

Measure Information for the Risk-standardized Complication Rate (RSCR) Following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) for Merit-based Incentive Payment System (MIPS)

Performance Year (PY) 2024 THA/TKA Complication Measure Code Specifications

January 1 – December 31, 2024

A. Measure Name

Risk-standardized Complication Rate (RSCR) following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) for Merit-based Incentive Payment System (MIPS).

B. Measure Description

The Risk-standardized Complication Rate (RSCR) following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) for the Merit-based Incentive Payment System (MIPS) measure is a risk-standardized complication rate for Medicare Fee-for-Service (FFS) beneficiaries aged 65 or older who experienced complications after an inpatient elective primary THA and/or TKA procedure, defined as complications occurring from the date of index admission to 90 days post discharge. The measure attributes complications to MIPS participating clinicians and/or clinician groups, as identified by their National Provider Identifiers (NPIs) and Taxpayer Information Numbers (TINs) and assesses each clinician's or clinician group's complication rate.



C. Rationale

THAs and TKAs are commonly performed and costly procedures. Complications increase costs associated with THA and TKA and affect the quality, and potentially quantity, of life for patients. Although complications following elective primary THA and TKA are rare, the results can be devastating. CMS is applying this measure to MIPS because preventing complications of care following THA and TKAs reduces costs and promotes high-quality care.

D. Measure Outcome (Numerator)

The outcome for this measure is any of the specified complications occurring during the index admission (not coded present on arrival) and up to 90 days post-date of the index admission for elective primary THA and/or TKA procedures.

The measure assesses a dichotomous yes or no outcome of whether each admitted patient experiences one or more of the complications defined below. Complications other than mortality are counted in the measure only if they occur during the index admission or require a readmission. The measure does not count complications that occur in the outpatient setting and do not require a readmission.

The measure defines a “complication” as:

- Acute myocardial infarction (AMI), pneumonia, or sepsis/septicemia/shock during the index admission or a subsequent inpatient admission that occurs within seven days from the start of the index admission
- Surgical site bleeding or pulmonary embolism during the index admission or a subsequent inpatient admission within 30 days from the start of the index admission
- Death during the index admission or within 30 days from the start of the index admission
- Mechanical complication or periprosthetic joint infection/wound infection during the index admission or a subsequent inpatient admission that occurs within 90 days from the start of the index admission
- Note: A comprehensive list of ICD-10 codes used to define the complications are listed in the 2024 THA/TKA Complication Measure Code Specifications code tables available via links provided in [Section I](#)

The measure counts all complications occurring during the index admission regardless of when they occur. For example, if a patient experiences an AMI on day ten of the index admission, while still admitted to the hospital, the measure will count the AMI as a complication, although the specified follow-up period for AMI is seven days.

E. Population Measured (Denominator)

Eligible index admissions include Medicare Fee-For-Service (FFS) beneficiaries who are at least 65 years of age who have undergone a qualifying elective primary THA and/or TKA procedure at a non-federal, short-stay, acute-care or critical access hospital during the performance period. Eligible index admissions must have been enrolled in Medicare FFS Part A and B for the 12 months prior to the date of admission and Part A during the index admission and 90 days after it. Eligible index admissions are identified using International Classification of Diseases, Tenth Revision Procedure Coding System (ICD-10-PCS) procedure codes in Medicare inpatient claims data.

Qualifying elective primary THA/TKA procedures are defined as those procedures without any of the following:

- Femur, hip, or pelvic fractures
- Partial hip arthroplasty procedures (with a concurrent THA/TKA)
- Revision procedures with a concurrent THA/TKA
- Resurfacing procedures with a concurrent THA/TKA
- Mechanical complication
- Malignant neoplasm of the pelvis, sacrum, coccyx, lower limbs, or bone/bone marrow or a disseminated malignant neoplasm
- Removal of implanted devices/prostheses

F. Exclusions

Hospitalizations are generally excluded from the denominator for beneficiaries:

- Who survived the index admission but without 90-day Medicare part A enrollment post discharge, except for death within 90 days of index admission
- Who were transferred to the index hospital
- Who leave the hospital against medical advice (AMA)
- With more than two THA/TKA procedures coded during the index hospitalization
- Who cannot be attributed to a clinician or clinician group
- With a principal or a secondary diagnosis code of COVID-19 coded as present on admission (POA) on the index admission claim
- Note: A comprehensive list of all exclusions, including excluded ICD-10 codes, is available via links provided in [Section I](#).

G. Data Collection Approach and Measure Calculation

This measure is calculated from Medicare FFS claims (Parts A and B, both inpatient and outpatient) and Medicare beneficiary enrollment data; no additional data submission is required. The measure uses three years of inpatient claims to identify index admissions for THA and TKA procedures and one year prior of inpatient, outpatient, and physician Medicare administrative claims data to collect diagnoses for risk adjustment and 90 days post index admission for outcome determination. (Based on index admissions from October 1, 2021, to September 30, 2024, with complication outcomes assessed through December 2024)

H. Methodological Information and Measure Construction

Attribution. The measure attributes complications following THA and/or TKA procedures to MIPS participating clinicians and/or clinician groups.

Each patient index admission, and therefore their outcome (complication or no complication), is attributed to the clinician who bills for the qualifying THA/TKA procedure (Billing Surgeon).

In practice, patients may have different claims for the same procedure, and so the Billing Surgeon is assigned through an algorithm.

If only one clinician bills for a THA or TKA for a patient, the algorithm identifies and assigns this individual as the Billing Surgeon.


If two or more clinicians bill for THA/TKA procedures, the algorithm seeks to identify the clinician who billed for a THA or TKA procedure and is not an assistant-at-surgery.

If a single clinician who is not an assistant-at-surgery could not be identified for assignment, then the algorithm identifies whether there is a single clinician who was an orthopedic surgeon and assigns this as the Billing Surgeon.

If the algorithm cannot identify a Billing Surgeon using rules 1-3, it identifies whether an Operator is listed on the institutional claim.

Finally, if a Billing Surgeon or Operator cannot be identified with the steps above, the patient is not assigned to a clinician or clinician group and is excluded from the measure.

Once an individual eligible clinician is identified using the attribution algorithm, the clinician is assigned to an eligible clinician group, if appropriate. If the clinician is identified using rules 1-3, the TIN on the attributing claim is used to assign the patient to a TIN. If the clinician is assigned using rule 4, the NPI of the identified eligible clinician is matched to the TIN with the most Part B allowed charges during the index admission or during the measurement year, if the clinician did not bill during the index admission.



Risk adjustment and measure construction. The measure adjusts for patient case mix, including age, sex, whether the patient had one or two procedures, and select clinical comorbid conditions at the time of the index admission or within the preceding 12 months. The measure does not adjust for complications that arise during the hospitalization.

At the patient level, the model estimates the log-odds of a complication occurring within 90 days of the index admission adjusting for age, sex, and selected clinical covariates.

At the clinician level, the model estimates a provider-specific intercept for each provider (NPI or TIN); this represents the underlying risk of a complication for patients treated by the provider after accounting for patient risk. The RSCR is calculated as the ratio of the number of “predicted” admissions with a complication to the number of “expected” admissions with a complication for a given clinician, multiplied by the national observed complication rate. For each clinician, the numerator of the ratio is the number of admissions with a complication “predicted” from the model, based on the clinician’s performance with its observed case mix. The denominator of the ratio is the number of admissions with a complication “expected” based on the nation’s performance with that clinician’s case mix. Thus, a lower ratio indicates lower-than-expected complication rates or better quality, and a higher ratio indicates higher-than-expected complication rates or worse quality.

I. For Further Information

To access additional measure specifications and the code specification reports in Section [D](#), [E](#), and [J](#), please visit <https://qpp.cms.gov/about/resource-library>. Additional information on the THA/TKA RSCR measure is available on <https://qualitynet.cms.gov/> > Hospitals – Inpatient > Measures > Complications.

J. References

1. Grosso L, Curtis J, Geary L, et al. Hospital-level Risk-Standardized Complication Rate Following Elective Primary Total Hip Arthroplasty (THA) And/Or Total Knee Arthroplasty (TKA) Measure Methodology Report. 2012. (Original methodology report)
 2. Herrin J, Altaf F, et al. Risk-standardized Complication Rate (RSCR) Following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) for Merit- based Incentive Payment System (MIPS) Eligible Clinicians Methodology Report. 2019. (Last updated methodology report)
 3. DeBuhr J, Grady J, Norton E, et al. 2023 Procedure-Specific Complication Measure Updates and Specifications Report Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) — Version 12.0. Prepared for the Centers for Medicare and Medicaid Services. New Haven, CT: Yale New Haven Health Services Corporation/Center for Outcomes Research & Evaluation, 2023. (Updated annually and available in Spring).
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