1. Introduction/Overview of Comprehensive Care for Joint Replacement Model (CJR) Quality Strategy

This document describes the methods for calculating performance on the quality measures, applying the quality results to payment, and the public reporting of quality measure results for hospitals participating in the CMMI Comprehensive Care for Joint Replacement Model (CJR).

Over the past several years, Medicare payment policy has moved away from fee-for-service (FFS) payments unlinked to quality and towards payments that are linked to quality of care. In the Final Rule, we presented our belief that CJR would test an episode payment model with the goals of improved quality of care and cost efficiency. Incentivizing high value care through episode-based payments for lower extremity joint replacement (LEJR) procedures is a primary objective of CJR. Therefore, incorporating quality performance into the episode payment structure is an essential component of CJR.

In the Final Rule, we adopted two quality measures and the voluntary reporting of Patient Reported Outcome (PRO) data that will be used in a composite quality score methodology to link the quality of total hip arthroplasty/total knee arthroplasty (THA/TKA) procedures in participant hospitals to payment. This document provides the details of this methodology.

2. Quality Measures

2.1. Hospital-level risk-standardized complication rate (RSCR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) (NQF #1550)

The CJR model will use the hospital-level risk-standardized complication rate (RSCR) following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) (THA/TKA Complications measure) (NQF #1550). The THA/TKA Complications measure (NQF #1550) is currently implemented in the Hospital Inpatient Quality Reporting (HIQR) Program and the Hospital Value-Based Purchasing (HVBP) Program and assesses a hospital's risk standardized complication rate, which is the rate of complications occurring after elective primary THA and TKA surgery. The measure outcome is the rate of complications occurring after THA and/or TKA surgical procedures during a 90-day period that begins with the date of the index admission for a specific hospital; an index admission is the hospitalization to which the complications outcome is attributed. The following outcomes (one or more) are considered complications in this measure:

- acute myocardial infarction;
- pneumonia, or sepsis/septicemia within 7 days of admission;
- surgical site bleeding, pulmonary embolism or death within 30 days of admission; or
- mechanical complications, periprosthetic joint infection, or wound infection within 90 days of admission.

For a full description of the current measure specifications, see "Version4.0_Complications_Hip-Knee_Measure_Updates_Report_3.25.15_With_Measure_Results" in the Hip and Knee

Arthroplasty Complications Updates zip file under downloads on the CMS website at: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html

2.2. Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey measure (NQF #0166)

The CJR model will also use the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey measure (NQF #0166), which is a national, standardized, publicly reported survey of patients' experience of hospital care. The HCAHPS Survey measure, also known as the CAHPS® Hospital Survey, is a survey instrument and data collection methodology for measuring patients' perceptions of their hospital experience. The HCAHPS Survey asks recently discharged adult patients 32 questions about aspects of their hospital experience that they are uniquely suited to address. The core of the survey contains 21 items that ask "how often" or whether patients experienced a critical aspect of hospital care. The survey also includes four items to direct patients to relevant questions, five items to adjust for the mix of patients across hospitals, and two items that support Congressionally-mandated reports (see 77 FR 53513 through 53515).

In the Final Rule, we noted that 11 HCAHPS measures (seven composite measures, two individual items and two global items) are currently publicly reported on the Hospital Compare website (http://www.hospitalcompare.hhs.gov/) for each hospital participating in the HIQR Program (79 FR 50259). Each of the seven currently reported composite measures is constructed from two or three survey questions. The seven composites summarize the following:

- how well doctors communicate with patients.
- how well nurses communicate with patients.
- how responsive hospital staff are to patients' needs.
- how well hospital staff helps patients manage pain.
- how well the staff communicates with patients about medicines.
- whether key information is provided at discharge.
- how well the patient was prepared for the transition to post-hospital care.

The two individual items address the cleanliness and quietness of patients' rooms, while the two global items report patients' overall rating of the hospital, and whether they would recommend the hospital to family and friends.

2.2.1. Patient Population

The HCAHPS Survey is administered to a random sample of adult inpatients between 48 hours and 6 weeks after discharge. The patient population that the HCAHPS survey (NQF #0166) measure assesses: 1) is not limited to Medicare beneficiaries and does not distinguish between

types of Medicare beneficiaries; and 2) includes patients admitted in the medical, surgical and maternity care service lines.

2.2.2. HCAHPS Scoring

In determining HCAHPS performance, we are using the HCAHPS Linear Mean Roll-up (HLMR) score, which summarizes performance across the 11 publicly reported HCAHPS measures. Participation in the model is limited to IPPS hospitals and must have 100 or more completed HCAHPS surveys in a 4-quarter period. The HLMR is calculated by taking the average of the linear mean scores (LMS) for each of the 11 publicly reported HCAHPS measures. The LMS, which was created for the calculation of the HCAHPS Star Ratings, summarizes all survey responses for each HCAHPS measure. A detailed description of LMS can be found in HCAHPS Star Rating Technical Notes, at http://www.hcahpsonline.org/StarRatings.aspx .

To calculate the HLMR, responses to the survey items used in each of the 11 HCAHPS measures described previously are combined and converted to a 0 to 100 linear-scaled score (i.e., LMS) as follows:

- "Never" = 0; "Sometimes" = 33 1/3; "Usually" = 66 2/3; and "Always" = 100 (For HCAHPS Survey items 1-9, 11, 13-14, and 16-17)
- "No" = 0; and "Yes" = 100 (For items 19 and 20)
- Overall Rating "0" = 0; Overall Rating "1" = 10; Overall Rating "2" = 20; …; Overall Rating "10" = 100 (For item 21)
- "Definitely No" = 0; "Probably No" = 33 1/3; "Probably Yes" = 66 2/3; and "Definitely Yes" = 100 (For item 22)
- "Strongly Disagree" = 0; "Disagree" = 33 1/3; "Agree" = 66 2/3; and "Strongly Agree" = 100 (For items 23, 24, and 25)

The 0 to 100 linear-scaled HCAHPS scores are then adjusted for patient mix, survey mode, and quarterly weighting; see http://www.hcahpsonline.org/files/HCAHPS_Stars_Tech_Notes_Apr2015.pdf.

The HLMR summarizes performance across the 11 HCAHPS measures by taking an average of each of the LMS of the 11 HCAHPS measures using a weight of 1.0 for each of the 7 HCAHPS composite measures, and a weight of 0.5 for each of the single item measures (Cleanliness, Quietness, Overall Hospital Rating, and Recommend the Hospital). The HLMR is calculated to the second decimal place.

A detailed discussion of the HCAHPS Survey, the survey itself and the protocols for sampling, data collection, coding, and file submission can be found in the current HCAHPS Quality Assurance Guidelines manual, available on the HCAHPS website located at: http://www.hcahpsonline.org. The HCAHPS Survey is available in several languages; all official translations of the HCAHPS instrument are available in the current HCAHPS Quality Assurance Guidelines at http://www.hcahpsonline.org/qaguidelines.aspx.

2.3. Voluntary Submission of Patient Reported Outcome (PRO) Data

2.3.1. Background

The CJR model includes voluntary submission of patient-reported outcomes (PRO) and risk variable data associated with primary elective THA/TKA procedures (hereafter referred to as "THA/TKA voluntary PRO and risk variable data"). The THA/TKA voluntary PRO and risk variable data submission initiative will allow us to begin to assess post-operative functional outcomes. Integrating this voluntary data submission initiative in the model will provide an opportunity to collect data from the patient's perspective, data that are necessary to finalize and test the specifications of a hospital-level, risk-adjusted patient-reported outcome performance measure (PRO-PM) for primary elective THA/TKA surgical procedures.

Access to this national representative voluntarily submitted data will enable us to do the following:

- Determine a parsimonious set of risk factors that are statistically adequate for risk adjustment for patient-reported outcome.
- Examine the differences in hospital performance related to different components in the patient-reported outcome (such as functional status, pain, etc.) to finalize the statistical modeling methodology for risk adjustment.
- Evaluate the reliability of the patient-reported outcome measure.
- Examine validity of the patient-reported outcome measure upon finalization of the risk adjustment model via potential testing methods such as face validity testing with national experts and comparing the measure results to similar results based on other data sources if feasible.

We anticipate completion of measure development for the future hospital-level THA/TKA PRO-PM during or before year 3 of the CJR model. We will consider adding or removing PRO and/or risk variable data elements as indicated by clinical practice and empiric analyses supporting or refuting their utility in performance measurement. For draft specifications of the THA/TKA PRO-PM, see the Draft Patient-Reported Outcomes Following Elective Primary Total Hip and/or Total Knee Arthroplasty (THA/TKA): Hospital-Level Performance Measure(s) Phase 3 Measure Methodology Report in the Hip and Knee Arthroplasty Patient-Reported Outcomes zip file under downloads on the CMS website at: https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/Measure-Methodology.html. Finally, as discussed in the Final Rule, we anticipate integrating this new THA/TKA PRO-PM as a mandatory measure in the CJR model in years 4 and 5, with details to be proposed during future rulemaking. If adopted in the CJR model, the THA/TKA PRO-PM would be added to the existing set of quality measures used in the CJR model, like the THA/TKA Complications measure (NQF #1550) and HCAHPS Survey measure (NQF #0166), and be tied to payment. Prior to adopting a fully developed PRO-PM in years 4 and 5 of the CJR model, we would notify the public through future rulemaking cycles.

2.4. THA/TKA Voluntary PRO and Risk Variable Data Collection

Table 2.4 contains the list of PRO data and a limited set of risk variables required to be considered as successfully submitting voluntary data. These variables include 4 unique patient identifier(s) to enable matching of the PRO data with administrative claims data. Eleven risk variable data elements were finalized.

Pre-operative data collection must be completed between 90 to 0 days prior to the THA/TKA procedure. Patients eligible for preoperative THA/TKA voluntary data submission are those described in section III.D.3.a.(3) of the proposed rule, and section III.D.3.a.(9) of the final rule.

Post-operative data collection must be completed between 270 to 365 days after the THA/TKA procedure. Patients eligible for post-operative THA/TKA voluntary data submission are those described in section III.D.3.a.(3) of the proposed rule and section III.D.3.a.(9) of the final rule. Eligible patients also have had a THA/TKA procedure date during the anchor hospitalization at least 366 days prior to the end of the data collection period. Therefore, hospitals are not expected to collect and submit post-operative THA/TKA voluntary data on patients who are fewer than 366 days from the date of surgery.

2.4.1. THA/TKA Voluntary PRO and Risk Variable Data Submission

THA/TKA voluntary data submission must occur within 60 days of the end of the most recent data collection performance period. Regarding the process for data collection, all THA/TKA voluntary PRO and risk variable data will be submitted to and collected by a CMS contractor in a manner and format similar to existing CMS data submission processes. CMS will supply applicable hospitals with a file template and instructions for populating the file template with data and submitting the data; the hospitals will populate the template according to their own data collection method and format, log in to a secure portal, and transmit the file to the appropriate CMS contractor; the CMS contractor will also match the submitted data to Medicare administrative claims-based data and calculate completeness for determination of the reconciliation payment. We will provide additional education and resources on how to use these mechanisms for data collection.

TABLE 2.4: DATA ELEMENTS TO BE SUBMITTED FOR SUCCESSFUL PARTICIPATION IN VOLUNTARY PATIENT-REPORTED OUTCOME DATA COLLECTION

Data Items	Finalized PRO and Risk Variable Data Elements	Definition of Finalized PRO and Risk Variable Data Elements	Timing of Collection
Age	N/A	(Will be captured by linking to claims data)	N/A
Date of Birth[§]	Date of Birth	(MM/DD/YYYY)	-90 to 0 days prior to and 270 to 365 days after THA/TKA procedure (to be used for linking to claims data)
Gender	N/A	(Will be captured by linking to claims data)	N/A
Race and Ethnicity[§]	Race and Ethnicity	Race: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White Ethnicity: Hispanic or Latino, Not Hispanic or Latino	-90 to 0 days prior to THA/TKA procedure
THA or TKA procedure	N/A	(Will be captured as possible by linking to claims data)	N/A
Date of admission to anchor hospitalization[§]	Date of admission to anchor hospitalization	(MM/DD/YYYY)	270 to 365 days after THA/TKA procedure (to be used for linking to claims data)
Date of discharge from anchor hospitalization	N/A	(Will be captured as possible by linking to claims data)	N/A
Date of eligible THA/TKA procedure[§]	Date of eligible THA/TKA procedure	(MM/DD/YYYY)	270 to 365 days after THA/TKA procedure (to be used for linking to claims data)
Medicare Health Insurance Claim Number[§]	Unique Identifier	Medicare Health Insurance Claim Number	-90 to 0 days prior to and 270 to 365 days after THA/TKA procedure (to be used for linking to claims data)
PROMIS Global (all items)	Generic PROM Instrument for THA and TKA Procedures	VR-12 OR PROMIS-Global	-90 to 0 days prior to and 270 to 365 days after THA/TKA procedure

Data Items	Finalized PRO and Risk Variable Data Elements	Definition of Finalized PRO and Risk Variable Data Elements	Timing of Collection
VR–12 (all items.)	Generic PROM Instrument for THA and TKA Procedures	VR-12 OR PROMIS-Global	-90 to 0 days prior to and 270 to 365 days after THA/TKA procedure
For TKA patients Knee injury and Osteoarthritis Outcome Score (*KOOS*[75]) (all items)	Knee-Specific PROM Instrument for TKA Procedures	KOOS Jr. Only OR KOOS Stiffness Subscale AND KOOS Pain Subscale AND KOOS Function, Daily Living Subscale	-90 to 0 days prior to and 270 to 365 days after TKA procedure
For THA patients Hip disability and Osteoarthritis Outcome Score (*HOOS*[76]) (all items)	Hip-Specific PROM Instrument for THA Procedures	HOOS Jr. Only OR HOOS Pain Subscale AND HOOS Function, Daily Living Subscale	-90 to 0 days prior to and 270 to 365 days after THA procedure
Body Mass Index[§]	Body Mass Index (or height in cm and weight in kg)	Body Mass Index (or height in cm and weight in kg)	-90 to 0 days prior to THA/TKA procedure
Presence of live-in home support, including spouse	N/A	(Will be captured by linking to claims data)	N/A
Use of chronic (≥ 90 day) narcotics[§]	Pre-operative use of narcotics	Provider-reported yes/no	-90 to 0 days prior to THA/TKA procedure
American Society of Anesthesiologists (ASA) physical status classification	N/A	N/A	N/A
Charnley Classification	N/A	N/A	N/A
Presence of retained hardware	N/A	(Will be captured by linking to claims data)	N/A
Total painful joint count[1§]	Patient-Reported Pain in Non-operative Lower Extremity Joint	"What amount of pain have you experienced in the last week in your other knee/hip?" (none, mild, moderate, severe, extreme) [2]	-90 to 0 days prior to THA/TKA procedure
Quantified spinal pain[§]	Patient-Reported Back Pain (Oswestry Index question)	"My BACK PAIN at the moment is" (none, very mild, moderate, fairly severe, very severe, worst imaginable)[3,4]	-90 to 0 days prior to THA/TKA procedure

[1]Wallace LS, Rogers ES, Roskos SE, Holiday DB, and Weiss BD. BRIEF REPORT: Screening Items to Identify Patients with Limited Health Literacy Skills. J Gen Intern Med. 2006;21(8):874-7.

[2]Ayers DC, Li W, Oatis C, Rosal MC, Franklin PD. Patient-reported outcomes after total knee replacement vary on the basis of preoperative coexisting disease in the lumbar spine and other nonoperatively treated joints: the need for a musculoskeletal comorbidity index. J Bone Joint Surg Am. 2013 Oct 16;95(20):1833-7.

[3]Fairbank JC, Pynsent PB. The Oswestry Disability Index. Spine 2000 Nov 15;25(22):2940-52.

[4]Ayers DC, Li W, Oatis C, Rosal MC, Franklin PD. Patient-reported outcomes after total knee replacement vary on the basis of preoperative coexisting disease in the lumbar spine and other nonoperatively treated joints: the need for *a musculoskeletal comorbidity index.* J Bone Joint Surg Am. 2013 Oct 16;95(20):1833-7. doi: 10.2106/JBJS.L.01007.

Data Items	Finalized PRO and Risk Variable Data Elements	Definition of Finalized PRO and Risk Variable Data Elements	Timing of Collection
Joint range of motion in degrees (specify hip or knee)	N/A	N/A	N/A
Use of gait aides	N/A	N/A	N/A
For THA patients abductor muscles strength	N/A	N/A	N/A
For THA patients presence of Trendelenberg gait	N/A	N/A	N/A
For THA patients history of congenital hip dysplasia or other congenital hip disease	N/A	(Will be captured as possible by linking to claims data)	N/A
For THA patients presence of angular, translational, or rotational deformities of the proximal femur (in degrees)	N/A	(Will be captured as possible by linking to claims data)	N/A
For TKA patients anatomic angle (femoro-tibial angle) in degrees with varus/valgus	N/A	N/A	N/A
For TKA patients knee extensor strength	N/A	N/A	N/A
Single Item Health Literacy Screening (SILS2) questionnaire.[§]	Patient-Reported Health Literacy	"How comfortable are you filling out medical forms by yourself?" (extremely, quite a bit, somewhat, a little bit, or not at all)[5]	-90 to 0 days prior to THA/TKA procedure

3. Performance Periods

3.1. Hospital-Level Risk-Standardized Complication Rate (RSCR) Following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) (NQF #1550)

We will use a three-year rolling performance period as finalized for the THA/TKA Complications measure (NQF #1550), which is consistent with the performance period used for the same measure in the HIQR Program. The applicable performance periods for the THA/TKA Complications measure (NQF #1550) during the CJR model are summarized in Table 3.1.

[5]Wallace LS, Rogers ES, Roskos SE, Holiday DB, and Weiss BD. BRIEF REPORT: Screening Items to Identify Patients with Limited Health Literacy Skills. J Gen Intern Med. 2006;21(8):874-7.

TABLE 3.1. SUMMARY OF THA/TKA COMPLICATIONS MEASURE PERFORMANCE PERIODS BY YEAR OF THE CJR Model

Measure	CJR Model Year				
	1st	2nd	3rd	4th	5th
THA/TKA Complications	April 1, 2013 - March 31, 2016	April 1, 2014 - March 31, 2017	April 1, 2015 - March 31, 2018	April 1, 2016 - March 31, 2019	April 1, 2017 - March 31, 2020

3.2. Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey (NQF #0166)

Consistent with the HIQR Program and for the CJR, the HCAHPS scores will be based on 4 consecutive quarters of survey data. For the HCAHPS Survey measure, we have finalized a performance period that is consistent with the performance period used for the same measure in the HIQR Program (FY 2015 IPPS/LTCH Final Rule (79 FR 50259)).

TABLE 3.2: SUMMARY OF FINALIZED QUALITY MEASURE PERFORMANCE PERIODS BY YEAR OF THE CJR

Measure Title	**CJR Model Year**				
	1st	**2nd**	**3rd**	**4th**	**5th**
THA/TKA Complications*	April 1, 2013 – March 31, 2016	April 1, 2014 – March 31, 2017	April 1, 2015 – March 31, 2018	April 1, 2016 – March 31, 2019	April 1, 2017 – March 31, 2020
HCAHPS**	July 1, 2015 – June 30, 2016	July 1, 2016 – June 30, 2017	July 1, 2017 – June 30, 2018	July 1, 2018 – June 30, 2019	July 1, 2019 – June 30, 2020

*Hospital-Level Risk-Standardized Complication Rate (RSCR) Following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) measure (NQF #1550).
** Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey measure (NQF #0166).

3.3. THA/TKA Voluntary PRO and Limited Risk Variable Data and Description of Successful Data Collection and Submission

Hospitals will start by collecting pre-operative data in year 1 of the CJR model. The post-operative data collected in year 2 will correspond to the pre-operative data collected in year 1 and, similarly, for years 3 through 5. That is, participating hospitals will collect and submit post-operative data for the same cases for which the hospital submitted pre-operative data in the preceding year. See Table 3.3 for performance periods for pre- and post-operative data submission.

The definition of "successful criterion" for voluntary patient-reported outcome data collection for year 1 will entail each participating hospital submitting the required pre- and post-operative data elements finalized and listed in Table 3.3. In general, to be considered "successful" in collecting the THA/TKA voluntary PRO and limited risk variable data (see Tables 3.3 and 2.4 respectively), hospitals must collect and submit data on an increasing number of eligible patients with each year of the CJR. For example, in the first year of the CJR model, successful submission of THA/TKA voluntary PRO and limited risk variable data is defined in Table 3.3 as submitting data on either 50 percent of eligible procedures, or a total of 50 procedures, during the data collection period in order to satisfy the voluntary patient-reported outcome data collection requirement. In year 2 of the model, the successful criterion for post-operative eligible patients would be submission of POST-operative data on primary elective THA/TKA procedures for ≥ 50% or ≥ 50 eligible procedures performed between July 1, 2016 through August 31, 2016 AND for PRE-operative eligible procedures submission of pre-operative data on primary elective THA/TKA procedures for ≥ 60% or ≥ 75 procedures performed between September 1, 2016 through June 30, 2017.

TABLE 3.3: FINALIZED PERFORMANCE PERIODS FOR PRE- AND POST-OPERATIVE THA/TKA VOLUNTARY DATA SUBMISSION

Model Year	Performance Period	Duration of the Performance Period	Patient Population Eligible for THA/TKA Voluntary Data Submission	Requirements for Successful THA/TKA Voluntary Data Submission
2016	July 1, 2016 through August 31, 2016	2 months	All patients undergoing elective primary THA/TKA procedures performed between July 1, 2016 and August 31, 2016.	Submit PRE-operative data on primary elective THA/TKA procedures for ≥ 50% or ≥ 50 eligible procedures performed between July 1, 2016 and August 31, 2016.

Model Year	Performance Period	Duration of the Performance Period	Patient Population Eligible for THA/TKA Voluntary Data Submission	Requirements for Successful THA/TKA Voluntary Data Submission
2017	July 1, 2016 through August 31, 2016	13 months	All patients undergoing elective primary THA/TKA procedures performed between July 1, 2016 through August 31, 2016.	Submit POST-operative data on primary elective THA/TKA procedures for ≥ 50% or ≥ 50 eligible procedures performed between July 1, 2016 through August 31, 2016.
2017	September 1, 2016 through June 30, 2017		All patients undergoing elective primary THA/TKA procedures performed between September 1, 2016 through June 30, 2017.	Submit PRE-operative data on primary elective THA/TKA procedures for ≥ 60% or ≥ 75 procedures performed between September 1, 2016 through June 30, 2017.

Model Year	Performance Period	Duration of the Performance Period	Patient Population Eligible for THA/TKA Voluntary Data Submission	Requirements for Successful THA/TKA Voluntary Data Submission
2018	September 1, 2016 through June 30, 2017	22 months	All patients undergoing elective primary THA/TKA procedures performed between September 1, 2016 and June 30, 2017.	Submit POST-operative data on primary elective THA/TKA procedures for ≥ 60% or ≥ 75 procedures performed between September 1, 2016 and June 30, 2017.
2018	July 1, 2017 through June 30, 2018		All patients undergoing elective primary THA/TKA procedures performed between July 1, 2017 and June 30, 2018.	Submit PRE-operative data on primary elective THA/TKA procedures for ≥ 70% or ≥ 100 procedures performed between July 1, 2017 and June 30, 2018.
2019	July 1, 2017 through June 30, 2018	24 months	All patients undergoing elective primary THA/TKA procedures performed between July 1, 2017 and June 30, 2018.	Submit POST-operative data on primary elective THA/TKA procedures for ≥ 70% or ≥ 100 procedures performed between July 1, 2017 and June 30, 2018.

Model Year	Performance Period	Duration of the Performance Period	Patient Population Eligible for THA/TKA Voluntary Data Submission	Requirements for Successful THA/TKA Voluntary Data Submission
2019	July 1, 2018 through June 30, 2019	24 months	All patients undergoing elective primary THA/TKA procedures performed between July 1, 2018 and June 30, 2019.	Submit PRE-operative data on primary elective THA/TKA procedures for ≥ 80% or ≥ 200 procedures performed between July 1, 2018 and June 30, 2019.
2020	July 1, 2018 through June 30, 2019		All patients undergoing elective primary THA/TKA procedures performed between July 1, 2018 and June 30, 2019.	Submit POST-operative data on primary elective THA/TKA procedures for ≥ 80% or ≥ 200 procedures performed between July 1, 2018 and June 30, 2019.
2020	July 1, 2019 through June 30, 2020		All patients undergoing elective primary THA/TKA procedures performed between July 1, 2019 and June 30, 2020.	Submit PRE-operative data on primary elective THA/TKA procedures for ≥ 80% or ≥ 200 procedures performed between July 1, 2019 and June 30, 2020.

4. Applying Performance on Quality Measures to Payment

4.1. Background

Based on the Final Rule for the methodology on determining reconciliation payment eligibility and quality incentive payments, we will assign participant hospital required outcome measure

point estimates to performance percentiles based on the national distribution. We will use a composite quality score based on achievement and improvement on the THA/TKA Complications measure (NQF #1550) and the HCAHPS Survey measure (NQF #0166), as well as submission of THA/TKA voluntary reporting of the PRO and limited risk variable data, that place hospitals in one of four quality categories for each performance year, "Below Acceptable," "Acceptable," "Good," and "Excellent." The policies regarding the quality categories over the course of the model are described below and outlined in Tables 4.3, 4.4, and 4.5.

Under this methodology, there are three terms that are used in the intermediate steps to determine the quality categories. *Quality performance points* are points that CMS adds to a participant hospital's composite quality score for each measure based on the performance percentile scale that is posted on the CMS website and for successful data submission of patient reported outcomes. *Quality improvement points* are points that CMS adds for each measure to a participant hospital's composite quality score if the hospital's score on an individual quality measure increases from the previous performance year by at least three deciles on the performance percentile scale. *Composite quality score* means a score computed for each participant hospital to summarize the hospital's level of quality performance and improvement on specified quality measures. The composite quality score assigns different weights to the each of the measures based on the Final Rule. The measure weights for the composite quality score are: 1) 50 percent for the Hospital-level RSCR following elective primary THA and/or TKA (NQF #1550); 2) 40 percent for the HCAHPS Survey measure (NQF #0166); and 3) 10 percent for the THA/TKA voluntary patient-reported outcomes data submission, as outlined in Table 4.1. The details of this methodology are described below.

TABLE 4.1: QUALITY MEASURE WEIGHTS IN COMPOSITE QUALITY SCORE

Quality Measure	**Weight in Composite Quality Score**
Hospital-level RSCR following elective primary THA and/or TKA Complications measure (NQF #1550)	50%
HCAHPS survey measure (NQF #0166)	40%
THA/TKA PRO and limited Risk variable Voluntary Data	10%

4.2. Methodology for Applying Quality to Payment

4.2.1. Calculate the Quality Performance Score for Each Quality Measure

CMS assigns an individual Quality Performance Score for each participant hospital for each of the THA/TKA Complications measure (NQF #1550) and the HCAHPS Survey measure (NQF #0166), based on the participant hospital's performance percentile relative to the national distribution of all hospitals' performance on that measure.

To calculate quality performance points, CMS will first capture each participant hospital's measure performance on the THA/TKA Complications measure (NQF #1550), captured in the Hospital Inpatient Quality Reporting (HIQR) Program as described in previous sections. Next, CMS will capture the hospital's measure performance on the HCAHPS Survey measure (NQF #0166) based on the 4 most recent quarters in the HIQR Program as described above. Then, the national data for each measure for all hospitals in the HIQR program with reported measure data will be arrayed to determine a percentile distribution, at each decile, for the scores of each measure. Then, the hospital's quality measure performance on each measure will be assigned a percentile based on their performance on each measure compared to the national percentile distribution. Finally, the hospital will be assigned quality performance points based on where they fall on the scale of performance percentiles outlined in Table 4.2. The hospital will receive a quality performance score for each of the measures.

For example, if a participant hospital's performance on the THA/TKA Complications measure (NQF #1550) falls on the 85th percentile, based on national distribution, then that hospital will receive a quality performance score of 9.25 for the THA/TKA Complications measure (NQF #1550).

CMS will assign any low volume participant hospitals without a reportable value through the HIQR Program to the 50th performance percentile of that respective measure. A participant hospital will not have a measure value for the Hospital level risk standardized complication rate following elective primary total hip arthroplasty and/or total knee arthroplasty measure (NQF #1550) if the hospital does not meet the minimum 25 case count. A participant hospital will not have a measure value for the Hospital Consumer Assessment of Healthcare Providers and Systems Survey measure (NQF #0166) if the hospital does not meet the minimum of 100 completed survey and does not have 4 consecutive quarters of HCAHPS data.

The individual measure quality performance scores in Table 4.2 have been set to reflect the final measures weights in Table 4.1, so they can ultimately be summed without adjustment in calculating the composite quality score.

TABLE 4.2: INDIVIDUAL SCORING SCALE TO CALCULATE QUALITY PERFORMANCE SCORE FOR TWO REQUIRED QUALITY MEASURES

Performance Percentile	THA/TKA Complications measure (NQF #1550) Quality Performance Score (Points)	HCAHPS Survey measure (NQF #0166) Quality Performance Score (Points)
$\geq 90^{th}$	10.00	8.00
$\geq 80^{th}$ and $<90^{th}$	9.25	7.40
$\geq 70^{th}$ and $<80^{th}$	8.50	6.80
$\geq 60^{th}$ and $<70^{th}$	7.75	6.20
$\geq 50^{th}$ and $<60^{th}$	7.00	5.60
$\geq 40^{th}$ and $<50^{th}$	6.25	5.00
$\geq 30^{th}$ and $<50^{th}$	5.50	4.40
$<30^{th}$	0.0	0.0

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4.2.2. Calculate Quality Improvement Points for Each Quality Measure

CMS will add improvement points into the composite quality score equal to 10 percent of the maximum value for one of the required measures, which would equal 1 point for the THA/TKA Complications measure (NQF #1550) or 0.8 point for the HCAHPS Survey measure (NQF #0166), for those participant hospitals that demonstrate substantial improvement from the prior year's measure performance percentile on that measure. In order to be considered for improvement points on one of the measures, a participant hospital must have had a reportable measure performance value for that measure in the prior year. We are defining substantial as improving 3 deciles or more in comparison to the national distribution of performance percentiles.

For example, if a practice went from the 35^{th} percentile ($\geq 30^{th}$ and $<40^{th}$ on the scale) to the 65^{th} percentile ($\geq 60^{th}$ and $<70^{th}$) on one of the quality measures, then that hospital would receive the available improvement points for that measure.

4.2.3. Assign Credit for the Successful Reporting of Voluntary THA/TKA Patient Reported Outcomes and Limited Risk Variable Data

Finally, CMS will determine if the hospital meets the successful criterion for the voluntary reporting of the THA/TKA patient reported outcomes data and limited risk variable data, as described in Section 2.4. of this document. The definition of "successful criterion" for voluntary patient-reported outcomes and limited risk variable data collection for year 1 will entail each participant hospital submitting the required eleven risk variables AND pre- and post-operative data elements (see Table 2.4 for the final list of voluntary patient-reported outcome data elements) on either:

- 50 percent of eligible procedures; or
- A total of 50 eligible procedures

during the data collection period in order to satisfy the voluntary patient-reported outcomes and limited risk variable data collection requirement in year 1.

CMS will assign a measure quality score of two points towards the composite quality score for participant hospitals that successfully submit THA/TKA voluntary PRO and limited risk variable data and 0 points for participant hospitals that do not successfully submit these data.

For each subsequent year of the CJR model the limited risk variable data also will need to be submitted with increasing amounts of pre- and post-operative PRO data as outlined in Table 3.3.

4.2.4. Calculate the Composite Quality Score

CMS calculates a composite quality score for each participant hospital for each performance period, which equals the sum of:

a. the hospital's quality performance score for the THA/TKA Complications measure (NQF #1550);
b. the hospital's quality performance score for HCAHPS Survey measure (NQF #0166);
c. any additional quality improvement points the hospital may earn as a result of demonstrating improvement on either or both of the quality measures; and,
d. if applicable, 2 additional points for successful data submission of patient reported outcomes and limited risk variable data.

Once all of the achievement and improvement points are calculated for each measure, including the points awarded for reporting the THA/TKA PRO and limited risk variable data, all of the points will be added up to calculate the participant hospitals' composite quality score.

4.2.5. Incorporate the Composite Quality Score into the Pay-for-Performance Methodology

The composite quality score will then be incorporated into the pay-for-performance methodology for the CJR model that assigns a participant hospital to a quality category at the time of reconciliation for a performance year. We will first require a minimum composite quality score for reconciliation payment eligibility if the participant hospital's actual episode spending is less

than the target price and second, make quality incentive payments that change the effective discount percentage included in the target price experienced by the hospital in the reconciliation process. Thus, hospitals with higher composite quality scores may financially benefit from their episode quality performance compared to hospitals with lower quality performance in a different quality category, regardless of whether episode savings are achieved.

The discount for all participant hospitals included in the target prices will be 3.0 percent. Hospitals that provide high quality episode care will have the opportunity to receive quality incentive payments that will reduce the effective discount percentage as display in Tables 4.3, 4.4, and 4.5, based on their composite quality score that places each hospital into one of four quality categories, specifically "Below Acceptable," "Acceptable," "Good," and "Excellent." Three tables are required to display the effective discount percentages for each quality category due to the phase-in of hospital repayment responsibility from no responsibility in performance year 1, to partial responsibility in performance years 2 and 3, and finally full responsibility in performance years 4 and 5. Depending on the participant hospital's actual composite quality score that places the hospital in a quality category, quality incentive payments will be valued at 1.0 percent to 1.5 percent of the hospital's benchmark episode price (that is, of the expected episode spending prior to application of the discount factor to calculate a target price).

Hospitals will be required to achieve a minimum composite quality score greater than or equal to 4.0 to be eligible for a reconciliation payment if actual episode spending is less than the target price. Participant hospitals with below acceptable quality performance reflected in a composite quality score less than 4.0 will be assigned to the "Below Acceptable" quality category and will not be eligible for a reconciliation payment if actual episode spending is less than the target price. A level of quality performance that is below acceptable will not affect participant hospitals' repayment responsibility if actual spending exceeds the target price.

Participant hospitals with an acceptable composite quality score of greater than or equal to 4.0 and less than 6.0 will be assigned to the "Acceptable" quality category and be eligible for a reconciliation payment if actual episode spending is less than the target price because their quality performance is at the acceptable level established for the CJR model. They will not be eligible for a quality incentive payment at reconciliation because their episode quality performance, while acceptable, is not good or excellent. Therefore, these hospitals will be eligible to receive a reconciliation payment if actual episode spending is less than the target price.

Participant hospitals with a good composite quality score of greater than or equal to 6.0 and less than or equal to 13.2 will be assigned to the "Good" quality category and be eligible for a quality incentive payment at reconciliation if actual episode spending is less than the target price because their quality performance exceeds the acceptable level required for reconciliation payment eligibility under the CJR model. In addition, they will be eligible for a quality incentive payment at reconciliation for good quality performance that equals 1.0 percent of the participant hospital's benchmark price, thereby changing the effective discount percentage included in the target price experienced by the hospital at reconciliation. Thus, participant hospitals achieving this level of quality for LEJR episodes under the CJR model will either have less repayment

responsibility (that is, the quality incentive payment will offset a portion of their repayment responsibility) or receive a higher payment (that is, the quality incentive payment would add to the reconciliation payment) at reconciliation than they would have otherwise based on a comparison of actual episode spending to the target price that reflects a 3.0 percent discount. Therefore, these hospitals will be eligible to receive a reconciliation payment if actual episode spending is less than the target price and will also receive a quality incentive payment.

Finally, hospitals with an excellent composite quality score of greater than 13.2 will be assigned to the "Excellent" quality category and be eligible to receive a reconciliation payment if actual episode spending is less than the target price because their quality performance exceeds the acceptable level required for reconciliation payment eligibility under the CJR model. In addition, they will be eligible for a higher quality incentive payment at reconciliation for excellent quality performance that equals 1.5 percent of the participant hospital's benchmark price, thereby changing the effective discount percentage included in the target price experienced by the hospital at reconciliation. Thus, participant hospitals achieving this level of quality for LEJR episodes under the CJR model will either have less repayment responsibility (that is, the quality incentive payment will offset a portion of their repayment responsibility) or receive a higher payment (that is, the quality incentive payment would add to the reconciliation payment) at reconciliation than they would have otherwise based on a comparison of actual episode spending to the target price that reflects a 3.0 percent discount. Therefore, these hospitals will be eligible to receive a reconciliation payment if actual episode spending is less than the target price and would also receive a quality incentive payment.

TABLE 4.3: PERFORMANCE YEAR 1:
RELATIONSHIP OF COMPOSITE QUALITY SCORE TO RECONCILIATION PAYMENT ELIGIBILITY AND THE EFFECTIVE DISCOUNT PERCENTAGE EXPERIENCED AT RECONCILIATION

Composite Quality Score	Quality Category	Eligible for Reconciliation Payment	Eligible for Quality Incentive Payment	Effective Discount Percentage for Reconciliation Payment	Effective Discount Percentage for Repayment Amount
<4.0	Below Acceptable	No	No	3.0%	Not applicable
≥4.0 and <6.0	Acceptable	Yes	No	3.0%	Not applicable
≥6.0 and ≤13.2	Good	Yes	Yes	2.0%	Not applicable
>13.2	Excellent	Yes	Yes	1.5%	Not applicable

TABLE 4.4: PERFORMANCE YEARS 2 AND 3: RELATIONSHIP OF COMPOSITE QUALITY SCORE TO RECONCILIATION PAYMENT ELIGIBILITY AND THE EFFECTIVE DISCOUNT PERCENTAGE EXPERIENCED AT RECONCILIATION

Composite Quality Score	Quality Category	Eligible for Reconciliation Payment	Eligible for Quality Incentive Payment	Effective Discount Percentage for Reconciliation Payment	Effective Discount Percentage for Repayment Amount
<4.0	Below Acceptable	No	No	3.0%	2.0%
≥4.0 and <6.0	Acceptable	Yes	No	3.0%	2.0%
≥6.0 and ≤13.2	Good	Yes	Yes	2.0%	1.0%
>13.2	Excellent	Yes	Yes	1.5%	0.5%

TABLE 4.5: PERFORMANCE YEARS 4 AND 5: RELATIONSHIP OF COMPOSITE QUALITY SCORE TO RECONCILIATION PAYMENT ELIGIBILITY AND THE EFFECTIVE DISCOUNT PERCENTAGE EXPERIENCED AT RECONCILIATION

Composite Quality Score	Quality Category	Eligible for Reconciliation Payment	Eligible for Quality Incentive Payment	Effective Discount Percentage for Reconciliation Payment	Effective Discount Percentage for Repayment Amount
<4.0	Below Acceptable	No	No	3.0%	3.0%
≥4.0 and <6.0	Acceptable	Yes	No	3.0%	3.0%
≥6.0 and ≤13.2	Good	Yes	Yes	2.0%	2.0%
>13.2	Excellent	Yes	Yes	1.5%	1.5%

5. Public Reporting of Quality Data on Hospital Compare Website

We believe public reporting of quality data is an important way to educate the public on hospital performance. We will publicly report measure results for measures included in the CJR model

for each participant hospital on the *Hospital Compare* website in an easily understood format. The applicable performance periods for the measures during the CJR are summarized in Table 5.l.

TABLE 5.1: SUMMARY FOR QUALITY MEASURE REPORTING PERIODS BY YEAR

Measure Title	Year 1	Year 2	Year 3	Year 4	Year 5
THA/TKA Complications*	April 1, 2013–March 31, 2016	April 1, 2014–March 31, 2017	April 1, 2015–March 31, 2018	April 1, 2016–March 31, 2019	April 1, 2017–March 31, 2020
HCAHPS**	July 1, 2015–June 30, 2016	July 1, 2016–June 30, 2017	July 1, 2017–June 30, 2018	July 1, 2018–June 30, 2019	July 1, 2019–June 30, 2020

* Hospital-Level Risk-Standardized Complication Rate (RSCR) Following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) measre (NQF#1550).

** HCAHPS Survey measure (NQF #0166).

The performance periods for the THA/TKA Complications measure (NQF#1550) are consistent with HIQR Program performance periods for the same measure. For example, the performance period of this measure for year 1 of the CJR model aligns with the HIQR Program July 2017 public reporting performance period of this measure. The HCAHPS survey measure (NQF #0166) quality information will be based on four consecutive quarters of survey data, which is consistent with the HCAHPS Survey measure (NQF #0166) reporting periods in the HIQR Program; however, the public reporting of the HCAHPS survey measure (NQF #0166) results for the CJR model will be based on a different set of quarters than the HCAHPS scores concurrently reported for the HIQR Program. The CJR model performance periods align with the HIQR program performance periods as close as is reasonably possible.

TABLE 5.2: SUMMARY TIMELINE OF CJR MEASURES PUBLIC REPORTING

Measure Title	Frequency of Public Reporting	Month of Public Reporting on Hospital Compare	Form of Reports Provided to Participant Hospitals	Frequency of Distributing Reports to Participant Hospital	Month When Participant Hospitals Receive their Reports
THA/TKA Complication*	Annually	July	Preview Report and	Annually	April

			Hospital-Specific Report		
HCAHPS**	Annually	July	Preview Report	Annually	April

* Hospital-Level Risk-Standardized Complication Rate (RSCR) Following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) measure (NQF#1550).
** HCAHPS Survey measure (NQF #0166).

In order to minimize confusion and facilitate access to the data on the measures included in the CJR model, we plan to post the data on each participant hospital's performance on each of the finalized quality measures in a downloadable format in a section of the *Hospital Compare* website specific to the CJR model, similar to what is done for Hospital Readmission Reduction Program and the Hospital-Acquired Conditions Reduction Program. To do this we will post the absolute score on the measure, as well as the percentile score that is used to tie quality measure scores to payment. We will post the CJR-specific data on the same timeframe as the existing HIQR Program for July public reporting on the *Hospital Compare* website.

Finally, as discussed in the previous sections we are collecting THA/TKA voluntary PRO and limited risk variable data to support development of a patient-reported outcome functional status measure that we believe will provide needed information for patients and providers. The measure currently in development, Hospital-Level Performance Measure(s) of Patient-Reported Outcomes Following Elective Primary Total Hip and/or Total Knee Arthroplasty, requires comprehensive testing before it can be used in a CMS program. The voluntary THA/TKA patient-reported outcomes and limited risk variable data will not be publicly reported. Rather, CMS will publicly acknowledge that a hospital has participated in the THA/TKA voluntary PRO and limited risk variable data submission by placing a symbol by the hospital's name when posting the THA/TKA Complications measure (NQF #1550) and HCAHPS Survey measure (NQF #0166) results on *Hospital Compare* website.