 1, 2011, and the median score was 6.5%. In Quarter 3, 2018, the mean and median scores were 2.8% and 1.9%, respectively.

SOURCE: RTI analysis of MDS 3.0 episode files for Quarter 1, 2011–Quarter 3, 2018 (programming reference: KH46\hf15_request_684_31_32.log)

1b.3. If no or limited performance data on the measure as specified is reported in 1b2, then provide a summary of data from the literature that indicates opportunity for improvement or overall less than optimal performance on the specific focus of measurement.

This is not applicable. Data are available and described in 1b2. The data is not an estimate based on samples; rather, it includes all nursing home residents nationally who do not meet exclusion criteria.

1b.4. Provide disparities data from the measure as specified (current and over time) by population group, e.g., by race/ethnicity, gender, age, insurance status, socioeconomic status, and/or disability. (*This is required for maintenance of endorsement. Describe the data source including number of measured entities; number of patients; dates of data; if a sample, characteristics of the entities included.*) For measures that show high levels of performance, i.e., “topped out”, disparities data may demonstrate an opportunity for improvement/gap in care for certain sub-populations. This information also will be used to address the sub-criterion on improvement (4b1) under Usability and Use.

Current Measure Performance:

We used national Minimum Data Set (MDS) 3.0 data to create the long-stay nursing home resident episode file for Quarter 3, 2018, to examine whether there may be disparities in care for population groups related to this measure. Disparities for certain population groups would indicate gaps in care and opportunities for improvement. In Quarter 3, 2018, there were 15,299 eligible facilities containing 1,104,673 residents eligible for inclusion in the measure (with both prior and target assessments); 14,520 facilities (95.0%) containing 1,096,778 residents (99.3%) had sufficient sample size (20 or more long-stay residents included in the denominator) to report on this measure.

We address the issue of disparities for this measure by examining whether there are differences in UTI rates for population groups that may reflect disparities in care, such as for population groups with social risk factors. We also examine facility-level performance gaps by concentration of racial/ethnic minority residents and Medicaid-eligible residents (may be a limited indicator of low socioeconomic status and/or indicative of the long-stay nursing home population receiving custodial care).

At the resident-level, we examined whether 4 social risk factors were associated with triggering the numerator for the UTI quality measure: 1) Medicaid eligibility; 2) race/ethnicity; 3) age (85 years and older); and 4) sex/gender. Details on how these variables were derived from the MDS 3.0 are provided in Section 2b3.3b. of the Testing Attachment.

We conducted the following analyses to examine the effect of the 4 social risk factors:

1. We calculated the percentage of residents with and without each social risk factor who had a documented UTI per MDS 3.0 guidelines and the p-value for the Chi-squared test of differences among population groups;
2. We calculated the percentage of residents with a UTI individually among more granular race/ethnicity categories and conducted an Analysis of Variance (ANOVA) to test whether differences were statistically significant.

1. Differences in performance among specific groups of nursing home residents were small but statistically significant. Among residents who were eligible for Medicaid, 2.46% had a urinary tract infection and, among those ineligible for Medicaid, 3.35% had a urinary tract infection ($\chi^2(1) = 324.39, p < .001$). Among non-Hispanic white residents, 2.88% had a UTI, compared with 1.92% of non-white residents ($\chi^2(1) = 765.46, p < .001$). Among residents aged 85 years or older, 2.76% had a UTI, compared with 2.52% of younger residents ($\chi^2(1) = 60.50, p < .001$). In addition, whereas 2.20% of male residents had a UTI, 2.84% of female residents had a UTI ($\chi^2(1) = 405.96, p < .001$). Overall, individuals who were non-Hispanic white, older, female, and not eligible for Medicaid were

slightly more likely than their counterparts to have a UTI. Additional information on social risk factor testing, including relevant citations that establish a conceptual framework from the literature review, is provided in the Testing Attachment.

2. At the resident-level, we also compared numerator triggering for this quality measure across more granular racial/ethnic groups. The highest percentage of long-stay residents with a urinary tract infection was found in American Indian or Alaska Native residents (3.0%), followed by White residents (2.9%), Black or African American residents (2.6%), Hispanic or Latino residents (2.0%), Native Hawaiian or Other Pacific Islander residents (1.7%), and Asian residents, who had the lowest percentage of long-stay residents with a UTI (1.6%). Using an ANOVA, differences in the proportion of residents with UTI by racial/ethnic group were found to be statistically significant ($p < 0.001$) (RTI, 2019b).

At the facility-level, we compared facility performance on this quality measure in facilities with different proportions of non-Hispanic white and non-white residents. We examined differences in the percentage of long-stay nursing home residents with a UTI across two groups: facilities with proportions of non-Hispanic white residents that were greater than or equal to the median proportion (86.8%) among facilities with sufficient sample size to meet minimum public reporting requirements (≥ 20 episodes in the denominator), and facilities with a smaller proportion of non-Hispanic white residents (i.e., a larger proportion of non-white residents) than the median proportion. Facilities with a higher proportion of white residents had statistically significantly higher rates of UTI (3.3% compared to 2.4%; $p < 0.0001$) (RTI, 2019c).

RTI also compared facility scores on this measure in facilities with different proportions of residents eligible for Medicaid. We examined differences in the percentage of long-stay nursing home residents with a urinary tract infection across two groups: facilities with a large proportion (greater than or equal to 75%) of residents eligible for Medicaid among facilities with sufficient sample size to meet the minimum public reporting threshold, and facilities with fewer than 75% of residents eligible for Medicaid. Facilities with a higher proportion of Medicaid-eligible residents had statistically significantly lower rates of UTI (2.7% compared to 3.7%; $p < 0.0001$) (RTI, 2019c).

Our testing of social risk factors and their relationships to UTIs indicate that some factors (Medicaid eligibility, non-Hispanic white race/ethnicity, younger age, and male sex/gender) were associated with lower UTI rates. Although associations with UTI were generally small, continued monitoring of potential disparities in UTI is critical to ensure continued utility of this measure to providers and consumers of nursing home care.

Performance Over Time:

For comparison over time, we also present facility scores on this measure in facilities with different proportions of non-White residents for Quarter 2, 2013 (last presented to NQF during endorsement maintenance), and found results similar to 2018 data. Again, we examined differences in the percentage of long-stay nursing home residents with a UTI across two groups: facilities with proportions of White residents that were greater than or equal to the median proportion (87.0%) among facilities with sufficient sample size to meet minimum public reporting requirements (≥ 30 episodes in the denominator), and facilities with fewer White residents than the median. Facilities with a higher proportion of White residents had statistically significantly higher rates of urinary tract infection (6.9% compared to 5.0%; $p < 0.0001$).

Additional analysis previously presented to NQF also examined facility measure performance in facilities stratified by the proportion of residents who are Medicaid eligible. Specifically, facilities were stratified into two groups: facilities with a large proportion (greater than or equal to 75%) of residents who are Medicaid eligible among facilities that meet the minimum denominator threshold for public reporting, and those that had less than 75 percent of residents who were Medicaid eligible. Facilities with a higher proportion of Medicaid-eligible residents had statistically significantly lower rates of UTI (6.0% compared to 7.1%; $p < 0.0001$) (RTI, 2013).

1. RTI, 2019a. Results from Testing Attachment. RTI analysis of MDS 3.0 Data, Q3, 2018 (programming reference: KH42/hf11_request_684_31_32.log, hf19_request_31_32.log, hf/hf20/hf20_request_31_32.log).
2. RTI, 2019b. RTI analysis of MDS 3.0 Data, Q3, 2018 (programming reference: kh29_47/hf365_request_q3132_684.log)
3. RTI, 2019c. RTI analysis of MDS 3.0 Data, Q3, 2018 (programming reference: kh29_47/hf387_request_q3132_684.log)
4. RTI, 2013. RTI analysis of MDS 3.0 Data, Q2, 2013 (programming reference: qm_quarter_11_12/complete/ae_request1_018.log)

1b.5. If no or limited data on disparities from the measure as specified is reported in 1b.4, then provide a summary of data from the literature that addresses disparities in care on the specific focus of measurement. Include citations. Not necessary if performance data provided in 1b.4

This is not applicable. Data are available and described in 1b.4.

2. Reliability and Validity—Scientific Acceptability of Measure Properties

Extent to which the measure, as specified, produces consistent (reliable) and credible (valid) results about the quality of care when implemented. **Measures must be judged to meet the sub criteria for both reliability and validity to pass this criterion and be evaluated against the remaining criteria.**

2a.1. Specifications The measure is well defined and precisely specified so it can be implemented consistently within and across organizations and allows for comparability. eMeasures should be specified in the Health Quality Measures Format (HQMF) and the Quality Data Model (QDM).

De.5. Subject/Topic Area (check all the areas that apply):

Infectious Diseases (ID), Renal

De.6. Non-Condition Specific(check all the areas that apply):

De.7. Target Population Category (Check all the populations for which the measure is specified and tested if any):

Elderly, Populations at Risk, Populations at Risk : Individuals with multiple chronic conditions

S.1. Measure-specific Web Page (Provide a URL link to a web page specific for this measure that contains current detailed specifications including code lists, risk model details, and supplemental materials. Do not enter a URL linking to a home page or to general information.)

<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 Manuals” zipped folder in the Downloads section at the bottom of the page.

S.2a. If this is an eMeasure, HQMF specifications must be attached. Attach the zipped output from the eMeasure authoring tool (MAT) - if the MAT was not used, contact staff. (Use the specification fields in this online form for the plain-language description of the specifications)

This is not an eMeasure Attachment:

S.2b. Data Dictionary, Code Table, or Value Sets (and risk model codes and coefficients when applicable) must be attached. (Excel or csv file in the suggested format preferred - if not, contact staff)

No data dictionary Attachment:

S.2c. Is this an instrument-based measure (i.e., data collected via instruments, surveys, tools, questionnaires, scales, etc.)? Attach copy of instrument if available.

No, this is not an instrument-based measure Attachment:

S.2d. Is this an instrument-based measure (i.e., data collected via instruments, surveys, tools, questionnaires, scales, etc.)? Attach copy of instrument if available.

Not an instrument-based measure

S.3.1. For maintenance of endorsement: Are there changes to the specifications since the last updates/submission. If yes, update the specifications for S1-2 and S4-22 and explain reasons for the changes in S3.2.

No

S.3.2. For maintenance of endorsement, please briefly describe any important changes to the measure specifications since last measure update and explain the reasons.

No changes have been made to the measure specifications since the last submission.

S.4. Numerator Statement (Brief, narrative description of the measure focus or what is being measured about the target population, i.e., cases from the target population with the target process, condition, event, or outcome) DO NOT include the rationale for the

measure.

IF an OUTCOME MEASURE, state the outcome being measured. Calculation of the risk-adjusted outcome should be described in the calculation algorithm (S.14).

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.

S.5. Numerator Details *(All information required to identify and calculate the cases from the target population with the target process, condition, event, or outcome such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b)*

IF an OUTCOME MEASURE, describe how the observed outcome is identified/counted. Calculation of the risk-adjusted outcome should be described in the calculation algorithm (S.14).

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.

S.6. Denominator Statement *(Brief, narrative description of the target population being measured)*

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.

S.7. Denominator Details *(All information required to identify and calculate the target population/denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b.)*

IF an OUTCOME MEASURE, describe how the target population is identified. Calculation of the risk-adjusted outcome should be described in the calculation algorithm (S.14).

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.

S.8. Denominator Exclusions *(Brief narrative description of exclusions from the target population)*

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.

S.9. Denominator Exclusion Details (All information required to identify and calculate exclusions from the denominator such as definitions, time period for data collection, specific data collection items/responses, code/value sets – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format at S.2b.)

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.

S.10. Stratification Information (Provide all information required to stratify the measure results, if necessary, including the stratification variables, definitions, specific data collection items/responses, code/value sets, and the risk-model covariates and coefficients for the clinically-adjusted version of the measure when appropriate – Note: lists of individual codes with descriptors that exceed 1 page should be provided in an Excel or csv file in required format with at S.2b.)

This is not applicable; this measure is not stratified.

S.11. Risk Adjustment Type (Select type. Provide specifications for risk stratification in measure testing attachment)

No risk adjustment or risk stratification

If other:

S.12. Type of score:

Rate/proportion

If other:

S.13. Interpretation of Score (Classifies interpretation of score according to whether better quality is associated with a higher score, a lower score, a score falling within a defined interval, or a passing score)

Better quality = Lower score

S.14. Calculation Algorithm/Measure Logic (Diagram or describe the calculation of the measure score as an ordered sequence of steps including identifying the target population; exclusions; cases meeting the target process, condition, event, or outcome; time period for data, aggregating data; risk adjustment; etc.)

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.

S.15. Sampling (If measure is based on a sample, provide instructions for obtaining the sample and guidance on minimum sample size.)

If an instrument-based performance measure (e.g., PRO-PM), identify whether (and how) proxy responses are allowed.

This is not applicable. The data are not estimated based on samples; rather, the data include all nursing home residents nationally who do not meet exclusion criteria.

S.16. Survey/Patient-reported data (If measure is based on a survey or instrument, provide instructions for data collection and guidance on minimum response rate.)

Specify calculation of response rates to be reported with performance measure results.

This is not applicable; this measure is not based on survey/patient-reported data.

S.17. Data Source (Check ONLY the sources for which the measure is SPECIFIED AND TESTED).

If other, please describe in S.18.

Assessment Data

S.18. Data Source or Collection Instrument (Identify the specific data source/data collection instrument (e.g. name of database, clinical registry, collection instrument, etc., and describe how data are collected.)

If instrument-based, identify the specific instrument(s) and standard methods, modes, and languages of administration.

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>.

S.19. Data Source or Collection Instrument (available at measure-specific Web page URL identified in S.1 OR in attached appendix at A.1)

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

S.20. Level of Analysis (Check ONLY the levels of analysis for which the measure is SPECIFIED AND TESTED)

Facility

S.21. Care Setting (Check ONLY the settings for which the measure is SPECIFIED AND TESTED)

Post-Acute Care

If other:

S.22. COMPOSITE Performance Measure - Additional Specifications (Use this section as needed for aggregation and weighting rules, or calculation of individual performance measures if not individually endorsed.)

This is not applicable; this is not a composite performance measure.

2. Validity – See attached Measure Testing Submission Form

[NQF_MeasSubm_MeasTesting_Formv6.5_0684_UTI_01.17.2014final.docx](#), [NQF_0684_UTI_Testing_Form_07242019_final.docx](#)

2.1 For maintenance of endorsement

Reliability testing: If testing of reliability of the measure score was not presented in prior submission(s), has reliability testing of the measure score been conducted? If yes, please provide results in the Testing attachment. Please use the most current version of the testing attachment (v7.1). Include information on all testing conducted (prior testing as well as any new testing); use red font to indicate updated testing.

Yes

2.2 For maintenance of endorsement

Has additional empirical validity testing of the measure score been conducted? If yes, please provide results in the Testing attachment. Please use the most current version of the testing attachment (v7.1). Include information on all testing conducted (prior testing as well as any new testing); use red font to indicate updated testing.

Yes

2.3 For maintenance of endorsement

Risk adjustment: For outcome, resource use, cost, and some process measures, risk-adjustment that includes social risk factors is not prohibited at present. Please update sections 1.8, 2a2, 2b1, 2b4.3 and 2b5 in the Testing attachment and S.140 and S.11 in the online submission form. NOTE: These sections must be updated even if social risk factors are not included in the risk-adjustment strategy. You MUST use the most current version of the Testing Attachment (v7.1) -- older versions of the form will not have all required questions.

Yes - Updated information is included

3. Feasibility

Extent to which the specifications including measure logic, require data that are readily available or could be captured without undue burden and can be implemented for performance measurement.

3a. Byproduct of Care Processes

For clinical measures, the required data elements are routinely generated and used during care delivery (e.g., blood pressure, lab test, diagnosis, medication order).

3a.1. Data Elements Generated as Byproduct of Care Processes.

Generated or collected by and used by healthcare personnel during the provision of care (e.g., blood pressure, lab value, diagnosis, depression score)

If other:

3b. Electronic Sources

The required data elements are available in electronic health records or other electronic sources. If the required data are not in electronic health records or existing electronic sources, a credible, near-term path to electronic collection is specified.

3b.1. To what extent are the specified data elements available electronically in defined fields (i.e., data elements that are needed to compute the performance measure score are in defined, computer-readable fields) Update this field for maintenance of endorsement.

ALL data elements are in defined fields in electronic clinical data (e.g., clinical registry, nursing home MDS, home health OASIS)

3b.2. If ALL the data elements needed to compute the performance measure score are not from electronic sources, specify a credible, near-term path to electronic capture, OR provide a rationale for using other than electronic sources. For maintenance of endorsement, if this measure is not an eMeasure (eCQM), please describe any efforts to develop an eMeasure (eCQM).

This is not applicable; all data elements used to calculate the measure are in defined fields in electronic clinical data. There are no current efforts to develop this measure as an eMeasure.

3b.3. If this is an eMeasure, provide a summary of the feasibility assessment in an attached file or make available at a measure-specific URL. Please also complete and attach the NQF Feasibility Score Card.

Attachment:

3c. Data Collection Strategy

Demonstration that the data collection strategy (e.g., source, timing, frequency, sampling, patient confidentiality, costs associated with fees/licensing of proprietary measures) can be implemented (e.g., already in operational use, or testing demonstrates that it is ready to put into operational use). For eMeasures, a feasibility assessment addresses the data elements and measure logic and demonstrates the eMeasure can be implemented or feasibility concerns can be adequately addressed.

3c.1. Required for maintenance of endorsement. Describe difficulties (as a result of testing and/or operational use of the measure) regarding data collection, availability of data, missing data, timing and frequency of data collection, sampling, patient confidentiality, time and cost of data collection, other feasibility/implementation issues.

IF instrument-based, consider implications for both individuals providing data (patients, service recipients, respondents) and those whose performance is being measured.

The general data collection method for the MDS 3.0 is currently operational and mandatory for all Medicare/Medicaid certified nursing facilities; no issues are anticipated.

CMS provides coding directions for the UTI data element in the MDS 3.0 via the RAI Manual and other mediums, such as this YouTube video (<https://www.youtube.com/watch?v=sZLjMntcPQ>) explaining the MDS 3.0 coding of Section I.

3c.2. Describe any fees, licensing, or other requirements to use any aspect of the measure as specified (e.g., value/code set, risk model, programming code, algorithm).

Not applicable

4. Usability and Use

Extent to which potential audiences (e.g., consumers, purchasers, providers, policy makers) are using or could use performance results for both accountability and performance improvement to achieve the goal of high-quality, efficient healthcare for individuals

or populations.

4a. Accountability and Transparency

Performance results are used in at least one accountability application within three years after initial endorsement and are publicly reported within six years after initial endorsement (or the data on performance results are available). If not in use at the time of initial endorsement, then a credible plan for implementation within the specified timeframes is provided.

4.1. Current and Planned Use

NQF-endorsed measures are expected to be used in at least one accountability application within 3 years and publicly reported within 6 years of initial endorsement in addition to performance improvement.

Specific Plan for Use	Current Use (for current use provide URL)

4a1.1 For each CURRENT use, checked above (update for maintenance of endorsement), provide:

- Name of program and sponsor
- Purpose
- Geographic area and number and percentage of accountable entities and patients included
- Level of measurement and setting

Public Reporting:

? Program and sponsor: Nursing Home Compare/CMS

? Purpose: Consumer information

? Geographic area and number and percentages of accountable entities and patients included: All United States

Medicare/Medicaid certified nursing homes with eligible long-stay residents. In Quarter 3, 2018, there were 15,299 eligible facilities containing 1,104,673 residents eligible for inclusion in the measure (with both prior and target assessments); 14,520 facilities (95.0%) containing 1,096,778 residents (99.3%) had sufficient sample size (20 or more long-stay residents included in the denominator) to report on this measure.

Quality Improvement with Benchmarking (external benchmarking to multiple organizations):

? Program and sponsor: CASPER /CMS

? Purpose: Quality improvement

? Geographic area and number and percentages of accountable entities and patients included: All United States

Medicare/Medicaid certified nursing homes with eligible long-stay residents. In Quarter 3, 2018, there were 15,299 eligible facilities containing 1,104,673 residents eligible for inclusion in the measure.

Quality Improvement (Internal to the specific organization):

? Program and sponsor: CASPER /CMS

? Purpose: Quality improvement

? Geographic area and number and percentages of accountable entities and patients included: All United States

Medicare/Medicaid certified nursing homes with eligible long-stay residents. In Quarter 3, 2018, there were 15,299 eligible facilities containing 1,104,673 residents eligible for inclusion in the measure.

4a1.2. If not currently publicly reported OR used in at least one other accountability application (e.g., payment program, certification, licensing) what are the reasons? (e.g., Do policies or actions of the developer/steward or accountable entities restrict access to performance results or impede implementation?)

This is not applicable; this measure is publicly reported.

4a1.3. If not currently publicly reported OR used in at least one other accountability application, provide a credible plan for implementation within the expected timeframes -- any accountability application within 3 years and publicly reported within 6 years of initial endorsement. (Credible plan includes the specific program, purpose, intended audience, and timeline for implementing the measure within the specified timeframes. A plan for accountability applications addresses mechanisms for data aggregation and reporting.)

This is not applicable; this measure is publicly reported.

4a2.1.1. Describe how performance results, data, and assistance with interpretation have been provided to those being

measured or other users during development or implementation.

How many and which types of measured entities and/or others were included? If only a sample of measured entities were included, describe the full population and how the sample was selected.

This quality measure (NQF #0684, Percent of Residents With a Urinary Tract Infection (Long Stay)) is part of the Nursing Home Quality Initiative (NHQI). Information on this measure is available to both nursing home providers and to the public.

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. These CASPER MDS 3.0 Quality Measure (QM) reports are intended to provide nursing home providers with feedback on their quality measure scores, helping them to improve the quality of care delivered. CASPER MDS 3.0 reports also include Resident-Level Quality Measure Reports, which allow providers to identify the residents that trigger a particular quality measure (by scanning a column of interest and looking for the residents with an "X") and to identify residents who trigger multiple quality measures. Providers can use this information to target residents for quality improvement activities. Quality measure reports are also available to state surveyors and facility staff through the CASPER reporting system.

Consumers, including current and prospective nursing home residents and their families/caregivers, may access nursing home scores on this quality measure via the Nursing Home Compare website (<https://www.medicare.gov/NursingHomeCompare/About/nhcinformation.html>).

CMS also publishes composite quality ratings on Nursing Home Compare via the Five-Star Rating System.

Further, providers have an opportunity to review their performance prior to public reporting on the Nursing Home Compare website via Provider Preview Reports, also available through the CASPER system. These reports allow providers to view their quality measure scores for each NHQI measure, along with state and national averages for comparison, and their Five Star Ratings.

4a2.1.2. Describe the process(es) involved, including when/how often results were provided, what data were provided, what educational/explanatory efforts were made, etc.

The CASPER reports are available to providers on-demand with quality measure data updated monthly. Nursing Home Compare reports the rolling average of four quarters for the quality measure, comparing each nursing home's score to both the state and national average; providers can preview this information before it is publicly reported.

Detailed instructions on how to view and interpret reports, including an explanation of differences between the QM reports and publicly reported information, are provided in the CASPER Reporting MDS Provider Users Guide, Section 11.

CMS provides technical users' guides (<https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/CertificationandCompliance/Downloads/usersguide.pdf>) on how the quality measures are used in the Five Star Rating System, as well as a Help Line, which is accessible by telephone and email, to answer provider questions about the NHQI quality measures and reporting requirements.

4a2.2.1. Summarize the feedback on measure performance and implementation from the measured entities and others described in 4d.1.

Describe how feedback was obtained.

CMS is committed to receiving ongoing feedback on measures implemented as part of the NHQI. CMS takes into consideration feedback and input on measure performance and implementation through the appropriate sub-regulatory communication channels, including but not limited to: NQF public comment periods held as part of endorsement processes; feedback from providers on the Nursing Home Compare Help Desk and feedback from the provider community on Open Door Forums (ODFs).

To ensure the continued value and efficacy of the measure, RTI convened a Technical Expert Panel (TEP) to obtain input from providers, residents, and caregivers on the importance, validity, and use of two nursing home quality measures: (1) Percent of Residents with a Urinary Tract Infection (Long Stay) (NQF #0684); and (2) Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long Stay) (NQF #0686). The following paragraph outlines how TEP members were recruited and supporting documentation they received to facilitate discussion during the web-based TEP meeting.

On February 12, 2019, RTI posted a Call for TEP Nominations and a TEP Nomination Form on the CMS website to initiate recruitment of TEP members. At the close of the nomination period, RTI finalized the TEP composition by selecting 11 nominees who offered a diverse range of experience, including genitourinary health and care in older adults and nursing homes, consumer perspectives,

health care disparities, performance measurement, quality improvement, and purchaser perspective. Before the TEP meeting, the TEP members received materials to review and complete to prepare for the discussion. Included in these materials was a pre-TEP survey and supplementary materials to assess the TEP members' initial thoughts on the two measures. The pre-TEP survey asked for TEP members' input on focus areas, including the importance, validity, and current use of the two measures. Responses from all TEP members were received before the TEP meeting. De-identified feedback from the TEP members was used to inform discussion topics for the TEP meeting held on May 23, 2019.

RTI International. (2019, June). Technical Expert Panel Summary Report: Maintenance of Nursing Home Quality Measures. Prepared under CMS Contract No. HHSM-500-2013-13015I. Available at <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/TEP-Current-Panels.html>.

4a2.2.2. Summarize the feedback obtained from those being measured.

In a pre-TEP survey, TEP members were asked to rate the importance of this quality measure on a scale from 1-5 (higher scores are better) based on the following criteria: is an established priority area (National Quality Strategy); addresses a demonstrated high-impact aspect of health care (e.g., affects large numbers); has external evidence of importance, such as consensus standards; and has evidence of disparities for the quality domain. 6 out of 10 TEP members rated this measure as "very important" (rating it a 4 or 5), noting that it is a critical health outcome and that this quality measure promotes accurate diagnosis and tracking of UTIs as well as the appropriate use of antibiotics.

A majority of TEP members also noted that they use this QM to track facility performance and address concerns, including reviewing residents that trigger the QM, ensuring proper documentation, evaluating staff understanding of instructions in the Long-Term Care Facility Resident Assessment Instrument 3.0 User's Manual, addressing clinical practices, and comparing their facility to state and national benchmarks. In particular, with respect to the consumer perspective, one TEP member stated that this QM "provide[s] good information for follow up questions to [the] facility."

RTI also sought input on the measure's validity (i.e., that the measure "produces credible (valid) results about the quality of care when implemented"), including feedback on potential measure modifications and recent (October 2017) changes in UTI coding guidelines in the Long-Term Care Facility Resident Assessment Instrument 3.0 User's Manual. One TEP member suggested that mobility limitations be considered as a potential risk adjuster because "The increased pooling of urine/urinary stasis, the higher level at which the urethra sits in the prone patient, and the weaker extruder muscles that can lead to incomplete emptying all may increase risk of UTI in the immobile patient." Based on this suggestion, RTI conducted testing of several MDS data elements assessing function. Results (presented in 2b3.3a. in the Testing Attachment) demonstrated that there were not strong relationships between measure performance and functional data elements. Therefore, we did not proceed with further risk adjustment testing.

Most TEP members (8 out of 10) reported no evidence or rationale for modifying the measure specifications to include exclusion criteria or to use a statistical risk model or stratification to adjust for resident social or clinical risk factors. TEP members noted that risk adjustment could mask important disparities, rather than help providers and consumers better assess facility performance.

A minority of TEP members questioned whether the UTI measure reflected quality of care in nursing homes and whether it could be used for improvement. They were concerned that nursing home staff may not apply evidence-based criteria to diagnose UTIs as intended and that some residents may develop UTIs despite a nursing home's best efforts to prevent them. However, other TEP members countered this argument, noting that the quality measure "allows for better accountability on the part of those diagnosing UTIs" (RTI, 2019).

National Quality Forum. (2019). Measure evaluation criteria. Retrieved from http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx

RTI International. (2019, June). Technical Expert Panel Summary Report: Maintenance of Nursing Home Quality Measures. Prepared under CMS Contract No. HHSM-500-2013-13015I. Available at <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/TEP-Current-Panels.html>.

4a2.2.3. Summarize the feedback obtained from other users

This is not applicable; additional feedback was not received from other users.

4a2.3. Describe how the feedback described in 4a2.2.1 has been considered when developing or revising the measure specifications or implementation, including whether the measure was modified and why or why not.

Feedback described in 4a2.2.2. demonstrates that TEP members reviewed the measure favorably with respect to importance, usability and use, and validity. Additional empirical testing (provided in the Testing Attachment) conducted based on TEP feedback did not provide strong evidence to support measure modification. Based on our synthesis of the literature, our empirical testing, and TEP feedback, we contend that changes to the specifications or use of this measure are not warranted at this time. We will continue to monitor stakeholder feedback and conduct environmental scans to support comprehensive review and evaluation of the measure. CMS will continue to take all feedback into account for future measure refinement.

Improvement

Progress toward achieving the goal of high-quality, efficient healthcare for individuals or populations is demonstrated. If not in use for performance improvement at the time of initial endorsement, then a credible rationale describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

4b1. Refer to data provided in 1b but do not repeat here. Discuss any progress on improvement (trends in performance results, number and percentage of people receiving high-quality healthcare; Geographic area and number and percentage of accountable entities and patients included.)

If no improvement was demonstrated, what are the reasons? If not in use for performance improvement at the time of initial endorsement, provide a credible rationale that describes how the performance results could be used to further the goal of high-quality, efficient healthcare for individuals or populations.

Progress (trends in performance results, number and percentage of people receiving high-quality healthcare):

National facility-level mean and median scores for all available quarters (i.e., Quarter 1, 2011, to Quarter 3, 2018) are presented in the response to 2b1.3. in the Testing Attachment. After an early increase in mean and median scores, the national facility-level mean and median scores have trended steadily downward since the implementation of the MDS 3.0 measure, indicating a general improvement in performance over time. The mean score for this measure was 7.5% in Quarter 1, 2011, and the median score was 6.5%. In Quarter 3, 2018, the mean and median scores were 2.8% and 1.9%, respectively.

Geographic area and number and percentages of accountable entities and patients included:

All United States Medicare/Medicaid certified nursing homes with eligible long-stay residents. In Quarter 3, 2018, there were 15,299 eligible facilities containing 1,104,673 residents eligible for inclusion in the measure (with both prior and target assessments); 14,520 facilities (95.0%) containing 1,096,778 residents (99.3%) had sufficient sample size (20 or more long-stay residents included in the denominator) to report on this measure.

SOURCE: RTI analysis of MDS 3.0 episode files for Quarter 1, 2011–Quarter 3, 2018 (programming reference: KH46\hf15_request_684_31_32.log)

4b2. Unintended Consequences

The benefits of the performance measure in facilitating progress toward achieving high-quality, efficient healthcare for individuals or populations outweigh evidence of unintended negative consequences to individuals or populations (if such evidence exists).

4b2.1. Please explain any unexpected findings (positive or negative) during implementation of this measure including unintended impacts on patients.

The implementation of the MDS 3.0 version of the long-stay UTI measure demonstrated an improvement over the MDS 2.0 version of the same measure because it addressed potential causes of error by requiring more reliable evidence of UTI (CMS, 2009; Abt, 2007; Saliba and Buchanan, 2008; Stevenson, Moore, and Sleeper, 2007). Currently, this measure is the only one in the existing measure set that addresses the critical issue of infections in nursing homes, helping to drive quality improvements in the resident safety domain.

Of note, as this QM encourages staff education and supports accurate clinical diagnosis, this can also promote accurate treatment of UTIs. For example, there are negative implications associated with the “potential overuse of antibiotics to treat asymptomatic bacteriuria” and, during a May 2019 TEP, TEP members agreed that this QM promotes appropriate antibiotic use by improving antibiotic prescribing and antibiotic stewardship (RTI, 2019).

Abt Associates, Inc.; Stepwise Systems, Inc.; Qualidigm. Data Assessment and Verification (DAVE 2) project—MDS two-stage discrepancy findings, April–December 2006. Cambridge, MA: Abt Associates, Inc, 2007.

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2009. Available at http://www.cms.hhs.gov/NursingHomeQualityInits/25_NHQIMDS30.asp#TopOfPage.

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Saliba D, Buchanan J. Development and Validation of a Revised Nursing Home Assessment Tool: MDS 3.0. Contract No. 500-00-0027/Task Order #2. Santa Monica, CA: Rand Corporation, Apr 2008. Available from <http://www.cms.hhs.gov/NursingHomeQualityInits/Downloads/MDS30FinalReport.pdf>.

Stevenson KB, Moore JW, Sleeper B. Validity of the Minimum Data Set in identifying urinary tract infections in residents of long-term care facilities. J Am Geriatr Soc. 2007;52: 707-711.

4b2.2. Please explain any unexpected benefits from implementation of this measure.

This is not applicable; there are no unexpected benefits. Positive unexpected findings, including improved antibiotic prescribing and antibiotic stewardship, are described in 4b2.1.

5. Comparison to Related or Competing Measures

If a measure meets the above criteria and there are endorsed or new related measures (either the same measure focus or the same target population) or competing measures (both the same measure focus and the same target population), the measures are compared to address harmonization and/or selection of the best measure.

5. Relation to Other NQF-endorsed Measures

Are there related measures (conceptually, either same measure focus or target population) or competing measures (conceptually both the same measure focus and same target population)? If yes, list the NQF # and title of all related and/or competing measures.
Yes

5.1a. List of related or competing measures (selected from NQF-endorsed measures)

0138 : National Healthcare Safety Network (NHSN) Catheter-associated Urinary Tract Infection (CAUTI) Outcome Measure
0281 : Urinary Tract Infection Admission Rate (PQI 12)

5.1b. If related or competing measures are not NQF endorsed please indicate measure title and steward.

Measures with Similar Focus and Similar Target Population that are Not NQF-Endorsed

- Improvement in Urinary Tract Infection (This is a measure listed on the CMS Measures Under Development list for Home Health Quality Reporting)(1)
- Development of urinary tract infection (This is a measure listed on the CMS Measures Under Development list for Home Health Quality Reporting) (1)

Measures with Similar Focus and Different Target Population that are Not NQF-Endorsed

- Urinary tract infection (UTI) admission ratea (area-level): rate per 100,000 population (AHRQ, not endorsed)

(1) Source: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/QualityMeasures/CMS-Measures-Inventory.html>

5a. Harmonization of Related Measures

The measure specifications are harmonized with related measures;

OR

The differences in specifications are justified

5a.1. If this measure conceptually addresses EITHER the same measure focus OR the same target population as NQF-endorsed measure(s):

Are the measure specifications harmonized to the extent possible?

No

5a.2. If the measure specifications are not completely harmonized, identify the differences, rationale, and impact on

interpretability and data collection burden.

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. Competing Measures

The measure is superior to competing measures (e.g., is a more valid or efficient way to measure);

OR

Multiple measures are justified.

5b.1. If this measure conceptually addresses both the same measure focus and the same target population as NQF-endorsed measure(s):

Describe why this measure is superior to competing measures (e.g., a more valid or efficient way to measure quality); OR provide a rationale for the additive value of endorsing an additional measure. (Provide analyses when possible.)

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.

Appendix

A.1 Supplemental materials may be provided in an appendix. All supplemental materials (such as data collection instrument or methodology reports) should be organized in one file with a table of contents or bookmarks. If material pertains to a specific submission form number, that should be indicated. Requested information should be provided in the submission form and required attachments. There is no guarantee that supplemental materials will be reviewed.

No appendix Attachment:

Contact Information

Co.1 Measure Steward (Intellectual Property Owner): Centers for Medicare & Medicaid Services

Co.2 Point of Contact: Helen, Dollar-Maples, Helen.Dollar-Maples@cms.hhs.gov, 410-786-7214-

Co.3 Measure Developer if different from Measure Steward: Acumen LLC

Co.4 Point of Contact: Michael, Collier, mcollier@sphereinstitute.org, 650-558-8882-1268

Additional Information

Ad.1 Workgroup/Expert Panel involved in measure development

Provide a list of sponsoring organizations and workgroup/panel members' names and organizations. Describe the members' role in measure development.

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This technical expert panel met over two days in January 2009 to review an environmental scan of the current quality measures and to make recommendations regarding their transition from MDS 2.0 to MDS 3.0 and to assess measure reliability and validity.

In addition, to ensure the continued value and efficacy of the measure, RTI convened a Technical Expert Panel (TEP) on May 23, 2019, to obtain input from providers, residents, and caregivers on the importance, validity, and use of two nursing home quality measures: (1) Percent of Residents with a Urinary Tract Infection (Long Stay) (NQF #0684); and (2) Percent of Residents Who Have/Had a Catheter Inserted and Left in Their Bladder (Long Stay) (NQF #0686). The TEP report, including TEP member biographies, is available online at <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/TEP-Current-Panels.html>.

RTI International (2009). Transition of Publicly Reported Nursing Home Measures to MDS 3.0 Draft Technical Expert Panel Report.

RTI International. (2019, June). Technical Expert Panel Summary Report: Maintenance of Nursing Home Quality Measures. Prepared under CMS Contract No. HHSM-500-2013-13015I. Available at <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/TEP-Current-Panels.html>.

Measure Developer/Steward Updates and Ongoing Maintenance

Ad.2 Year the measure was first released: 2011

Ad.3 Month and Year of most recent revision: 05, 2016

Ad.4 What is your frequency for review/update of this measure? Endorsement maintenance every 3 years; annual maintenance every year.

Ad.5 When is the next scheduled review/update for this measure? 08, 2020

Ad.6 Copyright statement: This is not applicable.

Ad.7 Disclaimers: This is not applicable.

Ad.8 Additional Information/Comments: This is not applicable. No changes have been made to the measure specifications since the last endorsement.