2024 Pre-Rulemaking Measure Review
Preliminary Assessment

MUC ID	Title
MUC2024-041	Hospital-Level, 30-Day, Risk-Standardized Readmission Rate (RSRR) Following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA)
Measure Steward & Developer	**Proposed CMS Programs**
Centers for Medicare & Medicare Services (CMS)	Hospital Readmissions Reduction Program

Measure Overview
Developer-provided rationale: The goal of this measure is to improve patient outcomes by providing patients, physicians, hospitals, and policymakers with information about hospital-level, risk-standardized readmission rates following hospitalization for primary elective THA and/or TKA procedure. Measurement of patient outcomes allows for a broad view of quality of care that encompasses more than what can be captured by individual process-of-care measures. Complex and critical aspects of care, such as communication between providers, prevention of and response to complications, patient safety, and coordinated transitions to the outpatient environment, all contribute to patient outcomes but are difficult to measure by individual process measures. The goal of outcomes measurement is to risk adjust for patient conditions at the time of hospital admission and then evaluate patient outcomes. This measure was developed to identify institutions whose performance is better or worse than would be expected based on their patient case mix and, therefore, promote hospital quality improvement and better inform consumers about care quality.
CMS-provided program rationale: CMS is considering including this quality measure into its quality reporting programs because the measure supports CMS's long-standing effort to link Medicare payments to health care quality in the inpatient hospital setting. Under the Hospital Readmissions Reduction Program (HRRP), CMS reduces payments to hospitals with higher-than-expected rates of readmission following treatment for select conditions and procedures, encouraging hospitals to provide high-quality care to reduce avoidable returns to the hospital. This re-specified, condition-specific, hospital 30-Day, all-cause, risk-standardized readmission rate quality measure is currently used successfully within HRRP. It is going through the MUC process for inclusion of Medicare Advantage (MA) beneficiaries to help ensure that within CMS quality reporting programs, quality measurement is tracked across all Medicare beneficiaries and not just the fee-for-service (FFS) population. Specifically, including MA beneficiaries will enable CMS to further its goals of improving health care for all Americans by linking payment to the quality of hospital care and advancing health equity. Over the past decade, enrollment in MA plans has more than doubled with over half of Medicare beneficiaries enrolling in MA plans. The continued inclusion of the quality measures with both

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Measure Overview
FFS and MA beneficiaries in HRRP will help the agency move closer to achieving its strategic quality initiatives of improving quality and health outcomes across the care journey and enabling a responsive and resilient health care system to improve quality.
Description: The measure estimates a hospital-level risk-standardized readmission rate (RSRR) following elective primary THA and/or TKA in Medicare Fee-For-Service (FFS) and/or Medicare Advantage (MA) beneficiaries who are 65 years and older. The outcome (readmission) is defined as unplanned readmission for any cause within 30 days of the discharge date for the index admission (the admission included in the measure cohort). A specified set of planned readmissions do not count in the readmission outcome.
Measure background: Measure currently used in a Medicare program, but the measure is undergoing substantive changes.
Numerator: The outcome for this measure is 30-day, all-cause readmissions. We define readmission as an inpatient acute care admission for any cause, with the exception of certain planned readmissions, within 30 days from the date of discharge from the index admission for patients discharged from the hospital after an elective primary THA and/or TKA procedure. If a patient has more than one unplanned admission (for any reason) within 30 days after discharge from the index admission, only the first one is counted as a readmission. This measure looks for a dichotomous yes or no outcome of whether each admitted patient has an unplanned readmission within 30 days. However, if the first readmission after discharge is considered planned, any subsequent unplanned readmission is not counted as an outcome for that index admission because the unplanned readmission could be related to care provided during the intervening planned readmission rather than during the index admission. Readmissions with a principal diagnosis code of COVID-19 (U07.1) or with a secondary diagnosis code of COVID-19 coded as present on admission on the readmission claim are not eligible for the readmission outcome and are excluded. **Exclusions:** None
Denominator: The cohort includes admissions for patients that meet all of the following inclusion criteria: 1. Enrolled in Medicare fee-for-service (FFS) and/or Medicare Advantage (MA) for the 12 months prior to the date of admission; and enrolled in FFS or MA during the index admission; 2. Aged 65 or over; 3. Discharged alive from a non-federal short-term acute care hospital; 4. Having a qualifying elective primary THA and/or TKA procedure during the index admission. Elective primary THA/TKA procedures are defined as those THA/TKA procedures without any of the following: fracture of the pelvis or lower limbs coded in the principal or secondary discharge diagnosis fields on the index admission claim (Note: Periprosthetic fractures must be additionally coded as present on admission [POA] in order to disqualify a THA/TKA from cohort inclusion, unless exempt from POA reporting); a concurrent partial hip or knee arthroplasty procedure; a concurrent revision, resurfacing, or implanted device/prosthesis removal procedure; mechanical complication coded in the principal discharge diagnosis field on the index admission claim; malignant

Measure Overview	
neoplasm of the pelvis, sacrum, coccyx, lower limbs, or bone/bone marrow or a disseminated malignant neoplasm coded in the principal discharge diagnosis field on the index admission claim; or transfer from another acute care facility for the THA/TKA. **Exclusions:** This measure excludes index admissions for patients that meet any of the following exclusion criteria: 1. Without at least 30 days of post-discharge enrollment in Medicare FFS and/or MA; 2. Admitted for the index procedure and subsequently transferred to another acute care facility; 3. THA/TKA admissions within 30 days of discharge from a prior THA/TKA index admission; 4. Discharged against medical advice; 5. With more than two THA/TKA procedure codes during the index admission; 6. With a principal diagnosis code of COVID-19 or with a secondary diagnosis code of COVID-19 coded as POA on the index admission claim. **Exceptions:** None	
Measure type: Outcome	**Measure has multiple scores:** No **Measure is a composite:** No **Measure is digital and/or an eCQM:** No **Measure is a paired or group measure:** No
Level of analysis: Facility	**Data source(s):** Digital-Administrative systems: Administrative Data (non-claims); Digital-Administrative systems: Claims Data
Care setting(s): Hospital inpatient acute care facility	**Risk adjustment or stratification:** Yes
CBE endorsement status: Endorsed; CBE ID 1551	**CBE endorsement history:** Endorsed 2020; Initial Endorsement 2012
Is measure currently used in CMS programs? Yes, Hospital Readmissions Reduction Program	**Measure addresses statutorily required area?** No

Meaningfulness

Importance	
Type of evidence:	Peer-Reviewed Original Research; Empirical data; Grey Literature [Source MERIT Submission Form]
Importance: Evidence suggests that this measure concept is of importance to persons and entities. Although readmissions following elective THA and TKA are relatively rare, the results can be devastating. The variation in readmission rates across hospitals indicates there is room for quality improvement, and targeted efforts to reduce these readmissions that could result in better patient care and potential cost savings. During CBE Endorsement & Maintenance cycle 2020, the committee found the importance of this measure to be sufficient. Committee members should consider whether recent measure changes (see numerator, denominator and endorsement history section of this PA) affect their interpretation of this criterion	
Rating: Met, Prior CBE Endorsement.	

Measure Performance

The importance data provided (3,116 hospitals) corresponds to Table 4.6.5 in the Supplemental Methodology Report, which includes hospitals with at least 25 admissions. Because reliability has been calculated on a subset of hospitals with at least 25 admissions, Battelle used the mean and standard deviation from Table 4.6.6 ("with ICD-10-based risk variables" columns) to estimate the importance deciles (i.e., the data sorted and broken into 10 equal parts) in Table 1 below (for simplicity, a normal distribution was assumed).

Interpretation: The mean score for the 1,483 entities described in the testing submission for this measure was 4.7. For this ratio measure, a lower score indicates better quality of care.

Table 1. MUC2024-041 Performance Score Deciles

	Overall	Min	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	Max
Mean Score (SD)	4.7 (0.5)	3.1	3.9	4.2	4.4	4.5	4.6	4.8	4.9	5.0	5.2	5.5	6.3
Number of Entities	1,483	1	148	148	149	148	148	149	148	148	149	148	1

Conformance
Measure alignment with conceptual intent: The specification of the measure focus (readmission rate following elective primary THA and/or TKA) is aligned with the conceptual intent and has been used and studied extensively. The submission provides extensive data demonstrating comparability between the fee-for-service (FFS) and Medicare Advantage target populations and demonstrating minimal impact on the modified risk-adjusted rates. Numerator and denominator populations are appropriate and exclusions align with clinical evidence.
Rating: Met, Prior CBE Endorsement

Feasibility	
eCQM Feasibility testing conducted:	No [Source: MERIT Submission Form]
Feasibility: The specification for the measure focus, the target population, and the risk factors is based on fee-for-service administrative (claims) data, and the measures have been in use for over a decade. The Medicare Advantage encounter data are collected and reported in similar fashion. The submission states that all data elements are in defined fields in electronic sources and that United States Core Data for Interoperability (USCDI)/USCDI+ quality alignment has not yet been assessed; aligning with USCDI standards for data elements can promote interoperability and improve feasibility. During CBE Endorsement & Maintenance cycle 2020, the committee found the feasibility of this measure to be sufficient. Committee members should consider whether recent measure changes affect their interpretation of this criterion	
Rating: Met, Prior CBE Endorsement	

Validity	
Validity testing:	Face Validity & Empiric Validity [Sources: MERIT Submission Form; Methodology; Methodology Supplemental; Methodology TEP; Social Risk Factor Testing]
Testing level(s):	Facility

Validity: The developer assessed the face validity of the measure score as an indicator of quality by soliciting the technical expert panel (TEP) members' agreement with the following statement: "The risk-standardized readmission rate obtained from the measure as specified can be used to distinguish between better and worse quality hospitals." Eleven of 12 TEP members strongly, moderately, or somewhat agreed with the statement.

The submission also cites a relevant portion of the extensive published literature that substantiates the association (correlation) and mechanism (interventions, strategies) claims of causation between the entity response (the quality construct) and the measure focus.

The correlation between the THA/TKA readmission measure and the Star Rating Standardized Readmission Group Scores (excluding THA/TKA readmissions), the Star Rating Standardized Summary Scores (excluding THA/TKA readmissions) and the Star Rating Standardized Summary Scores (excluding readmission measure group) was -0.13, -0.13 and –0.09, respectively. This is in the hypothesized direction because lower THA/TKA readmission rate and higher Star Rating reflect better quality of care.

During CBE Endorsement & Maintenance cycle 2020, the committee found the validity of this measure to be sufficient. Committee members should consider whether recent measure changes affect their interpretation of this criterion.

Threats to validity: Limitation: a threat to validity is the 2- or 3-year period of performance used to increase reliability but with a trade-off to validity (since historical data may not reflect current performance).

During prior CBE Endorsement & Maintenance cycle, the committee found validity of this measure sufficient. Committee members should consider whether recent measure changes (see numerator, denominator and endorsement history section of this PA) affect their interpretation of this criterion.

Rating: Met, Prior CBE Endorsement

Reliability	
Reliability testing method(s):	Signal-to-noise [Sources: MERIT Submission Form; Methodology; Methodology Supplemental; Methodology TEP; Social Risk Factor Testing]
Testing level:	Facility

Reliability discussion: The numerator and denominator for this measure are well defined. The developer calculated signal-to-noise reliability based on the between entity variance from the risk-adjustment model. This results in the reliability of the hospital intercepts from the risk-adjusted model, but not the reliability of the final measure, the risk-standardized readmission rate (RSRR) or the reliability of the standardized readmission ratio (SRR). The analysis to determine if a hospital performs better or worse than expected (calculated using bootstrapping procedures) indicates that the measure is ineffective at differentiating entities by quality of performance. Of the 1,828 hospitals with at least 25 admissions, 29 (1.6%) performed better than the national rate, five (0.3%) performed worse than the national rate, and 98.1% performed no different than the national rate.

The reliability results provided (which represent the reliability of the predicted value only) were calculated from 1 year of data consisting of 2,032 hospitals with at least 25 admissions. The developer projected the reliability for 2- and 3-year data and provided estimated minimum, maximum, median, and 25th and 75th percentiles. Battelle interpolated these estimates to estimate deciles of reliability (Table 2).

For the 2-year projections, about 55% of the entities would have a reliability >0.6, indicating that about 45% of entities may not be able to distinguish good from poor quality care. For the 3-year projections, about 65% of the entities would have a reliability >0.6, indicating that about 35% of entities may not be able to distinguish good from poor quality care.
This suggests slightly improved reliability of the measure with a longer period of performance and resulting larger sample size.

During CBE Endorsement & Maintenance cycle 2020, the committee found the reliability of this measure to be sufficient. Committee members should consider whether recent measure changes affect their interpretation of this criterion.

Additional reliability analyses: The importance data provided (3,116 hospitals) corresponds to Table 4.6.5 in the Supplemental Methodology Report, which includes hospitals with <25 admissions. Because reliability has been calculated on hospitals with at least 25 admissions, Battelle used the mean and standard deviation from Table 4.6.6 ("with ICD-10-based risk variables" columns) to estimate the importance deciles. Table 2 includes the minimum, maximum, and 25th and 75th percentiles provided. Deciles have been filled in with simple interpolation.

Rating: Met, Prior CBE Endorsement

Reliability Table

Table 2 shows deciles by reliability based on the information provided for the performance score (Table 4.6.6 in the Supplemental Methodology Report) and calculated reliability for the 2,032 entities described in the testing submission. Battelle created this table to provide reviewers with a standardized format to assess reliability.

Interpretation: For the 2-year projections, about 55% of the entities would have a reliability >0.6, indicating that about 45% of entities may not be able to distinguish good from poor quality care. For the 3-year projections, about 65% of the entities would have a reliability >0.6, indicating that about 35% of entities may not be able to distinguish good from poor quality care.

Table 2. MUC2024-041 Mean Reliability (by Reliability Decile)

	Mean	SD	Min	Decile 1	Decile 2	Decile 3	Decile 4	Decile 5	Decile 6	Decile 7	Decile 8	Decile 9	Decile 10	Max	IQR
2-year	0.65	0.21	0.361	0.39	0.45	0.51	0.53	0.59	0.68	0.74	0.79	0.83	0.91	0.994	0.29
3-year	0.71	0.21	0.370	0.41	0.48	0.55	0.58	0.65	0.73	0.79	0.84	0.87	0.93	0.996	0.29

Usability	
Usability considered in application:	Yes
Usability discussion: The measure counts readmissions to any acute care hospital for any cause within 30 days of the date of discharge of the index THA and/or TKA hospitalization, excluding planned readmissions as defined below. The addition of MA data to the measure doubles the cohort size, improves measure reliability, and more accurately reflects the quality of care for both FFS and MA beneficiaries. One limitation is that the submission does not explicitly consider barriers or facilitators to the implementation of strategies to reduce readmissions or how those barriers might be mitigated or facilitators disseminated. The committee should consider if the “flattened” rates in importance table may suggest that further improvement in the rates may require an alternative approach and strategy. During CBE Endorsement & Maintenance cycle 2020, the committee found the use & usability of this measure to be sufficient. Committee members should consider whether recent measure changes (see numerator, denominator and endorsement history section of this PA) affect their interpretation of this criterion.	
Rating: Met, Prior CBE Endorsement	

External Validity	
Was this measure tested in the same target population as the CMS program?	Yes
External validity discussion: In general, the developer tested the measure on the target population (Medicare fee-for-service and Medicare Advantage beneficiaries). Limitation: Only one year of data (January 1, 2022, to December 30, 2022) was available for testing. Reliability testing extrapolated 1 year of data to 2 or 3 years, assuming the same signal variance and reducing the noise variance by using a larger denominator. Presumably, future testing would include additional years of data.	
Rating: Met, Prior CBE Endorsement	

Appropriateness of Scale

Similar or related measures in program(s):	From the submission: This measure is distinct from 00350-02-C-HIQR Hospital-Level Risk-Standardized Complication Rate (RSCR) because the rate of readmission and rate of complications may be different. As an example, if a patient experiences a minor complication, there may not be a need for readmission.
Measure appropriateness, equity, and value across target populations/measured entities: The submission does not specifically address how benefits and harms of the measure use are distributed across identifiable subpopulations of either persons or entities. While there might be differences among entities in terms of community support and access to care services, this measure is stratified by the proportion of dual-eligibility (DE) patients as part of the CMS HRRP calculations. The committee should consider whether entities that operate in areas with fewer community supports and have access to post-acute care services are able to realize the same benefits from those readmission-reduction strategies.	

Time to Value Realization

Plan for near- and long-term impacts after implementation:	The submission does not specifically address how any benefits or harms of measure use might change over time.

Measure implementation impacts over time: While the measure developer briefly mentions potential outcomes for their measure on patient populations, there may be a need for further examination of near- and long-term impacts of this measure after implementation for measured entities and patients.

Questions for the committee to consider:

- What are the potential near- and long-term impacts of this measure on measured entities, proposed CMS program, and patient populations?
- Will benefits and burdens associated with this measure be realized within an appropriate implementation time frame?
- How will this measure mature through revisions in the future if added to proposed CMS program?
- Given that the measure has been in use, what rationale exists for expectations of continued measure improvement?