



CMS Comprehensive Care for Joint Replacement Model: Performance Year 5 Evaluation Report – Executive Summary

Fifth Annual Report

HEALTH CARE AND HUMAN SERVICES POLICY, RESEARCH, AND ANALYTICS – WITH REAL-WORLD PERSPECTIVE.



Prepared for: **Centers for Medicare & Medicaid Services**

Submitted by: **The Lewin Group, Inc. with our partners: Abt Associates, GDIT, and Telligen**

April 2023



CMS Comprehensive Care for Joint Replacement (CJR) Model: Performance Year 5 Evaluation Report – Executive Summary

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Prepared for:

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This project was funded by the Centers for Medicare & Medicaid Services under contract no. HHSM-500-2014-00033I.

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Background

The fifth annual Comprehensive Care for Joint Replacement (CJR) model evaluation report presents findings from the first five performance years, which include episodes initiated on or after April 1, 2016 that ended by September 30, 2021. The CJR model tests whether episode-based payment and quality measurement for lower extremity joint replacements (LEJR) can lower payments and improve quality. Implemented on April 1, 2016 by the Centers for Medicare & Medicaid Services' (CMS) Innovation Center, this mandatory model is an important component of [CMS' strategy to use alternative payment models](#) (APMs) to slow Medicare spending growth by rewarding value rather than volume.

Report Highlights

In the first five performance years, mandatory CJR hospitals achieved a statistically significant reduction in average episode payments due to reductions in institutional post-acute care (PAC) use. For the first four performance years (2016-2019), mandatory hospitals generated Medicare savings after accounting for reconciliation payments, although the savings were not statistically significant. In the fifth performance year, the Coronavirus Disease 2019 (COVID-19) pandemic impacted the performance of the model in several ways. To provide hospitals with relief from the pandemic, CMS adopted the COVID-19 public health emergency (PHE) policy to remove downside risk, which did not require hospitals to make repayments for episodes in which payments exceeded the target price. Further, the volume of elective LEJRs dropped and both CJR and control hospitals reduced institutional PAC use during the public health emergency. This resulted in larger reconciliation payments to hospitals, smaller reductions in average episode payments, and statistically significant Medicare losses in the fifth performance year (2020-2021) that outweighed Medicare savings generated in the first four years (2016-2019). Quality of care, as measured by the unplanned readmission rate, emergency department (ED) use, mortality, and the elective LEJR complication rate improved or was maintained under the CJR model.

Model Design

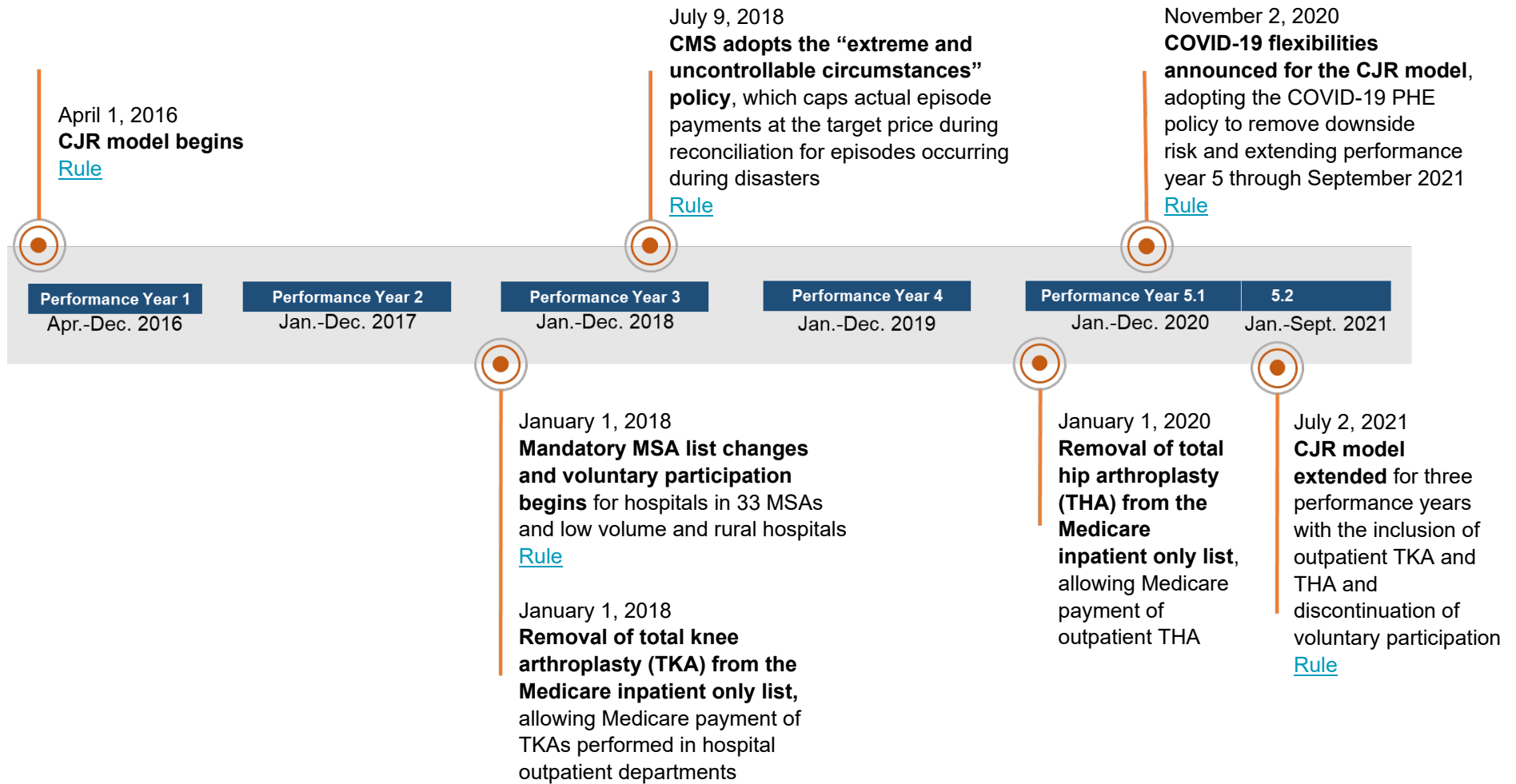
CJR participant hospitals are accountable for the cost and quality of health care services for LEJR episodes of care. LEJR surgeries are primarily hip replacements (total hip arthroplasty or THA) and knee replacements (total knee arthroplasty or TKA). An episode of care begins with the hospitalization for the LEJR surgery and extends through the 90 days after hospital discharge. The CJR model financially rewards participant hospitals for reducing episode payments and improving quality, which hospitals may achieve by coordinating care with the surgeons, PAC providers, clinicians, and other providers involved in the episode. Prior to the start of each performance year, CMS provides participant hospitals with separate target prices for LEJR episodes based on Medicare Severity Diagnosis Related Groups (MS DRG) and hip fracture status. All providers furnishing care to patients in LEJR episodes are paid under the Medicare fee for service (FFS) system throughout the year. Following the end of a model performance year,

actual total spending for the episode is calculated and compared to the target price. Depending on the participant hospital's quality and payment performance, the hospital may receive an additional payment from Medicare (i.e., reconciliation payment) or be required to repay Medicare (i.e., repayment) for a portion of the episode spending.

The CJR model originally required hospitals in 67 markets, defined by metropolitan statistical areas (MSAs), to participate. Because of the CJR model's mandatory and randomized design, a spectrum of hospitals with varying levels of infrastructure, care redesign experience, episode costs, utilization, and market positions participated, which allowed a broad test of the CJR model. In the third performance year, beginning January 2018, CMS scaled back the number of mandatory MSAs to 34 MSAs with the highest average historical episode payments. Hospitals in these mandatory MSAs that were not designated as low-volume or rural were required to continue their participation in the CJR model (mandatory CJR hospitals). Hospitals in the 33 MSAs with lower average historical payments (voluntary MSAs) and all hospitals in the 67 MSAs that were designated as low-volume or rural had a one-time opportunity to opt-in to the CJR model for performance years (PYs) 3-5. While this report provides savings impacts for opt-in hospitals, the focus of most analyses is on the 395 mandatory CJR hospitals.

The analyses in this report include episodes that occurred during the COVID-19 pandemic, which was declared a national PHE in March 2020. During the early part of the PHE, CMS provided recommendations to temporarily limit non-essential elective procedures, including elective LEJRs. To provide relief to participant hospitals, CMS adopted the COVID-19 PHE policy to remove downside risk, which extended the existing "extreme and uncontrollable circumstances" policy, originally designed for episodes occurring during natural disasters, to the COVID-19 PHE. For episodes starting between January 31, 2020 and March 31, 2021, CMS capped actual episode payments at the quality-adjusted target price at reconciliation. This means that no episode could exceed its target price and generate repayments to Medicare. Episodes could only generate positive reconciliation payments, weakening the financial incentives under the CJR model (58% of PY5 episodes were initiated during this temporary policy and 17% of PY5 episodes were capped because of it). Furthermore, CMS extended PY5 (January 2020-September 2021) by three quarters to provide participant hospitals additional relief and stability in model operations during the public health emergency. In turn, CMS split PY5 into two reconciliation periods, PY5.1 (January-December 2020) and PY5.2 (January-September 2021), so that hospitals would not experience a significant gap between reconciliation reports which contain important feedback on hospital performance. We adjusted our statistical models to account for the numerous ways the PHE influenced the health care landscape, which likely affected the CJR and control groups differently, by considering patient COVID-19 diagnoses and county-level COVID-19 infection rates in our analyses.

Policy Changes Affecting the Impact of the CJR Model



Results

The CJR model decreased average payments for LEJR episodes at mandatory CJR hospitals in each of the first five performance years, although the impact lessened because of broader changes to Medicare policies that allowed outpatient TKAs in PY3 (2018), outpatient THAs in PY5.1 (2020), and the PHE, which began in PY5.1 (2020). During the first five performance years, average payments for LEJR episodes decreased significantly by \$1,437 more than for the control group, or 4.9% from the CJR baseline.

The consistent decrease in payments is primarily due to reductions in institutional PAC use. Under the CJR model, relatively fewer patients were discharged to an inpatient rehabilitation facility (IRF), more were discharged to a home health agency (HHA), and for patients who received skilled nursing facility (SNF) care, the number of days in the SNF decreased by 2.3 days. These changes in utilization resulted in statistically significant decreases in IRF and SNF payments, which drove the decrease in average episode payments. However, the impact of the CJR model on SNF payments and use, and to a lesser extent, IRF payments and use, diminished over time as both CJR and control hospitals reduced institutional PAC use during the PHE.

Interpreting Impacts

We calculated the impact of the CJR model on payments and quality using a difference-in-differences (DiD) methodology, which subtracts the difference from baseline to intervention for the CJR group from the difference for the control group.

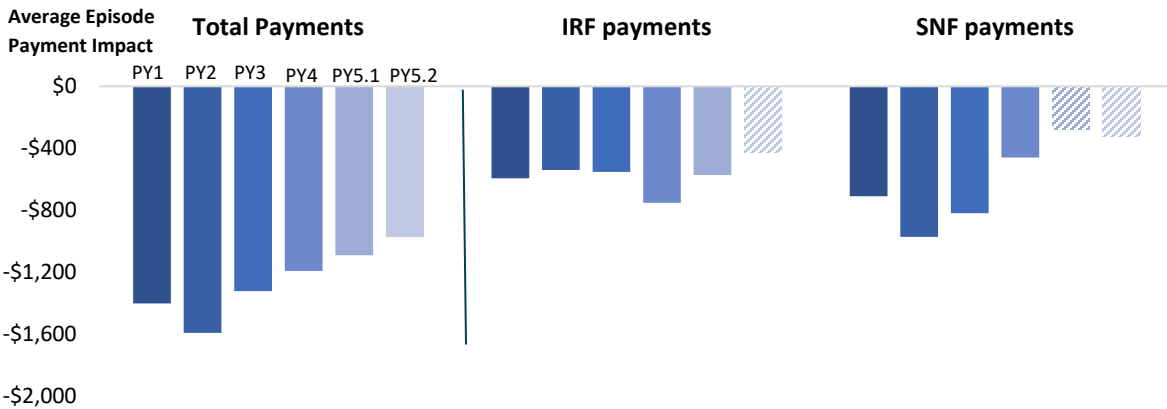
The percent change from the CJR baseline is calculated by dividing the DiD estimate by the CJR baseline average. This value represents the percent change from the CJR baseline that is due to the CJR model.

Baseline refers to a three-year period (2012 through 2014) prior to the CJR model that serves as a benchmark against which performance under the CJR model is compared.

Intervention refers to the period that the CJR model was in effect and studied through our analyses. Except where noted, the intervention period includes the first five performance years of the CJR model (April 2016 through September 2021).

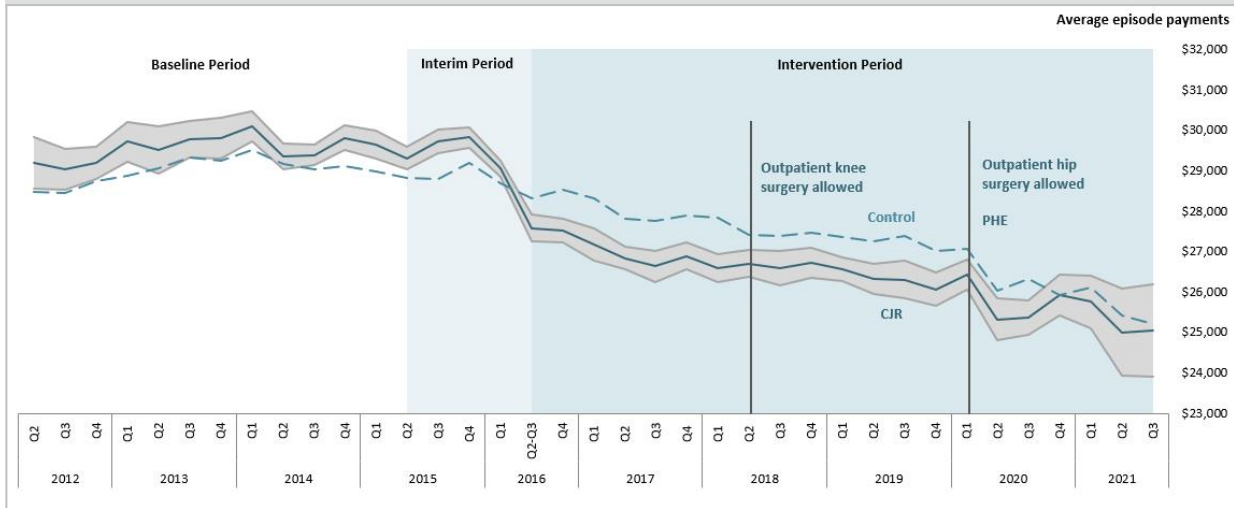
Average Episode Payments is the average sum of Medicare fee-for-service payments for all services and items included in the episode. We define payments as standardized allowed amounts, which include beneficiary cost sharing and do not include wage adjustments and other Medicare payment adjustments.

The CJR model significantly reduced average episode payments due to reductions in payments for post-acute care, specifically by reducing discharges to inpatient rehabilitation facilities and days spent in skilled nursing facilities.



Note: Hashing indicates that the estimated savings is not statistically significant at the 10% level

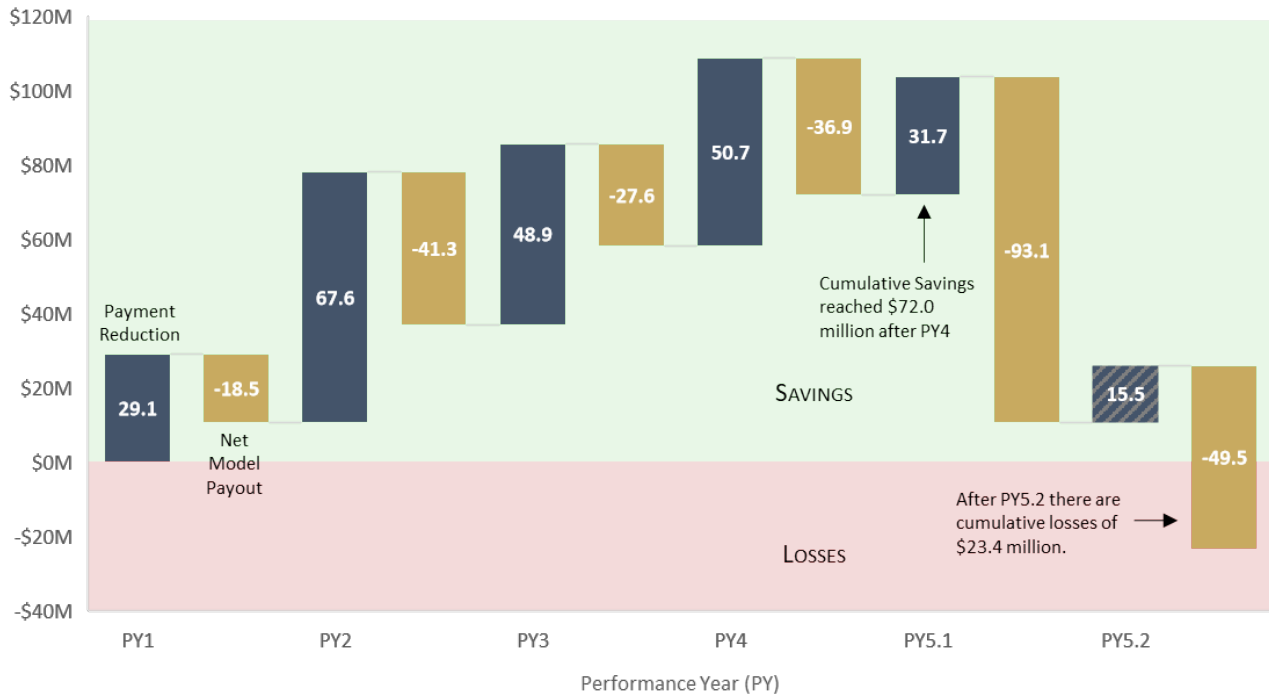
Average episode payments declined more for CJR episodes than control group episodes, although the reduction slowed during the public health emergency.



The COVID-19 PHE policy to remove downside risk for participating hospitals during the pandemic resulted in reconciliation payments being triple what they were in previous years which reversed the savings trajectory for mandatory CJR hospitals. Mandatory CJR hospitals generated \$72.0M in Medicare savings in the first four performance years, although the savings were not statistically significant. In the fifth performance year, mandatory CJR hospitals received larger reconciliation payments under the PHE policy that removed downside risk and, as a result, generated \$95.4M in statistically significant Medicare *losses*. Cumulative Medicare losses from mandatory CJR hospitals were \$23.4M, which were not statistically significant (the estimate ranges from possible losses of \$155.2 million to possible savings of \$108.4 million). Medicare savings is presented as a range because it is based on our statistical analysis of the reduction in payments, which includes a range that is intended to capture uncertainty around our estimate.

Opt-in hospitals generated Medicare losses during the first five performance years. The PHE policy that removed downside risk increased the losses that opt-in hospitals generated in PY5 (2020-2021) but did not change the pattern of losses. Per-episode losses from opt-in hospitals were over 11 times larger than the per-episode losses from mandatory hospitals. Opt-in hospitals generated fewer episodes so total losses from opt-in hospitals were about three times larger than the losses generated by mandatory hospitals. This provides additional evidence that opt-in hospitals stayed in the CJR model because it was financially advantageous.

Mandatory CJR hospitals consistently generated savings until performance year 5, when smaller payment reductions and substantially larger reconciliation payments offset cumulative savings and resulted in losses.



Note: Hashing indicates that the estimated savings is not statistically significant at the 10% level. Performance year 5 was extended by three quarters due to the PHE, creating PY5.1 (January-December 2020) and 5.2 (January-September 2021).

Quality of care, as measured by claims-based indicators, was improved or maintained for mandatory CJR hospitals for patients overall. The CJR model improved the rate of complications following elective LEJRs (elective complication rate), representing a 7.4% decrease from the CJR baseline. The unplanned readmission rate, ED use, and mortality remained unchanged compared to the control group.

In the fourth annual report, our patient survey results raised concerns that the CJR model may be negatively impacting functional recovery for hip fracture patients and creating more reliance on caregivers, so we further investigated the impact of the CJR model on fracture patients. Fracture patients are typically more complex and require more service use than elective patients. Participating hospitals interviewed for the evaluation reported that the emergent and complex nature of fractures made it challenging to effect change for fracture patients. Many employed targeted care redesign approaches for fracture patients, such as using predetermined order sets to get fracture patients into surgery quickly and delaying patient education until after the surgery. Like all LEJR episodes, mandatory CJR hospitals reduced payments for fracture episodes through reductions in institutional PAC use while maintaining quality of care.

In the most recent survey, CJR fracture patients reported similar changes in functional recovery and similar reliance on caregivers as control patients, but CJR fracture patients reported less satisfaction with care management. Using claims data, we studied the period after the episode to investigate any potential longer-term effects of the CJR model. Our exhaustive investigation revealed that the CJR model had little impact on outcomes in the one year following a fracture. We will survey fracture patients again to continue to study their recovery and are cautiously optimistic that the CJR model can reduce payments for fracture episodes without sacrificing quality of care.

Our examination of the impact of the CJR model on health equity revealed large baseline disparities in payments, use, quality, and the elective LEJR rate. We studied three historically underserved populations: patients who are Black or African American (Black), dually eligible for Medicare and Medicaid (dual), or Black *and* dual. Disparities in health care and LEJR rates are well documented in the literature for these populations.¹ Similar to other studies, we found that, during the baseline period, historically underserved populations generally had higher episode payments, used more institutional PAC, had higher rates of ED use and readmissions, and received elective LEJRs at a lower rate than their reference populations. In fact, historically underserved populations had elective LEJR rates that were 40% to 60% lower than their reference populations during the baseline. Because of existing disparities in the elective LEJR rate, patients who are Black, dual, or Black and dual were underrepresented in both the CJR and control groups. The greater complexity and higher service usage for underserved populations could prompt hospitals to provide fewer LEJRs to underserved populations to reduce average episode payments and increase reconciliation payments.

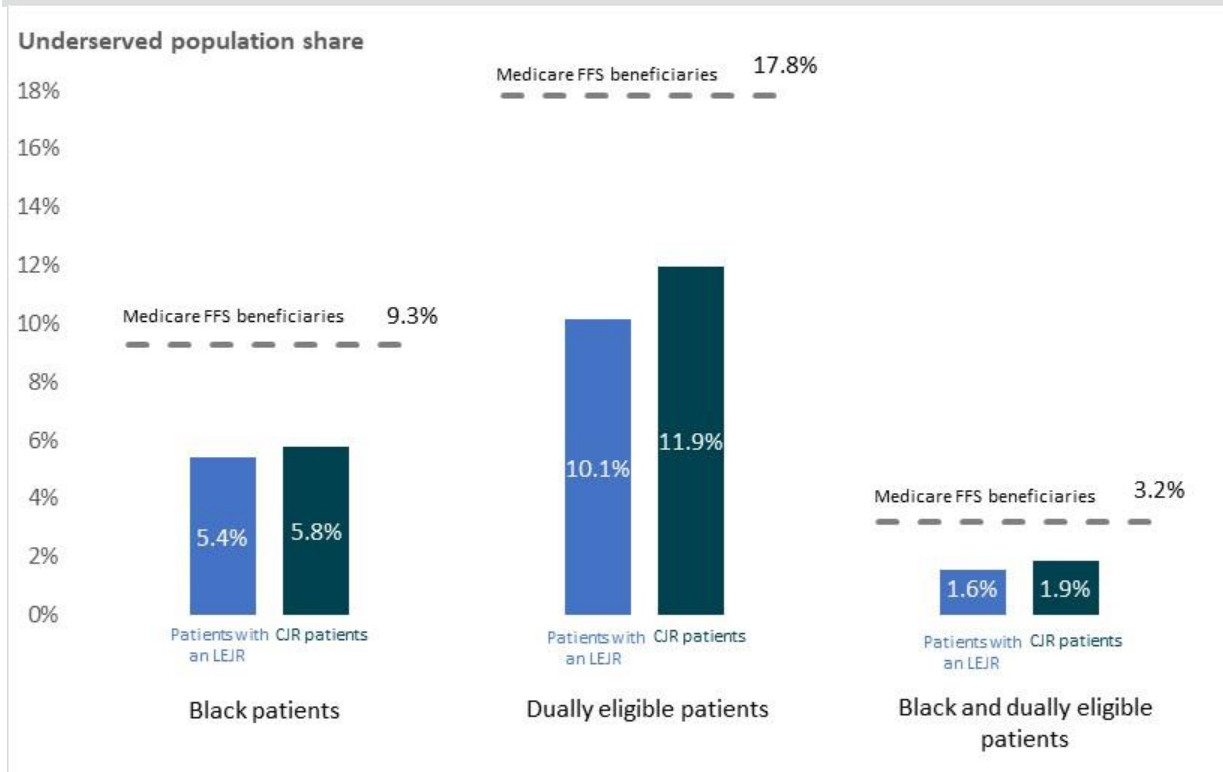
LEJR rates declined in both the CJR and control MSAs for all populations studied. However, while not statistically significant, LEJR rates for underserved populations declined more and LEJR rates for reference populations declined less than the declines of their counterparts in the control group. This caused small but statistically significant widenings of already large disparities in LEJR rates between patients who are Black and patients who are White and between Black duals and White nonduals. In the baseline, the LEJR rate for patients who are Black was 42% lower than the LEJR rate for patients who are White, rising to 45% in the performance period of the model. In the baseline, the LEJR rate for Black duals was 58% lower than the LEJR rate for White nonduals, rising to 64% in the performance period of the model. These findings, despite being small in magnitude, are concerning because lack of access to LEJRs is associated with reduced quality-adjusted life years.² The CJR model extension, beginning with PY6 (October 2021- December 2022), includes additional episode-level risk adjustment (age, hierarchical condition category [HCC] count, and dual eligibility status) that

¹ Alvarez PM, McKeon JF, Spitzer AI, Krueger CA, Pigott M, Li M, Vajapey SP. Race, utilization, and outcomes in total hip and knee arthroplasty: a systematic review on health-care disparities. *JBJS Rev* 2022;10(3): e21.00161. doi: 10.2106/JBJS.RVW.21.00161. PMID: 35231001.

² Kerman HM, Smith SR, Smith KC, Collins JE, Suter LG, Katz JN, Losina E. Disparities in Total Knee Replacement: Population Losses in Quality-Adjusted Life-Years Due to Differential Offer, Acceptance, and Complication Rates for African Americans. *Arthritis Care Res (Hoboken)*. 2018 Sep;70(9):1326-1334. doi: 10.1002/acr.23484. Epub 2018 Aug 16. PMID: 29363280; PMCID: PMC6057850.

could increase LEJR rates for patients who are likely to require more resources and be costlier to treat.³

Lower representation of underserved populations in the CJR model is due to existing disparities in the rate of joint replacements for these populations in the Medicare fee for service population.



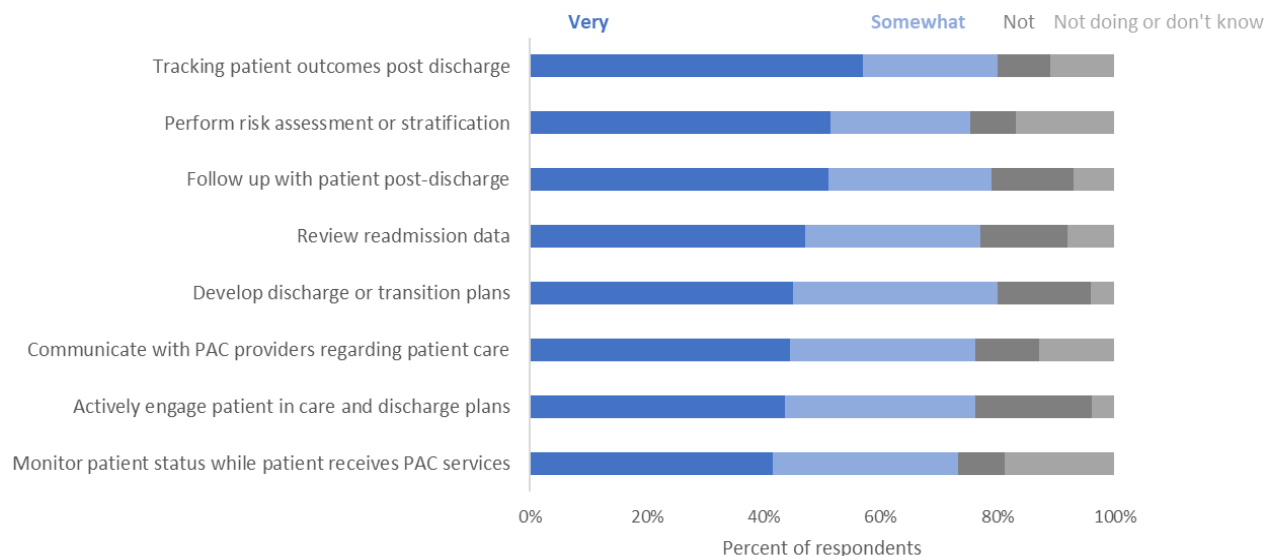
The CJR model reduced episode payments for the three underserved populations and their reference populations, relative to their counterparts in the control group. The reductions in average episode payments were larger for underserved populations than for their reference populations, narrowing baseline payment gaps; however, the differential impact for Black and White patients was the only one that was statistically significant. The CJR model decreased average episode payments by \$1,023 (p=0.06) more for Black patients than for White patients. CJR hospitals generally used the same levers to reduce LEJR episode payments for historically underserved populations that they used for other patient populations. Namely, for patients who are Black, dual, or Black *and* dual, CJR hospitals reduced the use of institutional PAC and increased the proportion of patients discharged from the hospital to an HHA. The CJR model improved the mortality rate for Black patients, widening the baseline gap that was already favorable to Black patients. The CJR model did not change any other quality of care metrics for underserved populations, maintaining baseline disparities in quality.

³ Centers for Medicare & Medicaid Services. Medicare Program: Comprehensive Care for Joint Replacement Model Three-Year Extension and Changes to Episode Definition and Pricing; Medicare and Medicaid Programs; Policies and Regulatory Revisions in Response to the COVID-19 Public Health Emergency; Final Rule 2021:1-81.

The evaluation examined whether the CJR model resulted in any unintended consequences. For example, CJR participant hospitals could delay services until after the end of the episode to keep episode payments low or favor less complex patients who may be less costly to treat. A reduction in complexity could help mandatory CJR hospitals meet payment and quality targets and receive larger reconciliation payments. We did not find evidence that mandatory CJR hospitals were shifting care outside the episode. However, for the highest volume and least complex episode group, elective LEJRs without major complications or comorbidities, we saw a decline in patient complexity for mandatory CJR hospitals relative to the control group. Specifically, CJR patients were relatively less likely to be eligible for Medicaid, have prior SNF utilization, or have any prior care. During the CJR model extension, CMS is implementing additional episode-level risk adjustment.

In PY5.1 (2020), we surveyed care coordinators at CJR participant hospitals to understand their hospitals’ care coordination efforts in response to the CJR model. Respondents reported that their hospitals invested in care coordination to achieve the goals of the CJR model, and 41% of the care coordinators surveyed said they were hired or assigned to perform additional care coordination activities because of the CJR model. Over 70% of care coordinator survey respondents stated that the CJR model influenced key care coordination strategies across the care continuum, including: developing discharge plans, engaging patients in development of care and discharge plans, following-up with patients, tracking patient outcomes post-discharge, and communicating with PAC providers regarding patient care. Also, more than 80% of care coordinators reported their hospitals measure the success of their care coordination strategies through metrics, including: readmissions, discharge destination, length of hospital stay, patient satisfaction, and complications or infections.

Over 70% of care coordinator survey respondents stated that the CJR model influenced key care coordination strategies across the care continuum.



Discussion

This fifth annual evaluation report demonstrates that the CJR model, which holds hospitals accountable for payments and quality for an episode of care that begins with LEJR surgery, is a promising approach for reducing episode payments. Through the fifth year of the model, participating hospitals continued to respond to its financial incentives by reducing the use of institutional PAC, resulting in relative reductions in episode payments, although reductions slowed due to the outpatient policy changes and the PHE. Quality of care was maintained or improved for all LEJR patients at mandatory hospitals. In the most recent patient survey, CJR hip fracture patients reported similar levels of functional recovery to control hip fracture patients, which differs from prior survey waves in which CJR fracture patients self-reported worse functional recovery than control patients. Past results may have been an anomaly or reflected a real but transitory negative impact for CJR fracture patients. However, LEJR patients with fractures reported lower satisfaction with care management and were less likely to report that they had all of the medical equipment they felt they needed at home, relative to control survey respondents. We found that underserved populations had large disparities in the elective LEJR rate and quality, as measured by rates of ED use and readmissions, during the baseline. The elective LEJR rates in the reference populations were twice the elective LEJR rates in the underserved populations. Under the model, the mortality rate improved for Black patients. Otherwise, there were no changes in quality of care for underserved populations under the model. The CJR model increased the LEJR rate disparity between Black and White patients and between Black duals and White nonduals. At the implementation of the CJR model, there were concerns that the model would lower quality and reduce LEJR rates for underserved populations.⁴ The evaluation found that these negative unintended consequences did not occur. However, the evaluation also found that the CJR model did not reduce disparities in LEJR rates and quality, and these results suggest that models will not reduce health care disparities unless explicitly designed to do so.

In the first four performance years, mandatory hospitals generated \$72 million dollars in savings to Medicare. But in PY5, reconciliation payments substantially increased, due to a generous COVID-19 relief policy. This generous relief policy resulted in reconciliation payments being triple what they were in previous years, which reversed the savings trajectory and resulted in statistically significant losses to Medicare for mandatory hospitals. The losses in PY5 were large enough to offset total estimated savings prior to the PHE. After March 2021, CMS implemented a more fiscally conservative public health emergency relief policy, removing downside risk only for episodes with a COVID diagnosis, which likely will reduce reconciliation payments in future performance years.

In future reports, we will evaluate how hospitals respond to the three-year extension of the CJR model, which will include outpatient LEJRs as episodes. Site neutral target pricing could

⁴ Ibrahim SA, Kim H, McConnell KJ. The CMS Comprehensive Care Model and Racial Disparity in Joint Replacement. *JAMA*. 2016 Sep 27;316(12):1258-9. doi: 10.1001/jama.2016.12330. PMID: 27653166; PMCID: PMC5549782.

increase the share of CJR LEJRs in the hospital outpatient setting, which could lower payments and increase savings under the model. Alternatively, as the outpatient share of LEJRs increases for both CJR and control hospitals, it may be harder for CJR hospitals to reduce episode costs (relative to control hospitals) by reducing the use of institutional PAC. We will assess whether payment reductions rebound as the COVID-19 pandemic subsides and decompose payment impacts into those attributable to increases in the outpatient LEJR share and those attributable to decreases in institutional PAC use following an inpatient LEJR. We will continue to study the impact of the model on hip fracture patients. Future reports will include updated survey results on functional recovery, satisfaction, and quality of care for this population. We will evaluate the impact of the CJR model extension on underserved populations and assess the model's impact on access under its new risk adjustment methodology.

For more information about this model and to download the 5th annual evaluation report, visit <https://innovation.cms.gov/initiatives/cjr>.