NQF-ENDORSED VOLUNTARY CONSENSUS STANDARD FOR HOSPITAL CARE

Measure Information Form
Collected For: CMS Outcome Measures (Claims Based)

Measure Set: CMS Readmission Measures

Set Measure ID #: READM-30-THA/TKA

Performance Measure Name: Hospital-level 30-day all-cause risk-standardized readmission rate (RSRR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA).

Description: This hospital-level risk-standardized readmission measure for patients undergoing elective primary THA and/or TKA identifies "index" admissions for inclusion in the measure using Medicare Part A inpatient claims for fee-for-service (FFS) Medicare beneficiaries hospitalized. An "index" admission is any eligible admission to an acute care hospital for an elective primary THA and/or TKA included in the measure. The date of discharge of the index hospitalization is the starting point for all follow-up, and the hospital that ultimately discharges the patient to a non-acute care setting is the one held accountable for the readmission.

Rationale: THA and TKA are commonly performed procedures that improve quality of life. In 2003 there were 202,500 THAs and 402,100 TKAs performed[1] and the number of procedures performed has increased steadily over the past decade.[2,3]
Although these procedures dramatically improve quality of life, they are costly. In 2005 annual hospital charges totaled $3.95 billion and $7.42 billion for primary THA and TKA, respectively.[2] These costs are projected to increase by 340% to $17.4 billion for THA and by 450% to $40.8 billion for TKA by 2015.[2] Medicare is the single largest payer for these procedures, covering approximately two-thirds of all THAs and TKAs performed in the US.[3] Combined, THA and TKA procedures account for the largest procedural cost in the Medicare budget.[4]

Hospitals vary in their readmission rates. Analyses in Medicare fee-for-service (FFS) patients (2008-2010) demonstrate a median hospital-level RSRR of 5.7% (range 3.2% to 9.9%) after elective primary THA and/or TKA, suggesting room for improvement in clinical care. Hospital readmission is an outcome that is influenced by quality of care and is an important outcome for patients. Hospital processes that reflect the quality of inpatient and outpatient care such as discharge planning, medication reconciliation, and coordination of outpatient care have been shown to reduce readmission rates.[5]
Although readmission rates are also influenced by hospital system characteristics, such as the bed capacity of the local health care system,[6] these hospital characteristics should not influence quality of care. Therefore, this measure does not risk adjust for such hospital characteristics.

The variation in readmission rates across hospitals suggests there are considerable differences in the quality of care at the hospital level. Measuring and reporting elective primary THA/TKA readmission rates will inform health care providers about opportunities to improve care, strengthen incentives for quality improvement, and promote improvements in the quality of care received by Medicare patients and the outcomes they experience. The measure will also provide patients with information that could guide their choices regarding where they seek care for these elective procedures. Furthermore, the measure will increase transparency for consumers and has the potential to lower health care costs by reducing the risk of readmissions.

Type of Measure: Outcome

Improvement Noted As: A decrease in the RSRR.

Numerator Statement: This outcome measure does not have a traditional numerator and denominator like a core process measure (e.g., percentage of adult patients with diabetes aged 18-75 years receiving one or more hemoglobin A1c tests per year); thus, we are using this field to define our statistically-adjusted outcome measure.

The outcome for this measure is unplanned readmission within 30 days. The measure defines a readmission as an unplanned subsequent acute care hospital inpatient admission within 30 days of the discharge date of index admission. The intent is to include all readmissions except for those associated with another elective primary THA/TKA procedure or other planned procedure, which are considered planned readmissions (see below) and are excluded from the measure outcome as they are likely not adequate measures of care quality. An index admission is any eligible hospitalization to an acute care hospital assessed in the measure for the readmission outcome.

Denominator Statement: Patients eligible for inclusion in the measure are those aged 65 years and older electively admitted to non-federal acute care hospitals, as indicated by an ICD-9-CM procedure code for primary THA and/or TKA.
Eligible index admissions are identified using the following ICD-9 procedure codes in Medicare Part A inpatient claims data:

- 81.51 Total Hip Arthroplasty
- 81.54 Total Knee Arthroplasty

Included Populations: Admissions for Medicare FFS beneficiaries greater than or equal to 65 years of age discharged from non-federal acute care hospitals having a principal procedure code for an elective primary THA and/or TKA.

Excluded Populations: In order to identify a cohort of elective THA and/or TKA procedures, the measure excludes admissions for patients:

- With a femur, hip or pelvic fracture coded in the principal discharge diagnosis field for the index admission
- Undergoing partial hip arthroplasty (PHA) procedures (with a concurrent THA/TKA)
- Undergoing revision procedures (with a concurrent THA/TKA)

- Undergoing resurfacing procedures (with a concurrent THA/TKA)
- With a mechanical complication coded in the principal discharge diagnosis field for the index admission
- With a malignant neoplasm of the pelvis, sacrum, coccyx, lower limbs, or bone/bone marrow or a disseminated malignant neoplasm coded in the principal discharge diagnosis field for the index admission
- With a procedure code for removal of implanted devices / prostheses

After excluding the above admissions to select elective primary THA/TKA procedures, the measure also excludes admissions for patients:

- Without at least 12 months pre-index admission enrollment in Medicare FFS
- Without at least 30 days post-discharge enrollment in Medicare FFS
- Who were transferred in to the index hospital
- Who were admitted for the index procedure and subsequently transferred to another acute care facility
- Who leave the hospital against medical advice (AMA)
- With more than two THA/TKA procedures codes during the index hospitalization
- Who die during the index admission

Admissions not counted as readmissions ("Planned readmissions"):
Some patients are readmitted within 30 days of the index hospitalization to undergo another elective primary THA/TKA procedure. If a patient undergoes a second elective primary THA/TKA within 30 days of the discharge date for the index admission, and the admission is associated with a primary discharge diagnosis of osteoarthritis, rheumatoid arthritis, osteonecrosis, or arthropathy (excluding septic arthropathy), the readmission is considered "planned" and is not counted as a readmission in the measure.

Additionally, admissions identified as planned by the planned readmissions algorithm are not counted as readmissions. The "algorithm" is a set of criteria for classifying readmission as planned using Medicare claims. The algorithm identifies admissions that are typically planned and may occur within 30 days of discharge from the hospital. CMS based the planned readmission algorithm on three principles:

1. A few specific, limited types of care are always considered planned (obstetrical delivery, transplant surgery, maintenance chemotherapy, rehabilitation);
2. Otherwise, a planned readmission is defined as a non-acute readmission for a scheduled procedure; and
3. Admissions for acute illness or for complications of care are never planned.

The planned readmission algorithm uses a flow chart and four tables of procedures and conditions to operationalize these principles and to classify readmissions as planned. The flow chart and tables are available in a report, CMS Planned Readmission Algorithm Version 2.1 – General Population at Centers for Medicare & Medicaid Services Planned Readmission Algorithm Version 2.1: General Population report.

Risk Adjustment:
The measure follows an approach to risk adjustment that is tailored to and appropriate for a publicly reported outcome measure, as articulated in the American Heart Association (AHA) Scientific Statement, “Standards for Statistical Models Used for Public Reporting of Health Outcomes” (Krumholz et al., 2006).

The measure adjusts for case-mix differences based on the clinical status of the patient at the time of admission. Conditions that may represent adverse outcomes due to care received during the index admission are not considered for inclusion in the risk-adjustment. Although they may increase the risk of readmission, including them as covariates in the risk-adjustment could attenuate the measure’s ability to characterize the quality of care delivered by hospitals.

Full details of the development of the risk-standardization model for this measure are available at: http://www.qualitynet.org.

Data Collection Approach: Medicare claims data

Data Accuracy: The administrative claims data used to calculate the measure are maintained by CMS' Office of Information Services. These data undergo additional quality assurance checks during measure development and maintenance

Measure Analysis Suggestions: None

Sampling: No

Data Reported As: The measure estimates hospital-level 30-day all-cause RSRRs using a hierarchical logistic regression model. In brief, the approach simultaneously models two levels (patient and hospital) to account for the variance in patient outcomes within and between hospitals. The patient level models the log-odds of a hospital readmission within 30 days of discharge adjusting for age, sex, selected clinical covariates, and a hospital-specific intercept. The second level models the hospital-specific intercepts as arising from a normal distribution. The hospital-specific intercept represents the underlying risk of a readmission at that hospital, after accounting for patient risk. If there were no differences among hospitals, then after adjusting for patient risk, the hospital intercepts should be identical across all hospitals.

The RSRR is calculated as the ratio of the number of “predicted” to the number of “expected” readmissions, multiplied by the national unadjusted readmission rate. For each hospital, the numerator of the ratio is the number of readmissions within 30 days predicted on the basis of the hospital’s performance with its observed case-mix, and the denominator is the number of readmissions expected on the basis of the nation’s performance with that hospital’s case-mix. This approach is analogous to a ratio of “observed” to “expected” used in other types of statistical analyses. It conceptually allows for a comparison of a particular hospital’s performance given its case-mix to an average hospital’s performance with the same case-mix. Thus a lower ratio indicates lower-than-expected readmission or better quality and a higher ratio indicates higher-than-expected readmission or worse quality.

After regressing the risk factors and the hospital specific intercept on the risk of readmission, the predicted number of readmissions within 30 days (the numerator) is calculated by summing the estimated regression coefficients multiplied by the patient characteristics, adding the estimated hospital-specific intercept, transforming this value to the probability scale, and then summing over all patients attributed to the hospital to get the predicted value. The expected number of readmissions within 30 days (the denominator) is obtained by summing the estimated regression coefficients multiplied by the patient characteristics observed in the hospital, adding the estimated average hospital intercept, transforming to the probability scale and then summing over all patients in the hospital to get the expected value.

Selected References:

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