Variation in 30-day mortality rates across hospitals following isolated coronary artery bypass graft surgery and complication rates following admission for elective primary total hip arthroplasty and/or total knee arthroplasty.

The Centers for Medicare & Medicaid Services (CMS) evaluates the distribution of measure results in order to monitor patterns, changes, and potential unintended consequences in the measure results. This information allows CMS to better understand the current state of care within U.S. hospitals. The isolated coronary artery bypass graft (CABG) mortality measure assesses mortality for any reason within 30 days of the procedure date for isolated CABG, regardless of whether the patient dies while still in the hospital or after being discharged from the hospital [1]. "Isolated" CABG procedures are those performed without concomitant high-risk cardiac and non-cardiac procedures, such as valve replacement. The elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) complication measure assesses the occurrence of significant medical and/or surgical complications within 7 to 90 days, depending on the complication, from the date of admission for elective primary THA/TKA [2]. Medical and surgical complications include:

- Acute myocardial infarction (AMI), pneumonia, or sepsis/septicemia during the index admission or within 7 days from the date of admission;
- Surgical site bleeding, pulmonary embolism or death during the index admission or within the 30 days from the date of the index admission; or
- Mechanical complications, periprosthetic joint infection, or wound infection during the index admission or within 90 days from the date of the index admission [2].

The CABG mortality and THA/TKA complication measures include admissions for Medicare fee-for-service (FFS) beneficiaries aged 65 or older. CMS began publicly reporting risk-standardized complication rates (RSCRs) following elective primary THA/TKA in 2013, and risk-standardized mortality rates (RSMRs) following isolated CABG surgery in 2015 [3]. Publicly reported measure results are updated annually on the Hospital Compare website. The THA/TKA complication measure and CABG mortality measure will be included in the Hospital Value-Based Purchasing (HVBP) Program beginning in 2019 and 2022, respectively [4, 5].

Variation in procedure-specific RSMRs and RSCRs reflects differences in performance among hospitals; wider distributions suggest more variation in quality, and narrower distributions suggest less variation in quality. To determine the extent of variation present in these measures, we examined hospital CABG RSMRs for each year in the July 2013 – June 2016 reporting period and hospital THA/TKA RSCRs for each year of the April 2013 – March 2016 reporting period. We included hospitals with 25 or more qualifying cases. To ensure accurate assessment of each hospital, the measures use a statistical model to adjust for key differences in patient risk factors that are clinically relevant and that have strong relationships with the outcome [1, 2].

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Hospital RSMRs for CABG and RSCRs for THA/TKA were normally distributed and centered at 3.1% and 2.7%, respectively (Figure 1 and Table 1; Figure 2 and Table 2). Additionally, hospitals were distributed over an interquartile range (IQR) of 1.2 and 0.6 percentage points, respectively (Table 1 and Table 2).

For the CABG and THA/TKA procedure-specific mortality and complication measures, half of the hospitals had RSMRs and RSCRs within 1.2 and 0.6 percentage points of the median hospital RSMR and RSCR. The range in RSMRs and RSCRs across all hospitals was 6.1 and 4.2 percentage points, respectively. This demonstrates that there are continued opportunities for improvement in both measures.


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