

CMS Comprehensive Care for Joint Replacement Model: Performance Years 6–8 Evaluation Report

Final Evaluation Report



September 2026

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

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Acknowledgments

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This project was funded by the Centers for Medicare & Medicaid Services (CMS) under contract no. HHSM-500-2014-00033I. The statements contained in this report are solely those of the authors and do not necessarily reflect the views or policies of CMS. The Lewin Group assumes responsibility for the accuracy and completeness of the information contained in this report.

This Word document was converted to a 508 PDF using CommonLook Office software (ver. 2.1.23.55). We also used CommonLook PDF software (ver. 5.20 32-bit) to make sure all tags were correct once the 508 PDF was created. The 508 PDF was checked for Accessibility with Adobe Acrobat Pro (ver. 26.001.21662).

Table of Contents

I. Introduction	1
CJR Model Features.....	3
CJR Evaluation Framework.....	8
II. Overview of the CJR Population	10
Volume of LEJR Episodes During the Extension Period	10
Regional Distribution and Patient Characteristics.....	12
III. Impact of the Model	16
Impact of the CJR Model on Elective Episodes.....	17
Impact of the CJR Model on Fracture Episodes	22
Impact of the CJR Model on All Episodes	26
IV. Medicare Program Savings.....	28
Net Medicare Savings in the CJR Extension Period.....	29
Net Medicare Savings per Episode	31
Hospital Net Reconciliation Payments.....	33
V. Discussion and Conclusion	36
Summary of Findings.....	36
Considerations.....	36
Conclusion	39

I. Introduction

Lower extremity joint replacements (LEJRs) for hips and knees are among the most frequent surgeries Medicare patients receive and often mark the beginning of a complex recovery process.^{1,2} Patients frequently require rehabilitation services, physical and occupational therapy, and skilled nursing after receiving an LEJR. Effective care planning and coordination can help ensure appropriate use of these services, potentially reducing unnecessary post-acute care (PAC) utilization and associated costs. Recognizing these challenges, the Centers for Medicare & Medicaid Services (CMS) implemented the Comprehensive Care for Joint Replacement (CJR) Model from April 2016 through December 2024 as part of its broader strategy to test episode-based payment models that reward value over volume.



Key Points

CJR Model Goals	Key Model Components	Financial Responsibilities
- Tested whether an episode-based payment model for LEJRs could lower payments while maintaining or improving quality - Encouraged hospitals to provide a safe, effective, and positive recovery experience free from complications while maintaining patients' freedom of choice in providers and services	- Required mandatory participation of hospitals in selected MSAs, with a focus on markets with higher LEJR spending during the extension period - Incentivized hospitals to work with physicians and post-acute care providers to improve the quality and coordination of care from the surgery through recovery	- Held hospitals financially accountable for the cost of the surgery and health care services for the following 90 days - Used a target pricing approach to determine whether the hospital received a reconciliation payment or owed a repayment to Medicare



Evaluation Primary Research Questions

1. Was the CJR Model associated with Medicare program savings through reductions in expenditures and care transformation?
2. Did the model improve or maintain quality of care?

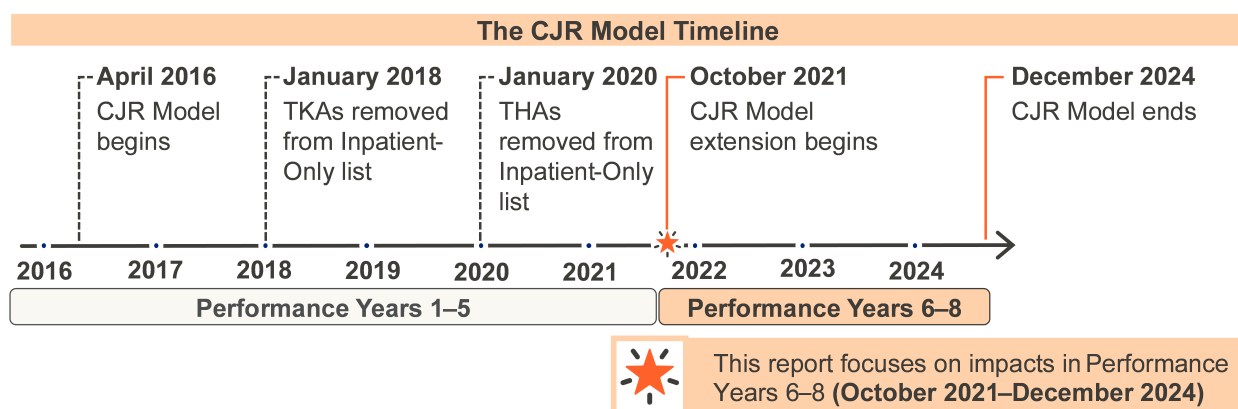
The CJR Model required hospitals in selected metropolitan statistical areas (MSAs) to be accountable for the cost and quality of LEJR care, beginning with an admission for an LEJR surgery and ending 90 days following discharge. CMS set a spending goal for each episode, referred to as a target price, which provided a financial incentive to hospitals to control spending. Hospitals were responsible for achieving these spending targets. A hospital could receive an additional payment if spending was below its target price or could have to pay back Medicare if

¹ Inpatient Total Ankle Arthroplasties are also included in the CJR Model but only represent less than 0.2% of total CJR episodes in the extension period.

² A full list of acronyms and definitions is in **Appendix A: List of Acronyms and Glossary of Terms**.

spending was above its target price. Over time, the model shifted to focus on hospitals in markets with higher historical episode spending, where opportunities for savings could be greater.

In 2021, CMS extended the CJR Model for 3 additional performance years (PYs) (PY 6–PY 8), referred to in this report as the “extension period.” The extension period introduced important design changes. CMS updated target pricing and included outpatient (OP) total knee arthroplasties (TKAs) and total hip arthroplasties (THAs) to better align the model with changes in Medicare payment policies and evolving practice patterns. This report focuses on the evaluation of CJR during the extension period, examining impacts after major revisions to the model’s design. The timeline below provides an overview of the CJR Model milestones and the key policy changes discussed in this chapter.



We estimated that the CJR Model saved approximately \$180 million (M) for Medicare during the extension period, driven by a reduction in elective episode expenditures that may have stemmed from more efficient care processes, as well as repayments from hospitals that did not achieve target spending. Quality of care was largely maintained during the model as hospitals improved care coordination and care plans, and patients retained their freedom of choice in providers and services.

The purpose of this evaluation report is to provide insights into how the CJR Model added value to Medicare and drove hospital-led care transformation that lowered costs. The Lewin Group, in partnership with GDIT and Telligent, conducted an independent evaluation of the CJR Model under contract with CMS to assess whether the model changed spending and quality patterns for LEJRs. We hypothesized that participants would generate savings to Medicare by redesigning care in response to model goals while maintaining or improving patient outcomes throughout the episode. We anticipated the model would encourage providers across care settings to collaborate on discharge planning to



Report Summaries

Please refer to the following resources under the *Evaluation Reports* section of the [CJR Model website](#) for an overview of findings:

- **Findings at a Glance | 2 pages**
Concise visual summary of key findings
- **Executive Summary | 5 pages**
High-level snapshot of the model, evaluation methods, and results

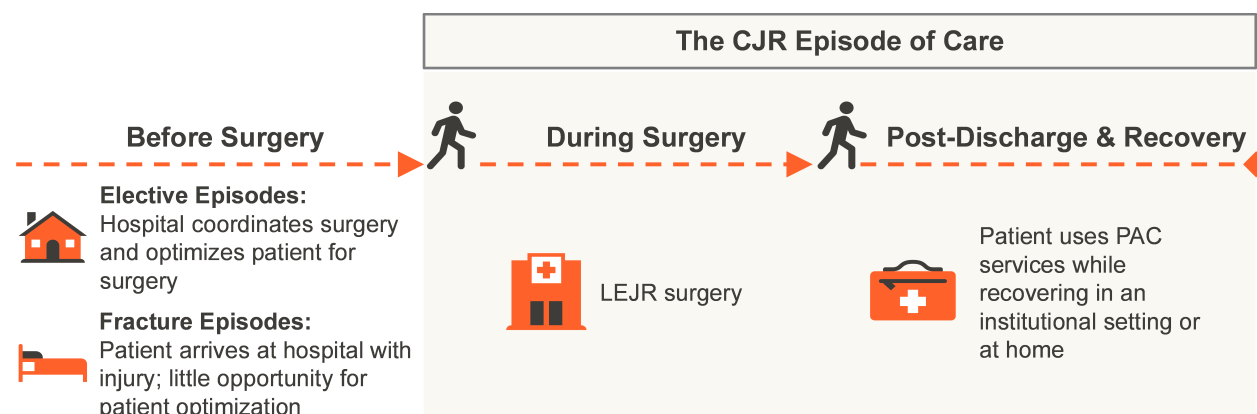
contain costs and maintain quality of care, as well as increase patient and caregiver support to improve outcomes. Specifically, we expected that model participants would reduce cost drivers, such as readmissions and stays in PAC facilities, and increase discharges directly home.³

CJR Model Features

The CJR Model's design, including its episode of care structure, participation requirements, and pricing mechanism, encouraged participants to lower Medicare payments while maintaining or improving quality of care.

1. The LEJR Care Pathway

Under the CJR Model, an episode of care began with an inpatient admission or OP procedure for an LEJR surgery for an eligible Medicare fee-for-service (FFS) patient and included related care for 90 days. This 90-day post-discharge and recovery period began with the date of discharge for inpatient procedures or the date of surgery for OP procedures. The episode bundle included all LEJR-related Medicare Part A- and Part B-covered care, services, and equipment provided during the episode, including any PAC services.



During the 90-day post-discharge and recovery period, patients may have been discharged to a PAC setting or received PAC services at home (**Exhibit I-1**). Hospitals discharged patients to one of three locations: inpatient rehabilitation facilities (IRFs), skilled nursing facilities (SNFs), or home. Patients discharged home may receive home health (HH), OP physical therapy (PT), or OP occupational therapy (OT), as directed by a physician.

³ For evaluation reports of earlier PYs used to inform these hypotheses, please see the [CMS CJR Model web page](#).

Exhibit I-1: The LEJR post-discharge and recovery care settings**Post-Discharge & Recovery****1****Inpatient Rehabilitation Facility (\$\$\$)**

IRF care involves at least 15 hours per week of intensive and multi-disciplinary therapy under the supervision of a rehabilitation physician. IRF stays are generally shorter than SNF stays and are paid per discharge.

2**Skilled Nursing Facility (\$\$)**

SNF care provides daily skilled nursing or rehabilitation services and is paid on a per-diem basis, with spending that varies by length of stay and case-mix classifications that reflect patients' expected resource needs. Under the CJR Model, hospitals may have used the SNF 3-day rule waiver, allowing eligible beneficiaries to receive SNF care without a qualifying 3-day inpatient hospital stay.

3**Home Health (\$)**

HH care is available following both inpatient and outpatient LEJRs and is paid under an episode-based prospective payment system. HH services can provide skilled nursing care, PT, OT, medical social work services, HH aide services, and telehealth services. Patients were not required to meet homebound criteria to qualify for HH care under the CJR Model flexibilities.

4**Physical and Occupational Therapy (\$)**

PT and OT services in OP settings, such as hospital OP departments and rehabilitation clinics, are available following both inpatient and outpatient LEJRs and are paid per visit with spending tied to the volume of therapy services used.

Notes: The dollar sign symbol (\$) indicates relative cost, with one dollar sign representing the lowest relative cost and three dollar signs representing the highest.

CJR = Comprehensive Care for Joint Replacement; CMS = Centers for Medicare & Medicaid Services; HH = home health; IRF = inpatient rehabilitation facility; LEJR = lower extremity joint replacement; OT = occupational therapy; PT = physical therapy; SNF = skilled nursing facility.

Source: Center for Medicare Advocacy [Quick Guide to Inpatient Rehab Hospital Coverage](#). CMS Medicare [Inpatient Rehabilitation Facility Prospective Payment System \(IRF PPS\) Coverage Requirements](#). CMS Medicare Learning Network [Skilled Nursing Facility 3-Day Rule Billing Fact Sheet](#). CMS [Skilled Nursing Facility PPS](#) web page. CMS [Patient Driven Payment Model](#) web page. HealthCompare Insurance Services Medicare.org web page [Does Medicare Pay for Rehab?](#). Medicare Learning Network [Medicare Payment Systems](#). CJR Extension [Provider and Technical Fact Sheet](#). MedPAC Payment Basics [Inpatient Rehabilitation Facilities Payment System](#). [Comparison of Patients Discharged to Skilled Nursing and Inpatient Rehabilitation Facilities After Hospitalization for COVID-19](#). MedPAC Payment Basics [Home Health Care Services Payment System](#). [CMS 2025-14679 \(90 FR 37310\)](#). MedPAC Payment Basics [Skilled Nursing Facility Services Payment System](#).

The CJR Model held hospitals responsible for both elective LEJRs and fractures, which follow distinct pathways. Hospitals can schedule and plan for elective LEJR surgeries, which allows providers to prepare patients for a smoother recovery after surgery. Hospitals have less discretion for fractures because these are often emergent, unplanned procedures.⁴ Additional considerations may also be needed for episodes with a major complication or comorbidity (MCC).

Beginning in the extension period, CMS included hip and knee replacements performed in an OP setting as eligible CJR episodes of care to address the removal of TKA and THA from the Medicare Inpatient-Only list.⁵ We examine OP LEJR rates for CJR and control hospitals in [Chapter II: Overview of the CJR Population](#).



Eligible CJR Episode Billing Codes

Four MS-DRGs identify qualifying surgeries:

Elective episodes

1. **MS-DRG 469:** Major Hip and Knee Joint Replacement or Reattachment of Lower Extremity with MCC or Total Ankle Replacement
2. **MS-DRG 470:** Major Hip and Knee Replacement or Reattachment of Lower Extremity without MCC
 - **Outpatient procedures** under CPT codes 27447 TKA and 27130 THA are grouped with MS-DRG 470 for target pricing and reconciliation

Fracture episodes

1. **MS-DRG 521:** Hip Replacement with Principal Diagnosis of Hip Fracture with MCC
2. **MS-DRG 522:** Hip Replacement with Principal Diagnosis of Hip Fracture without MCC

CMS did not include LEJRs performed at ambulatory surgery centers (ASCs) in the CJR Model, so all measures in this report exclude LEJR procedures performed at an ASC. Across the extension period, fewer than 10% of LEJRs occurred in ASCs in both CJR and control MSAs, though the share of LEJRs in ASCs continued to increase slowly but steadily over time.

2. Participants

The start of the CJR extension period in PY 6 marked a return to fully mandatory participation. Prior to the extension period, in PY 3–PY 5, CMS allowed hospitals in markets with lower historical spending and hospitals designated as low-volume or rural in markets with higher historical spending to voluntarily participate. During the extension period, all hospitals paid under the Medicare Inpatient Prospective Payment System (IPPS) were required to participate if they were located in 1 of the 34 randomly selected MSAs in high-cost markets, with the exception of hospitals designated as low-volume or rural.

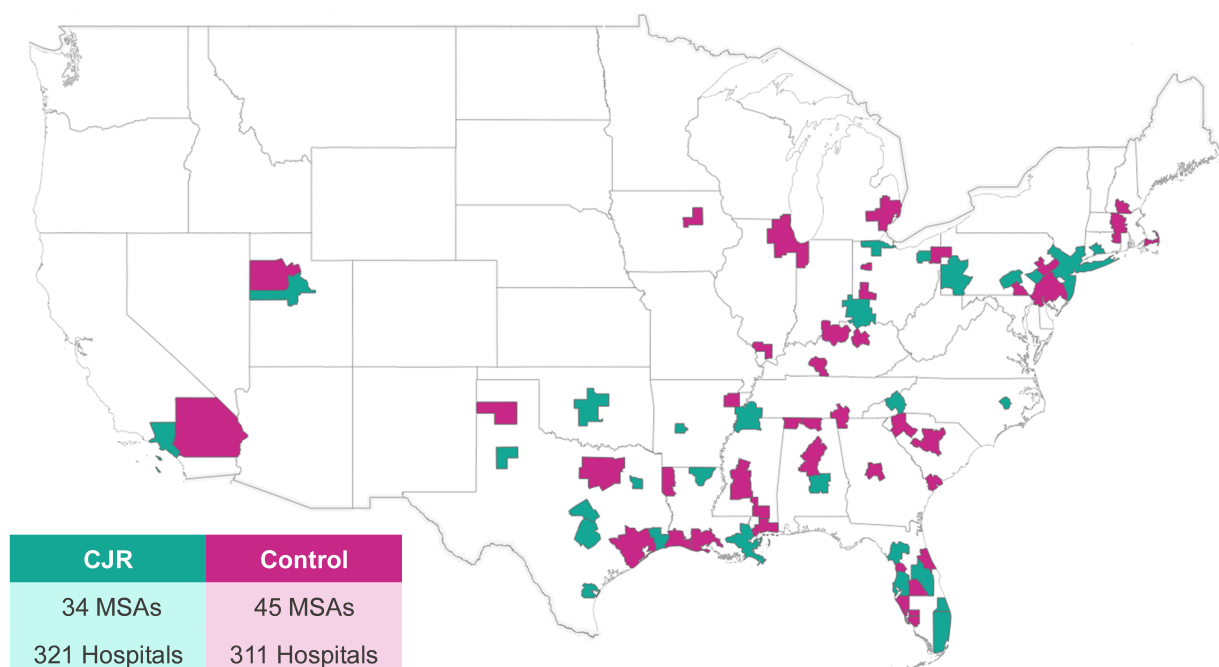
A total of 321 hospitals participated in the CJR Model during the extension period. For this evaluation, we compared participant hospitals with 311 control hospitals to estimate the model's

⁴ Throughout this report, the term “fracture episodes” is used as shorthand for MS-DRG 521 and MS-DRG 522. These MS-DRGs only include hip fractures, and fractures of the knee or ankle are included in elective episode counts.

⁵ [Medicare Program: Comprehensive Care for Joint Replacement Model Three-Year Extension and Changes to Episode Definition and Pricing, 85 Fed. Reg. 10516](#) (May 3, 2021) (codified at 42 most recent 510).

impact. Our control group was drawn from 45 MSAs that met the same eligibility criteria applied to CJR participants but were not selected during randomization. We included control hospitals if they were eligible and located in one of these non-selected MSAs. (**Exhibit I-2**).

Exhibit I-2: The CJR evaluation compared hospitals in randomly selected MSAs with hospitals in eligible but non-selected MSAs



Notes: Alaska, Hawaii, and Puerto Rico did not have any CJR or control MSAs. The map displays only MSAs with at least one hospital who effectively participated (had at least one LEJR episode included in the model during the extension period). After excluding MSAs without participating hospitals, there are 29 CJR MSAs and 41 control MSAs.

CFR = Code of Federal Regulations; CJR = Comprehensive Care for Joint Replacement; FR = Federal Register; MSA = metropolitan statistical area.

Source: CJR evaluation team analysis of hospital enrollment data and the CMS Final Rule Medicare program: Comprehensive Care for Joint Replacement Model 3-Year Extension and Changes to Episode Definition and Pricing, 85 FR 10516, published May 3, 2021 (codified at 42 CFR 510).

3. Pricing

The CJR Model was a retrospective bundled payment model where CMS provided participants with a preliminary target price for the episode bundle for each of the four Medicare Severity-Related Groups (MS-DRGs) included in the model. CMS paid providers and suppliers for services furnished during LEJR episodes of care under the Medicare FFS payment system and then reconciled the difference between actual spending and the target price at the end of the PY. Target prices in the extension period included



What Is a Target Price?

CMS provided each CJR hospital with a regional standardized preliminary target price for each MS-DRG before each PY. The target prices represented the average spending within that hospital's region for each of the four MS-DRGs in the CJR Model based on historical spending data, with a 3% discount applied. The 3% discount represented savings to Medicare.

episode-level risk adjustment to account for patient factors that could affect spending. The extension period also used site-neutral pricing for the most common type of elective episodes, assigning a common target price across procedures performed in the inpatient (IP) or OP setting.⁶

CMS added or modified several pricing features during the extension period:

- **Preliminary target prices.** CMS based preliminary target prices on the most recent year of historical claims data, rather than 3 years, to better capture spending patterns associated with newly included OP procedures and other recent care delivery and utilization trends.
- **Risk adjustment.** CMS added episode-level risk-adjustment for patient age, dual-eligibility status, and count of Hierarchical Condition Categories (HCCs) to target pricing calculations.
- **Retrospective market trend adjustment.** CMS applied a retrospective market trend factor to reflect regional changes in episode spending.
- **Quality discounts.** To better incentivize high-quality care, CMS increased hospitals' ability to reduce the CMS discount applied to their target price, lowering potential repayments to CMS or increasing payments from CMS to hospitals with higher quality.
- **High-cost episode spending caps.** CMS updated the methodology to cap high-cost episodes at the 99th percentile amount within each region/MS-DRG combination.

After the end of a model PY, CMS added the total spending for all the episodes each hospital performed under each MS-DRG and compared it to the hospital's target price for that MS-DRG, a process referred to as annual reconciliation.



Annual Reconciliation

$$\left(\text{Hospital-Specific Target Price} \right) - \left(\text{Actual Spending From LEJR Episodes} \right) = \text{Annual Reconciliation Amount}$$

After the end of each PY, CMS adjusted the target price based on a hospital's composite quality score—a summary score reflecting hospital performance and improvement on two LEJR-related quality measures. CMS then reconciled each participant hospital's LEJR episode payments against its quality-adjusted target price. Depending on the hospital's quality and episode spending performance, it received an additional payment from CMS or was required to repay CMS for a portion of the episode spending.

⁶ Throughout this report, the term “elective episodes” is used as shorthand for MS-DRG 469, MS-DRG 470, and OP LEJRs. Site-neutral target pricing includes MS-DRG 470 (without MCCs) and OP LEJRs. Site-neutral target pricing excludes MS-DRG 469 which makes up a small number of elective inpatient episodes.

Under the CJR Model, hospitals whose episode spending fell below their target price were required to achieve a minimum level of episode quality in order to receive reconciliation payments. Higher episode quality may also have led a hospital to receive a higher reconciliation payment or to have less repayment responsibility at reconciliation. A more detailed discussion of target pricing and reconciliation is available in [Chapter IV: Medicare Program Savings](#).

CJR Evaluation Framework

For this evaluation, we used a difference-in-differences (DiD) methodology with a control group to assess the CJR Model's impact on payment, utilization, and quality outcomes. Our selection of the control group leveraged the original randomization of MSAs to CJR and control groups.

We examined the following measures to determine the model's impact:

- Total episode payments and relevant components, including initial hospitalization or procedure (known as the “anchor”); payment for common PAC settings, including SNF, IRF, and HH; payment for any readmission; and any other Part A or Part B payment
- Discharges to and length of stay at common PAC settings, including SNF, IRF, and home with HH, PT, or OT services
- Rates of unplanned readmission, emergency department (ED) use, complications, and mortality

We analyzed outcomes during the extension period (PY 6–PY 8) relative to the baseline period (April 2012–March 2015, prior to CJR implementation) using descriptive and regression-based techniques.⁷ In addition to DiD, we applied difference-in-difference-in-differences (DDD) analyses to examine the model's impact on patients who were dually eligible for Medicare and Medicaid compared with those who were not.

The evaluation analyzed all LEJRs together as well as elective and fracture surgeries separately to better understand how the model affected these distinct care pathways. A detailed discussion of the CJR Model's impact is available in [Chapter III: Impact of the Model](#).

In addition to estimating impacts on episode spending, we combined these estimates with reconciliation payment data to calculate savings to Medicare, both overall and per episode of care. Refer to **Appendix B: Data and Methods** for more information on the evaluation approach and methodology used to estimate CJR Model impacts.



Data Sources

We used Medicare claims, payment, and enrollment data, as well as CJR programmatic data and IPPS Final Rule specifications, to evaluate the model's impact in this report.

⁷ The PY 8-specific impacts, which included episodes that ended between January 1, 2024, and December 31, 2024, are reported separately in **Appendix D: Additional Findings**.



Care Transformation Insights

Our findings from previous evaluation reports suggested that CJR hospitals responded to the bundled payment incentives by reducing unnecessary care and engaging patients so they could be well informed and physically prepared for surgery and recovery. Hospitals developed more pre-surgery education programs and prescribed physical therapy before and after surgery. They also revised post-discharge strategies and strengthened provider relationships to reduce institutional stays and get patients home sooner after their surgery.

Throughout CJR, the evaluation team assessed hospital experiences with care redesign through a variety of primary data collection activities, including:

- **Site visits:** In-person visits to CJR hospitals
- **Telephone interviews:** Nine rounds of interviews with CJR hospitals and SNFs
- **Provider surveys:** Three rounds of surveys with hospitals, surgeons, and care coordinators
- **Clinical review panel:** Ten meetings of a panel with surgeons, nurses, and physical therapists

Interested in learning more?

A detailed discussion of how and why hospitals transformed care under the CJR Model is available in our [Drivers of Care Transformation report](#).

The following chapters provide detailed evaluation findings and insights:

- [Chapter II](#): Overview of the CJR Population
- [Chapter III](#): CJR Model Impacts
- [Chapter IV](#): Medicare Program Savings

Finally, in [Chapter V](#), we summarize findings and considerations. We conclude that the CJR Model achieved program savings of \$180 M while maintaining quality of care, providing robust evidence in support of model expansion.

II. Overview of the CJR Population

CMS designed the CJR Model to engage a broad set of hospitals through mandatory participation and a geographically based approach. During the CJR extension period (October 2021–December 2024), CMS identified the MSAs with the highest historical episode spending among those originally randomly selected for the model and required hospitals in those MSAs to participate, unless they met rural or low-volume exclusion criteria. The population of LEJR episodes included during the extension period was shaped by these participation and eligibility rules, as well as by trends in LEJR care. Over this period, LEJR care rapidly changed in the United States, driven by advances in surgical techniques, expanded OP capability, and shifting patterns of PAC utilization.



Key Points

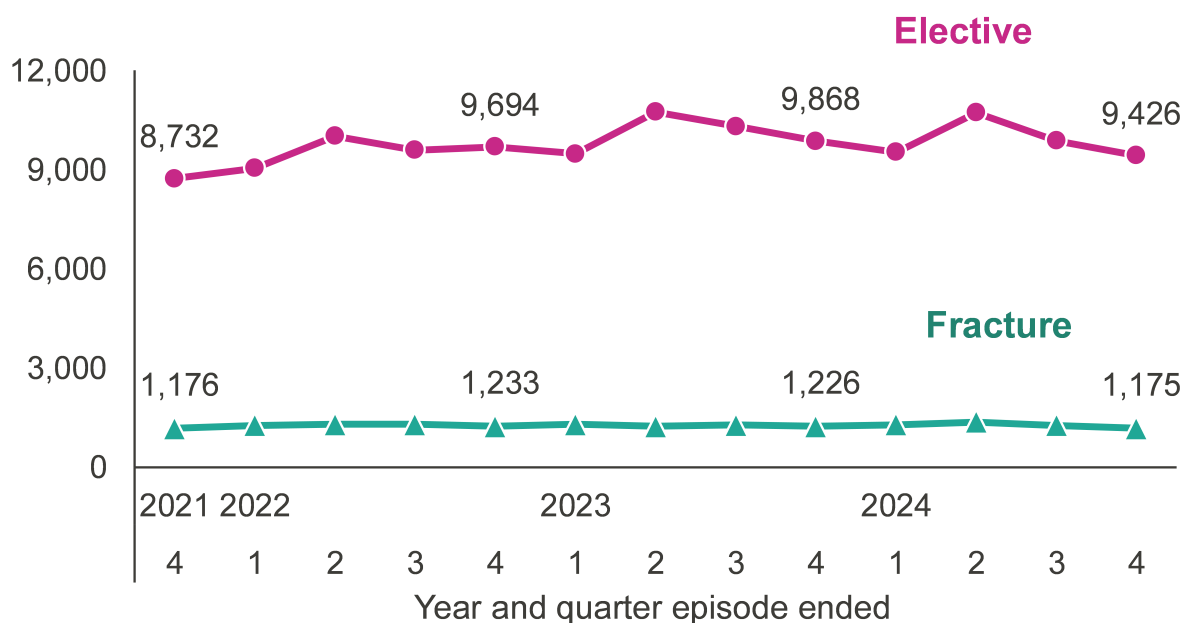
Volume of LEJR Episodes	LEJR Regional Distribution	CJR Patient Characteristics
- CJR elective LEJR volume rose roughly 8% from 2021 to 2024, while fracture volume remained stable - Nearly three-quarters of elective LEJRs during the extension period occurred in hospital outpatient settings	CJR episodes were concentrated in urban areas, reflecting the model's MSA-based design	Though several patient and episode characteristics differed, highlighting the importance of risk adjustment in evaluating model effects, CJR and control populations shared broad similarities

This chapter describes the LEJR population treated in CJR hospitals during the extension period. We examine trends in surgical volume, the regional distribution of episodes, and the demographic and clinical characteristics of patients. This chapter also situates this population relative to both the national Medicare LEJR population and the evaluation control hospitals, providing the context necessary for interpreting spending, utilization, and quality outcomes in subsequent chapters.

Volume of LEJR Episodes During the Extension Period

Between PY 6 and PY 8, the volume of elective episodes for Original Medicare patients at CJR hospitals increased slightly, rising from 8,732 in Quarter 4 (Q4) 2021 to 9,426 in Q4 2024 (**Exhibit II-1**). Many factors could have contributed to that trend, including growing patient demand for LEJRs, hospital capacity to perform the procedures, and shifts in payer mix for the hospitals' patient populations. Fracture LEJR volumes are less subject to these factors and remained stable during the same period, averaging between 1,150 and 1,300 procedures per quarter.

Exhibit II-1: In CJR hospitals, the number of elective episodes grew slightly from quarter 4 of 2021 through 2024



Notes: CJR = Comprehensive Care for Joint Replacement; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

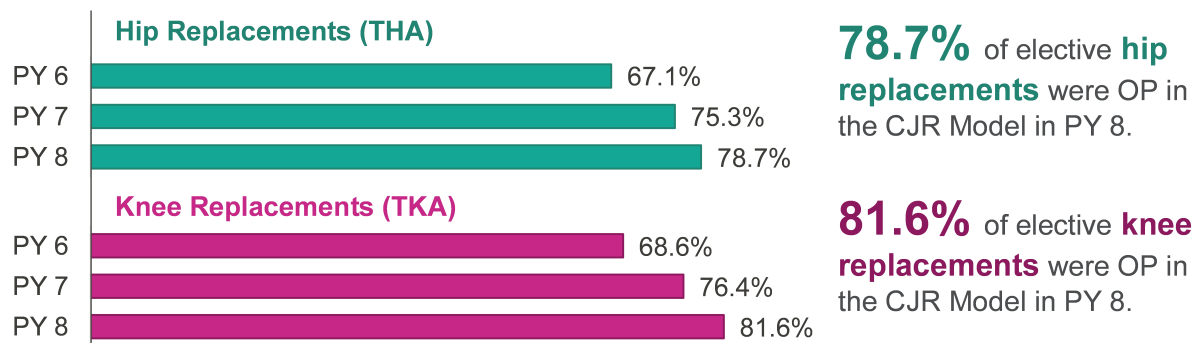
Beginning in the extension period, the CJR Model included OP THAs and TKAs. This shift followed Medicare policy changes that removed LEJRs from the Medicare Inpatient-Only list, starting with TKAs in 2018 and extending to THAs in 2020. After their inclusion, the share of LEJR episodes performed in OP settings increased each year (**Exhibit II-2**).



The proportion of OP LEJRs continued to increase in CJR hospitals

OP LEJRs were included in the CJR Model starting from PY 6 (episodes that ended between October 2021 and December 2022).

Exhibit II-2: CJR OP elective hip and knee replacements



Most THAs and TKAs were performed in the OP setting, but CJR hospitals continued to perform a slightly lower proportion of LEJRs in the OP setting than control hospitals. See **Appendix D: Additional Findings** for more information.

Notes: CJR = Comprehensive Care for Joint Replacement; LEJR = lower extremity joint replacement; OP = outpatient; PY = performance year; THA = total hip arthroplasty; TKA = total knee arthroplasty.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

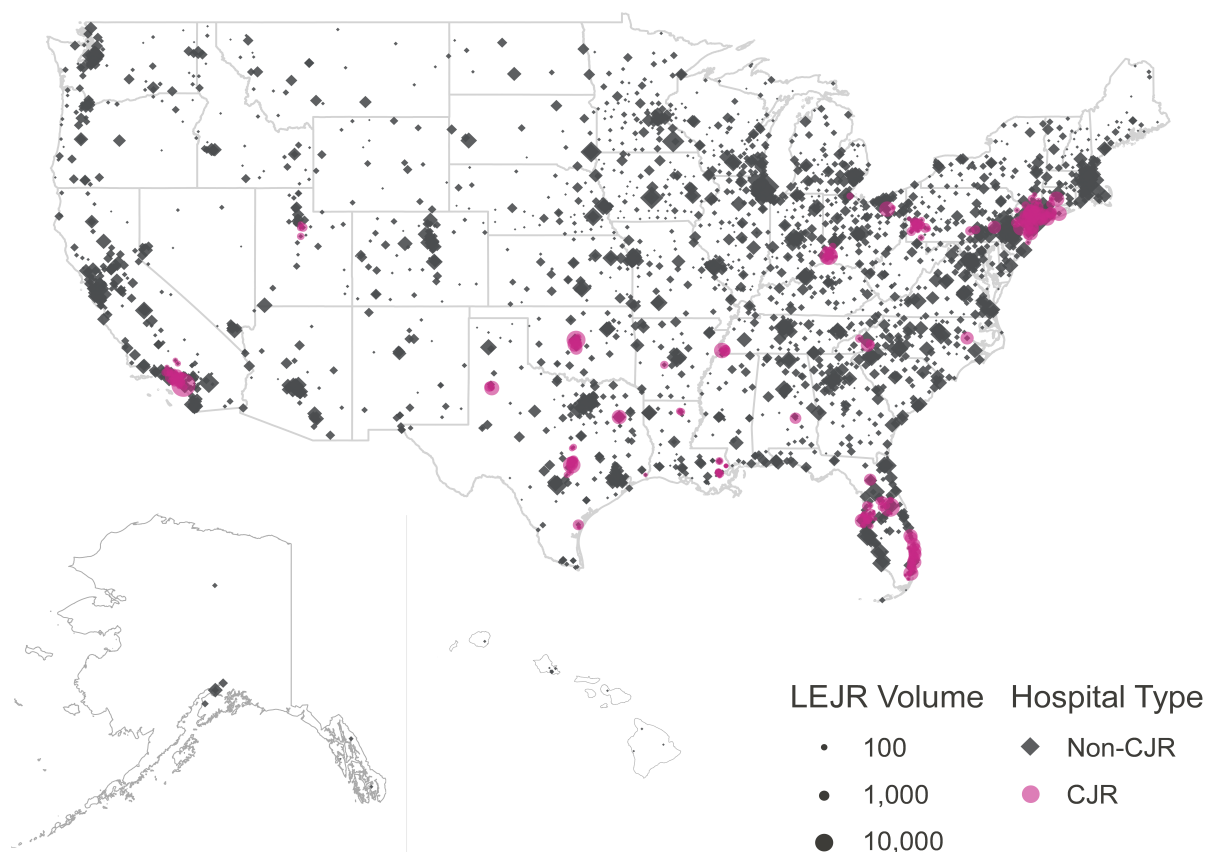
Regional Distribution and Patient Characteristics

CMS designed the CJR Model to reach a broad set of hospitals, including those that may not have participated under a voluntary framework. During the extension period, the model focused on metropolitan areas with higher historical episode spending, which has implications for how generalizable evaluation findings are nationally. We compared characteristics of CJR LEJRs with the national distribution of LEJRs to identify whether there were notable differences that could affect the generalizability of evaluation results. Additionally, we compared CJR and control patient characteristics during the extension period in order to provide context when interpreting impact results of the model, as discussed in [Chapter III: Impact of the Model](#).

1. Generalizability of CJR Episodes and Model Impact Results

During the extension period, 321 hospitals had at least one episode under the model. Most CJR episodes were in the Middle Atlantic, South Atlantic, and West South Central Census regions (**Exhibit II-3**). The New York–Newark–Jersey City, NY–NJ MSA recorded the highest volume, representing roughly 30% of all episodes at CJR hospitals. CJR episodes were somewhat concentrated in these and other metropolitan areas, reflecting the model's design choices.

Exhibit II-3: LEJRs at CJR hospitals were concentrated in the Middle Atlantic, South Atlantic, and West South Central Census regions



Notes: Gray diamonds represent all Medicare FFS LEJRs at hospitals not in the CJR Model. Pink circles represent CJR episodes. LEJRs with provider information are presented at the hospital ZIP Code level. No sampling weights were used when generating counts. Alaska and Hawaii are not on the same scale as continental states.

CJR = Comprehensive Care for Joint Replacement; FFS = fee-for-service; LEJR = lower extremity joint replacement; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

In the extension period, CJR episodes accounted for 11.1% of all hospital-based FFS LEJRs that met CJR eligibility rules. Despite geographic differences, CJR episodes and national hospital LEJRs were similar across many patient and episode characteristics, including elective and fracture mix, dual eligibility, obesity status, and dementia status (**Exhibit II-4**). Hospital OP LEJRs occurred less frequently among CJR episodes than among LEJRs at hospitals nationwide



Ambulatory Surgery Centers

During the extension period, **9.6% of national Medicare FFS LEJRs were performed at ASCs**. While LEJRs performed at ASCs are not episodes under the CJR Model, **the share of LEJRs occurring at ASCs increased over time**.

(65.9% vs. 71.0%). Overall, CJR episodes were among slightly older and less healthy individuals than national hospital LEJRs, as reflected in higher average HCC scores and higher diabetes prevalence. These differences suggest that CJR episodes included a somewhat more clinically complex set of LEJRs, where there may have been both greater opportunity and greater challenges for reducing episode spending. While notable, these differences were modest in magnitude, and the CJR population remained broadly representative of the national LEJR population relevant to potential expansion under CJR-X.

Exhibit II-4: In the extension period, CJR episodes were among older individuals, with more chronic conditions and greater clinical complexity, compared with national hospital LEJRs

Characteristic	CJR episodes (N = 143,319)	National hospital LEJRs (N = 1,291,447)
Fracture LEJR	11.5%	10.8%
Elective LEJR	88.6%	89.2%
Age, years	75.1*	74.7
Dual eligibility	7.2%	7.0%
Diabetes	27.1%*	24.6%
Obesity	34.1%	33.8%
Dementia	5.2%	4.6%
HCC score	1.51*	1.44
Hospital OP LEJR	65.9%*	71.0%

Notes: Blue cell shading indicates that CJR episodes had a relatively higher percentage of LEJRs with the characteristic compared with national hospital LEJRs. Tangerine cell shading indicates that they had a relatively lower percentage of LEJRs with the characteristic compared with national hospital LEJRs.

* Characteristics with an absolute standardized mean difference > 0.05.

Exclusion criteria used to derive CJR episodes from the national LEJR population are detailed in **Appendix B: Data and Methods**, while **Appendix C: Descriptive Statistics of the CJR Population** provides summaries of intermediate groupings, including ASC and hospital episodes and MSA-level episodes. No sampling weights were used when generating counts or descriptive statistics. The criterion for comparison was an absolute standardized mean difference greater than 0.05.

ASC = ambulatory surgery center; CJR = Comprehensive Care for Joint Replacement; HCC = Hierarchical Condition Category; LEJR = lower extremity joint replacement; MSA = metropolitan statistical area; N = number of observations, OP = outpatient; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

2. Comparison of CJR and Control Patient Characteristics

During the extension period, the evaluation control group consisted of hospitals located in MSAs that were not originally selected for the CJR Model but met the same high-spending criteria used to identify CJR MSAs. Hospitals in these MSAs were included in the control group unless they were excluded based on rural or low-volume status. Many patient and episode characteristics were comparable between CJR and control episodes (**Exhibit II-5**). Compared with control hospitals, CJR hospitals performed a smaller share of episodes in OP settings (65.9% vs. 70.9%). CJR episodes were more likely than control episodes to involve patients who were dually eligible

for Medicare and Medicaid (7.2% vs. 5.3%). Much of this difference can be attributed to the Los Angeles–Long Beach–Anaheim MSA, which was the second largest CJR MSA and had among the highest share of patients with dual eligibility of any MSA in the sample. CJR patients were also slightly older on average than patients treated at control hospitals.

These differences in patient and episode characteristics underscore the importance of risk adjustment for our main impact analyses. Differences may reflect random variation introduced by the model's design, which assigned participation at the MSA level and involved a limited number of MSAs. With this approach, some differences in characteristics across groups are expected to arise by chance, even when areas were selected using the same eligibility criteria.

Exhibit II-5: During the extension period, CJR and control episodes were similar overall, though CJR episodes were less likely to be OP, were among older individuals, and had a higher share of dual eligibility for Medicaid

Characteristic	CJR episodes (N = 143,319)	Control episodes (N = 151,209)
Fracture LEJR	11.5%	10.7%
Elective LEJR	88.6%	89.3%
Age, years	75.1*	74.7
Dual status	7.2%*	5.3%
Diabetes	27.1%	25.1%
Obesity	34.1%	34.9%
Dementia	5.2%	4.8%
HCC score	1.51	1.46
Hospital OP LEJR	65.9%*	70.9%

Notes: Blue cell shading indicates that CJR episodes had relatively more of the characteristic compared with control. Tangerine cell shading indicates that they had relatively less of the characteristic compared with control.

* Characteristics with an absolute standardized mean difference > 0.05.

Exclusion criteria used to derive CJR episodes from the national LEJR population are detailed in **Appendix B: Data and Methods**, while **Appendix C: Descriptive Statistics of the CJR Population** provides summaries of intermediate groupings, including ASC and hospital episodes and MSA-level episodes. No sampling weights were used when generating counts or descriptive statistics. The criterion for comparison was an absolute standardized mean difference greater than 0.05.

ASC = ambulatory surgery center; CJR = Comprehensive Care for Joint Replacement; HCC = Hierarchical Condition Category; LEJR = lower extremity joint replacement; MSA = metropolitan statistical area; N = number of observations, OP = outpatient; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

III. Impact of the Model

The CJR Model provided hospitals with financial incentives to reduce episode spending while maintaining quality. This chapter presents the final impact estimates for the CJR Model, combining all 3 years of the extension period.⁸



Key Points

Elective LEJRs

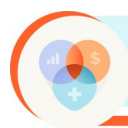
- Elective procedures made up nearly 89% of all CJR episodes in the extension period
- CJR led to a decrease of \$1,226 in episode payments for elective episodes, driven by reductions in IRF payments

Fracture LEJRs

- CJR did not change total episode payments
- While not statistically significant at the 10% level, CJR likely increased SNF payments and decreased IRF payments for fracture episodes

We estimated the model's impact using a DiD framework that measures changes in outcomes from the baseline (April 2012–March 2015) to the intervention (CJR extension, October 2021–December 2024) period for episodes at CJR hospitals relative to control hospitals.⁹ Throughout this chapter, we indicate where estimates can be interpreted with confidence as reliable estimates of model impact and where data limitations or statistical concerns may affect interpretation, potentially leading to over- or underestimation of impacts. We also report impact estimates as percentage of the risk-adjusted CJR baseline mean to provide context on the relative magnitude of the impact.¹⁰

During the CJR extension, hospitals completed 143,369 LEJR episodes, nearly 89% of which were elective. Elective procedures allow hospitals to optimize patients before surgery, for example, by managing chronic conditions and planning discharge and recovery supports in advance. These efforts can help shift care from higher-cost PAC settings (SNFs, IRFs) to lower-cost options, such as home with HH,



Key Outcomes for CJR Model Impacts:

- **Total episode payment** related to all covered services during the 90-day episode of care
- **Payment components:** anchor stay or procedure, PAC use (for example, SNF, IRF, HH) after discharge, readmissions, and other Part A and B services
- **Utilization:** first discharge setting, SNF length of stay, OP PT/OT visits
- **Quality of care:** unplanned readmissions, ED visits, complications, mortality

⁸ Overall, results were similar across PY 6, PY 7, and PY 8. See **Appendix D: Additional Findings** for results broken out for PY 6, PY 7, and PY 8.

⁹ Additional details of the outcome measures we analyzed and methods we used can be found in **Appendix B: Data and Methods**.

¹⁰ Additional information on when we interpret impacts as causal can be found in **Appendix B: Data and Methods** and **Appendix D: Additional Findings**.

when appropriate. By contrast, fractures are unplanned, higher-acuity events with fewer opportunities to influence care pathways.¹¹ Because hospital decision-making and patient populations differ substantially between elective and fracture episodes, and because these differences drive costs, we first report impacts separately for elective and fracture episodes. We then present combined results for all LEJR episodes to reflect outcomes for the full CJR population.

Impact of the CJR Model on Elective Episodes

During the extension period, the CJR Model led to a relative reduction in total episode payments of \$1,226 (90% confidence interval (CI): -\$2,422 to -\$30; p-value (p) = 0.09), representing a 4.8% reduction relative to CJR baseline payments. This reduction was primarily driven by a relative \$443 decrease in IRF payments (90% CI: -\$885 to -\$1; p = 0.10). There was a similar-sized relative reduction in each PY in the extension period (**Exhibit III-1**), indicating a sustained reduction in spending from baseline.



CJR reduced total episode payments across the extension period for elective LEJRs

Reductions in total episode payments were statistically significant at the 10% level in PY 6 and PY 8. For more information on PY-specific impacts, please refer to **Appendix D: Additional Findings**.

Exhibit III-1: PY-specific total payment impacts



Notes: CJR = Comprehensive Care for Joint Replacement; LEJR = Lower Extremity Joint Replacement, PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

The observed reductions in payments were consistent in magnitude with changes in utilization, particularly reduced use of IRF care. Although not statistically significant at the 10% level, point estimates indicate there was a relative decrease in the share of patients first discharged to an IRF compared with the control group. The magnitude of this decrease is similar to the reduction observed in IRF payments, with both measures indicating reductions of roughly one-quarter of total episode payments. Point estimates also suggest a relative reduction in discharges to home with OP PT/OT, offset by a relative increase in discharges to home with HH. However, because home with HH discharge patterns for CJR and control groups followed different trends prior to the

¹¹ A small number of outpatient fracture LEJRs occurred during the extension period and were excluded from the elective- and fracture-specific analyses but included in the analyses of all episodes.

model, we cannot be certain about the exact magnitude of this increase, and the estimated 12.8 percentage point (pp) increase likely overestimates the true effect.¹²

We also examined whether shifts in discharge destination were accompanied by changes in quality of care, based on four claims-based measures: ED visit rate, unplanned readmission rate, complication rate, and mortality rate. We found no evidence that the model had an impact on these outcomes (**Exhibit III-2**). For both CJR and control hospitals, unadjusted rates of unplanned readmissions, complications, and mortality declined and ED use increased slightly from baseline to the intervention period, with similar trends observed across groups. These findings indicate CJR hospitals maintained quality of care for elective episodes.

¹² Additional information on parallel trends can be found in **Appendix B: Data and Methods** and **Appendix D: Additional Findings**.

Exhibit III-2: In the extension period, CJR hospitals reduced total payments for elective LEJR episodes relative to control hospitals, while maintaining quality of care

Domain	Measure	Impact	Impact as a percentage of baseline ^a (%)	p-value	90% LCI	90% UCI
Payments: total and components	Total	-\$1,226	-4.8	0.09	-\$2,422	-\$30
	SNF	-\$300	-7.2	0.29	-\$768	\$168
	IRF	-\$443	-26.7	0.10	-\$885	-\$1
	HH ^b	\$172	7.3	0.41	-\$175	\$518
	Readmission ^b	-\$121	-12.8	0.21	-\$280	\$37
	Anchor	-\$32	-0.3	0.39	-\$93	\$29
	Other Part A	\$34	61.4	0.14	-\$4	\$73
	Other Part B ^b	-\$280	-5.9	0.07	-\$534	-\$27
Utilization: percent first discharged to setting	SNF	-1.89 pp	-4.9	0.45	-6.00 pp	2.21 pp
	IRF	-3.22 pp	-27.9	0.11	-6.54 pp	0.09 pp
	Home with HH ^b	12.84 pp	31.5	0.02	3.55 pp	22.13 pp
	Home with OP PT/OT	-5.02 pp	-79.1	0.12	-10.34 pp	0.31 pp
	Home (no HH or OP PT/OT)	-2.71 pp	-94.1	0.21	-6.29 pp	0.87 pp
Other utilization	SNF days	-0.33	-1.6	0.65	-1.56	0.89
	IRF days	0.06	0.6	0.80	-0.36	0.48
	Any HH use ^b	9.48 pp	12.8	0.18	-2.20 pp	21.15 pp
	OP PT/OT visits	0.09	0.7	0.86	-0.74	0.93
Quality	Unplanned readmission rate	-0.32 pp	-3.9	0.24	-0.77 pp	0.13 pp
	ED use rate	0.22 pp	1.8	0.58	-0.43 pp	0.86 pp
	Complication rate	-0.15 pp	-5.1	0.36	-0.42 pp	0.12 pp
	Mortality rate	-0.04 pp	-8.4	0.35	-0.12 pp	0.03 pp

Notes: The estimates in this exhibit are the result of a DiD model. DiD estimates that are significant at the 1%, 5%, or 10% significance levels are indicated by shading.

^a Percentages were calculated by dividing the impact by the risk-adjusted mean value of the outcome for CJR episodes in the baseline period.

^b CJR and control populations exhibited differential trends in the baseline period for this outcome, suggesting the resulting estimate may not be a valid estimate of the impact of the CJR Model. See **Appendix B: Data and Methods** and **Appendix D: Additional Findings** for more details.

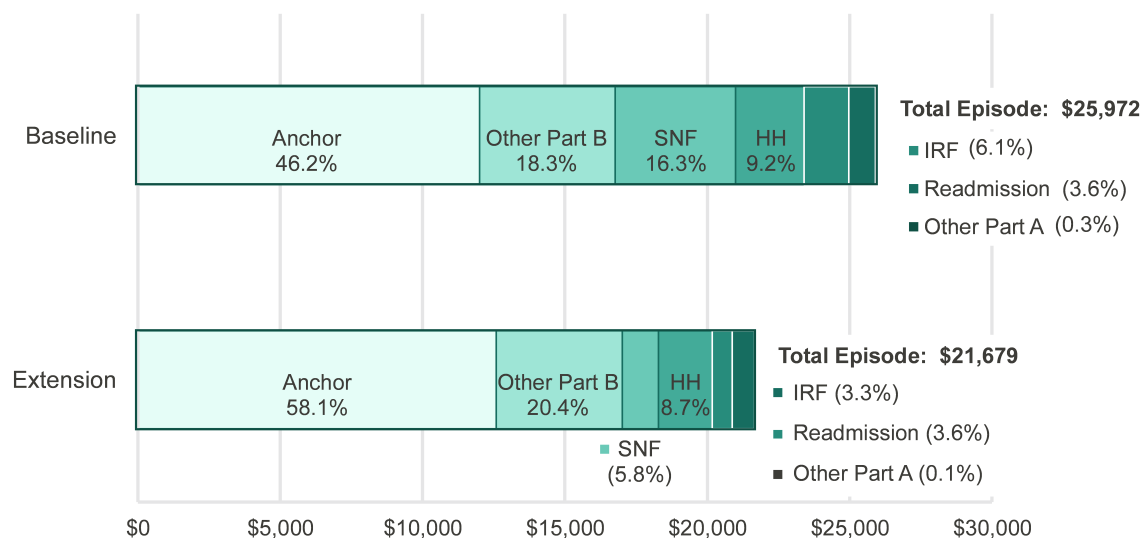
CJR = Comprehensive Care for Joint Replacement; DiD = difference-in-differences; ED = emergency department; HH = home health; IRF = inpatient rehabilitation facility; LCI = lower confidence interval; LEJR = lower extremity joint replacement; OP = outpatient; OT = occupational therapy; pp = percentage point; PT = physical therapy; PY = performance year; SNF = skilled nursing facility; UCI = upper confidence interval.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

To better understand the composition of total episode spending and to contextualize the impact estimates, we examined the average unadjusted payment components for CJR in both the baseline and extension period. **Exhibit III-3** shows how total episode spending decreased during this period. About one-fifth of total episode spending is attributable to Other Part B payments,

which include outpatient physical or occupational therapy (OP PT/OT), imaging and laboratory services, physician services, and durable medical equipment. Average payments in this category declined from the baseline to the extension period, and we estimated a statistically significant relative reduction for CJR (90% CI: –\$534 to –\$27; $p = 0.07$). However, CJR and control populations were on substantially differential trends in the baseline period, which is a more likely explanation for this finding than a reduction caused by CJR. Although average Other Part B payments declined, the share of total episode spending accounted for by Other Part B services increased in the extension. As OP PT/OT continues to gain popularity as a form of rehabilitation after LEJRs, future bundled payment models may see an increasingly large share of episode payments falling under this domain.

Exhibit III-3: Unadjusted elective episode spending showed substantial declines in SNF and IRF payments for CJR hospitals from baseline to the extension period



Notes: CJR = Comprehensive Care for Joint Replacement; HH = home health; IRF = inpatient rehabilitation facility; PY = performance year; SNF = skilled nursing facility.

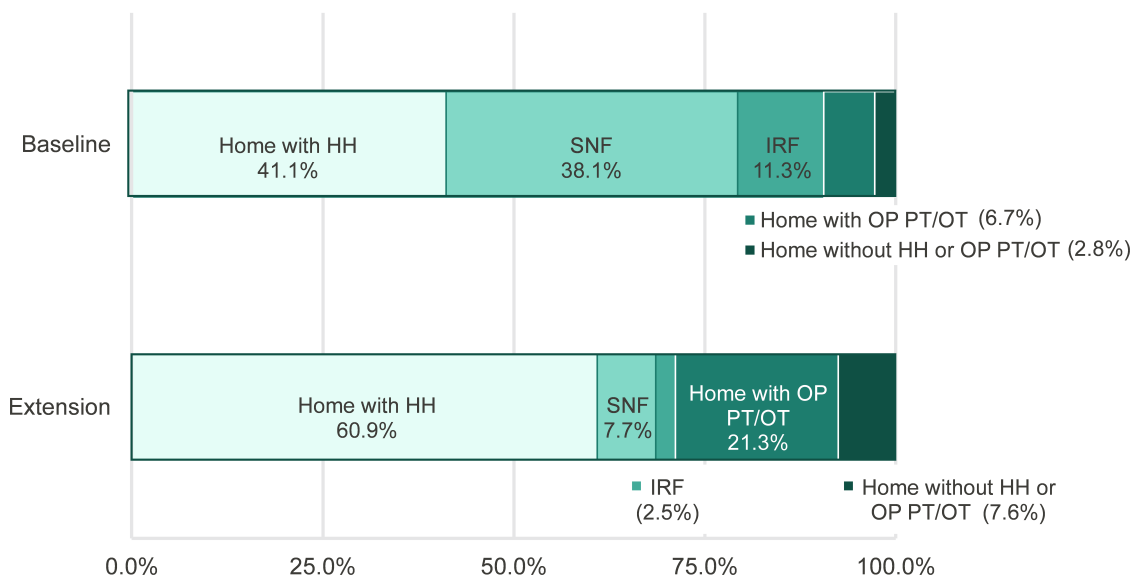
Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

Unadjusted trends in the first PAC location illustrate how decreases in IRF discharges drove the decreases in IRF payments and overall spending between baseline and extension period (**Exhibit III-4**). Over the same period that the proportion of patients discharged to IRF decreased, the proportion discharged to home (with and without home health) increased. This shift reflects a combination of broader secular trends and the impacts of CJR on IRF payment and utilization discussed earlier (**Exhibit III-2**).

As reported in the [CJR Drivers of Care Transformation Report](#), hospital interviews in earlier model PYs described a range of strategies CJR hospitals used to improve care across the episode. Many CJR hospitals reported beginning discharge planning for patients receiving elective LEJRs

well before they arrived for surgery. Patients received guidance on the most appropriate discharge destination based on their medical needs and personal circumstances, including their home environment and availability of caregiver support. Hospitals also reported proactively identifying patients at higher risk for complications and implementing tailored protocols to mitigate those risks, prevent adverse events, and reduce reliance on expensive institutional PAC settings. Hospitals stated they implemented efforts during surgery to ease the transition to the PAC setting. For example, they made changes to pain management, such as using peripheral nerve blocks instead of general anesthesia to allow for earlier ambulation and increased PT services during the hospital stay.

Exhibit III-4: Unadjusted breakdown of first PAC location showed substantial increases in discharges home with HH and home with OP PT/OT for CJR hospitals from baseline to the extension period



Notes: CJR = Comprehensive Care for Joint Replacement; HH = home health; IRF = inpatient rehabilitation facility; OP = outpatient; OT = occupational therapy; PAC = post-acute care; PT = physical therapy; PY = performance year; SNF = skilled nursing facility.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

The relative reduction in IRF discharges occurred in the context of broader national trends toward lower IRF use. Average IRF payments declined over time in both the CJR and control groups, and only 2.5% of elective LEJR episodes involved any IRF spending during the extension period compared with 11.3% at baseline. Medicare coverage requirements limit IRF care to patients who require intensive, multidisciplinary rehabilitation and ongoing physician supervision, concentrating IRF use among higher-acuity and more clinically complex cases. Although many of these higher-acuity patients who received IRF care were among the shrinking share of elective LEJR episodes performed in the IP setting, more than half received IRF care following an OP

procedure. As OP LEJRs became increasingly common during the extension period, IRF care remained a possible, though rare, PAC option following OP procedures.

Impact of the CJR Model on Fracture Episodes

Fracture LEJR surgeries are unplanned and urgent, giving hospitals fewer opportunities to influence preoperative care compared with elective cases, and patients are typically higher acuity with fewer options for safe discharge home following surgery. Despite the difference in care pathways, CJR hospitals were still incentivized to find efficiencies. In interviews, hospitals reported that their main strategies focused on conducting timely surgery (within 24 hours of admission) and avoiding unnecessarily intensive post-acute settings when patients could safely recover at home. Hospitals with a higher share of fracture cases or more complex fracture episodes, including trauma centers interviewed in 2022 for the [CJR Sixth Annual Report](#), reported that they had limited opportunities to generate savings for this population. This perception is consistent with our claims-based analysis of nearly 20,000 CJR fracture episodes during the extension period. We found no significant impact of the CJR Model on changes in fracture episode costs (**Exhibit III-5**); average costs per fracture episode increased from the baseline to the extension period for both CJR and control hospitals. We observed no relative differences between the CJR and control groups in unplanned readmissions, ED visits, complications, or mortality, suggesting that overall quality of care was maintained under the CJR Model.¹³

¹³ See **Appendix D: Additional Findings** for additional results on quality, including results for the non-dually eligible and dually eligible fracture populations.

Exhibit III-5: Impact of the CJR Model on payments, utilization, and quality in the extension period for fracture LEJR episodes

Domain	Measure	Impact	Impact as a percentage of baseline ^a (%)	p-value	90% LCI	90% UCI
Payments: total and components	Total	-\$111	-0.2	0.89	-\$1,442	\$1,219
	SNF	\$1,341	8.1	0.08	\$93	\$2,589
	IRF ^b	-\$1,232	-22.6	0.11	-\$2,492	\$27
	HH	-\$16	-0.7	0.82	-\$135	\$102
	Readmission	-\$115	-4.4	0.44	-\$361	\$131
	Anchor	\$46	0.3	0.45	-\$56	\$149
	Other Part A	\$174	31.3	0.24	-\$70	\$418
	Other Part B	\$36	0.6	0.82	-\$222	\$295
Utilization: percent first discharged to setting	SNF ^b	2.18 pp	3.4	0.41	-2.19 pp	6.56 pp
	IRF ^b	-5.70 pp	-20.6	0.11	-11.63 pp	0.23 pp
	Home with HH	3.38 pp	63.1	0.01	1.32 pp	5.45 pp
	Home with OP PT/OT	-0.08 pp	-9.1	0.72	-0.46 pp	0.30 pp
	Home (no HH or OP PT/OT)	0.22 pp	15.8	0.59	-0.43 pp	0.87 pp
Other utilization	SNF days	1.59	3.7	0.19	-0.39	3.57
	IRF days	-0.17	-1.2	0.62	-0.73	0.39
	Any HH use	-0.96 pp	-1.4	0.34	-2.62 pp	0.70 pp
	OP PT/OT visits	0.30	2.9	0.43	-0.34	0.95
Quality	Unplanned readmission rate	-1.12 pp	-5.3	0.27	-2.80 pp	0.56 pp
	ED use rate	-0.88 pp	-4.9	0.31	-2.30 pp	0.55 pp
	Complication rate	-0.31 pp	-3.1	0.53	-1.13 pp	0.51 pp
	Mortality rate	-0.28 pp	-2.2	0.63	-1.22 pp	0.66 pp

Notes: The estimates in this exhibit are the result of a DiD model. DiD estimates that are significant at the 1%, 5%, or 10% significance levels are indicated by shading.

^a Percentages were calculated by dividing the impact by the risk-adjusted mean value of the outcome for CJR episodes in the baseline period.

^b CJR and control populations exhibited differential trends in the baseline period for this outcome, suggesting the resulting estimate may not be a valid estimate of the impact of the CJR Model. See **Appendix B: Data and Methods** and **Appendix D: Additional Findings** for more details.

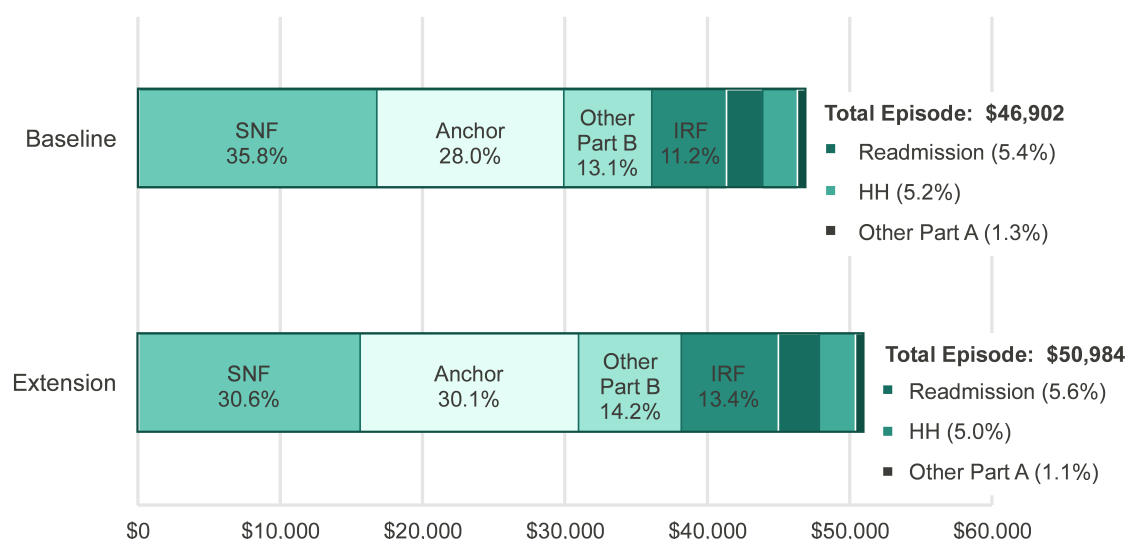
CJR = Comprehensive Care for Joint Replacement; DiD = difference-in-differences; ED = emergency department; HH = home health; IRF = inpatient rehabilitation facility; LCI = lower confidence interval; LEJR = lower extremity joint replacement; OP = outpatient; OT = occupational therapy; pp = percentage point; PT = physical therapy; PY = performance year; SNF = skilled nursing facility; UCI = upper confidence interval.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

We examined unadjusted episode spending and its components to provide context on fracture care during the extension period and changes since baseline. Between the baseline and extension period, average episode spending increased for both CJR and control groups. As shown in **Exhibit III-6**, these increases reflected changes across multiple components of

spending, driven primarily by higher costs for the anchor stay, IRF care, and Other Part B services.

Exhibit III-6: For fracture LEJRs in CJR hospitals, unadjusted episode spending increased for all categories except SNF from baseline to the extension period



Notes: CJR = Comprehensive Care for Joint Replacement; HH = home health; IRF = inpatient rehabilitation facility; LEJR = lower extremity joint replacement; PY = performance year; SNF = skilled nursing facility.

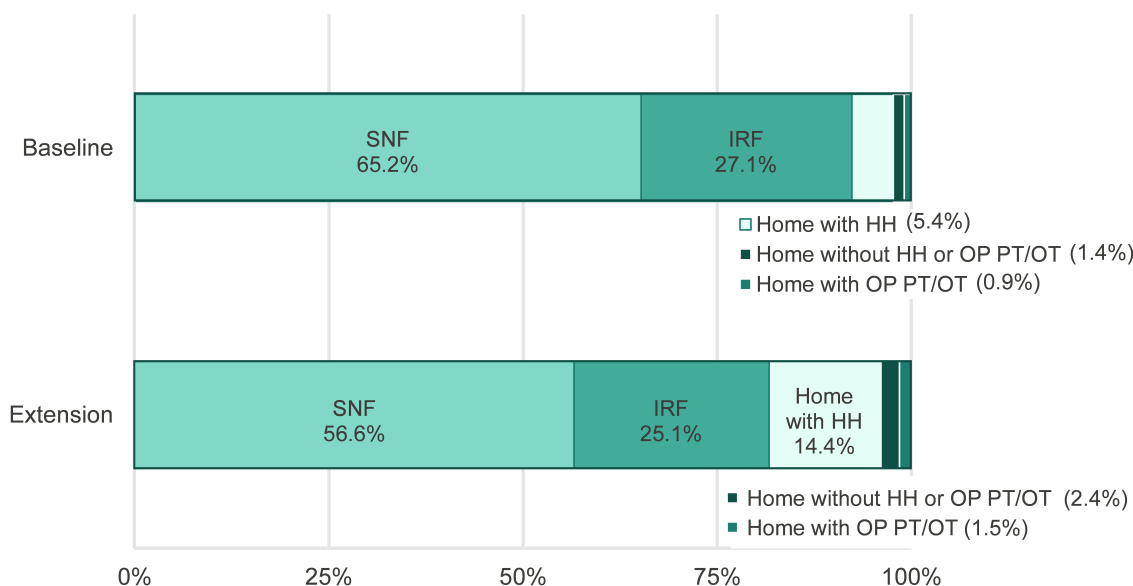
Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

Results suggest that CJR shifted fracture episode spending away from IRFs and toward SNFs. CJR led to a relative increase in SNF payments of \$1,341 (90% CI: \$93 to \$2,589; $p = 0.08$) compared with the control group. Although not statistically significant, results also suggest that CJR led to a relative reduction in IRF payments compared to the control group (DiD = $-\$1,232$; 90% CI: $-\$2,492$ to $\$27$; $p = 0.11$). CJR and control hospitals had different IRF spending trends in the baseline period, suggesting estimated reductions on IRF spending may be underestimated and the true impact is likely a larger reduction than the estimated impact of $-\$1,232$. One plausible explanation of these impact findings is that some hospitals prioritized reducing IRF utilization for patients with a fracture, and as a result, more CJR patients were directed to SNFs.

The unadjusted trends are consistent with this pattern. For both CJR and control, unadjusted SNF payments decreased from the baseline to the extension period (**Exhibit III-6**), although the decline was smaller for CJR hospitals. During this same time, unadjusted IRF spending increased for both CJR and control hospitals, but the increase was smaller for CJR hospitals. SNF accounted for more than 30% of fracture episode spending and remained the most common first PAC destination in both the baseline and extension periods.

Although home with HH was a less common first PAC location for fracture than for elective episodes, discharges home with HH increased from baseline to the extension period for both CJR and control hospitals in unadjusted analyses (**Exhibit III-7**). Within this broader shift towards home health, CJR increased the proportion of patients with a fracture discharged home with home health more than control hospitals (DiD = 3.38 pp; 90% CI: 1.32 to 5.45; $p = 0.01$) (**Exhibit III-5**).

Exhibit III-7: For fracture LEJRs at CJR hospitals, the unadjusted breakdown of first PAC location showed substantial increases in discharges home with HH and home with OP PT/OT from baseline to the extension period



Notes: CJR = Comprehensive Care for Joint Replacement; HH = home health; IRF = inpatient rehabilitation facility; LEJR = lower extremity joint replacement; OP = outpatient; OT = occupational therapy; PAC = post-acute care; PT = physical therapy; PY = performance year; SNF = skilled nursing facility.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

CJR hospitals may have been incentivized to shift care outside the episode window so that related payments would not be included in their episode spending performance. To assess this potential unintended consequence of the model, we examined changes in payments during the 30 days following the episode. For the fracture population, CJR hospitals had a \$404 relative increase in Medicare spending in the 30 days after the episode (90% CI: \$169 to \$639; $p < 0.01$). As discussed in the [CJR Seventh Annual Report](#), this increase likely reflects that patients with fractures at CJR hospitals were more likely to remain in a SNF at the end of the 90-day post-discharge period, with those stays continuing into the subsequent 30 days and generating additional payments. These findings do not indicate intentional shifting of care beyond the episode window to avoid costs; evidence of deliberate care shifting would have included SNF or other post-acute care initiating after the episode window ended, which we did not observe. Although it is unlikely to be associated with a deliberate attempt to avoid episode costs, this

increase in spending outside the episode window may represent an unintended consequence of the model. Because Medicare program savings estimates only include spending during the episode, this post-episode spending is not reflected in those estimates. See [Section IV: Medicare Program Savings](#) for more information regarding Medicare program savings and **Appendix D: Additional Findings** for more information regarding the impact on 30-day post-episode payments.

Impact of the CJR Model on All Episodes

We examined outcomes for all LEJR episodes treated at CJR hospitals to assess the model's overall effects on spending, utilization, and quality. Because elective episodes accounted for nearly 89% of all episodes, results generally mirror those for elective episodes.

During the extension period, CJR hospitals likely reduced total episode payments relative to the control group. Although the estimated impact did not reach statistical significance at the 10% level, several factors suggest a reduction in payments: the size of the estimate, the negative portion of the 90% CI, consistent trends over time, and similar statistically significant findings reported in prior annual evaluations. The estimated reduction was \$998 (90% CI: -\$2,046 to \$51; $p = 0.12$), with reductions of similar magnitude observed in each extension period PY (**Exhibit III-8**). **Appendix D: Additional Findings** presents a graph of CJR and control group payments over time. Similar to elective episodes, the main contributor to the likely overall payment reductions was decreases in payments to IRFs. However, the estimated impact on IRF payments for all episodes is not statistically significant.

While both the CJR and control group reduced IRF use over time, the decline was likely larger among CJR hospitals, though not statistically significant at the 10% level. Results also suggested a relative shift under the CJR Model away from discharges to home with OP PT or OT and toward home with HH care. However, CJR and control hospitals had different discharge trends in the baseline period, suggesting the estimated increase in HH use may be overestimated and the true impact is likely smaller than the estimated 11.41 pp increase. We also looked at 30-day post-episode payments for the full LEJR population. While we did find a statistically significant increase in this potential unintended consequence of the model, the evidence suggests the impact was primarily driven by fracture episodes. See **Appendix D: Additional Findings** for more information.

Across the full LEJR population, the CJR Model did not lead to changes in any of the four claims-based quality outcomes, indicating that the likely shifts in PAC use did not come at the expense of increased ED visits, complications, unplanned readmissions, or mortality. We also examined patient-reported experience in prior reports before the extension period, most recently in the [CJR Fifth Annual Report](#), and found little evidence of negative effects on functional status or care experience following a CJR episode.

Exhibit III-8: Impact of the CJR Model on payment, utilization, and quality in the extension period for all LEJR episodes

Domain	Measure	Impact	Impact as a percentage of baseline ^a (%)	p-value	90% LCI	90% UCI
Payments: Total and components	Total	-\$998	-3.5	0.12	-\$2,046	\$51
	SNF	-\$96	-1.6	0.77	-\$622	\$431
	IRF	-\$556	-25.4	0.11	-\$1,136	\$24
	HH ^b	\$166	7.0	0.39	-\$149	\$482
	Readmission	-\$126	-10.8	0.21	-\$291	\$38
	Anchor	-\$11	-0.1	0.71	-\$60	\$38
	Other Part A	\$60	50.2	0.16	-\$10	\$129
	Other Part B ^b	-\$232	-4.7	0.11	-\$472	\$7
Utilization: percent first discharged to setting	SNF	-0.90 pp	-2.2	0.67	-4.39 pp	2.59 pp
	IRF	-3.82 pp	-28.0	0.11	-7.73 pp	0.09 pp
	Home with HH ^b	11.41 pp	31.5	0.03	2.95 pp	19.88 pp
	Home with OP PT/OT	-4.41 pp	-78.1	0.12	-9.04 pp	0.22 pp
	Home (no HH or OP PT/OT)	-2.28 pp	-83.7	0.24	-5.49 pp	0.93 pp
Other Utilization	SNF days ^b	0.49	1.8	0.57	-0.94	1.93
	IRF days	-0.01	-0.1	0.96	-0.51	0.49
	Any HH use ^b	8.14 pp	11.1	0.19	-2.11 pp	18.38 pp
	OP PT/OT visits	0.11	0.9	0.82	-0.71	0.93
Quality	Unplanned readmission rate	-0.44 pp	-4.5	0.19	-1.00 pp	0.11 pp
	ED use rate	0.05 pp	0.4	0.90	-0.59 pp	0.69 pp
	Complication rate	-0.18 pp	-4.5	0.33	-0.47 pp	0.12 pp
	Mortality rate	-0.08 pp	-3.4	0.46	-0.26 pp	0.10 pp

Notes: The estimates in this exhibit are the result of a DiD model. DiD estimates that are significant at the 1%, 5%, or 10% significance levels are indicated by shading.

^a Percentages were calculated by dividing the impact by the risk-adjusted mean value of the outcome for CJR episodes in the baseline period.

^b CJR and control populations exhibited differential trends in the baseline period for this outcome, suggesting the resulting estimate may not be a valid estimate of the impact of the CJR Model. See **Appendix B: Data and Methods** and **Appendix D: Additional Findings** for more details.

CJR = Comprehensive Care for Joint Replacement; DiD = difference-in-differences; ED = emergency department; HH = home health; IRF = inpatient rehabilitation facility; LCI = lower confidence interval; LEJR = lower extremity joint replacement; OP = outpatient; OT = occupational therapy; pp = percentage point; PT = physical therapy; PY = performance year; SNF = skilled nursing facility; UCI = upper confidence interval.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention).

IV. Medicare Program Savings

Under the CJR Model, Medicare achieved savings when the reductions in total Medicare payments for CJR episodes exceeded the net reconciliation payments made to CJR hospitals. Over the first 5 PYs, the CJR Model resulted in overall estimated losses to Medicare. For mandatory participant hospitals, these losses were driven entirely by flexibilities offered during the COVID-19 Public Health Emergency, which outweighed savings generated in the first 4 PYs. The model also generated losses through voluntary participant hospitals, which were removed from the model starting in PY 6. For detailed results covering the first 5 PYs, see the [CJR Fifth Annual Report](#). For the extension period of the model (PY 6–PY 8), CMS made several changes that, taken together, may have improved the model's ability to generate savings:

- All voluntary participants were removed from the model at the start of PY 6. The remaining mandatory participants generated higher historical estimated Medicare savings.
- The model began including OP LEJRs as episodes. Prior to their inclusion, CJR participants may have been incentivized to perform IP LEJRs even when the OP setting was appropriate.
- The calculation of target prices changed, incorporating a retrospective market trend adjustment and using only the most recently available year of past data to better reflect recent changes in episode spending.
- Target prices included additional episode-level risk adjustment, allowing for target prices to vary based on patient age, dual-eligibility status, and medical complexity.



Key Points

Over the Extension Period	In Each Performance Year	Hospital Variability
• The CJR Model resulted in estimated savings of \$180 M across PY 6–PY 8 • Hospitals cumulatively repaid \$44 M to CMS over the extension period	• Every PY in the extension period increased savings to Medicare, with a maximum of \$68 M in PY 8	• The distribution of reconciliation payments and repayments to Medicare across hospitals was uneven, with the top 10% of hospitals receiving \$45 M and the bottom 10% repaying \$58 M over the extension period

This chapter presents estimated Medicare savings, overall and per episode, during the extension period covering episodes that ended between October 1, 2021, and December 31, 2024. It also discusses findings on hospital-level variation in reconciliation payments and repayments to Medicare.

Net Medicare Savings in the CJR Extension Period

The CJR Model generated an estimated \$180 M in net savings for Medicare, after accounting for the model's impact on episode spending and incentive payments made to or received from model participants (90% CI: \$30 M to \$329 M) (**Exhibit IV-1**).

Exhibit IV-1: Medicare program savings from the CJR Model in the extension period



Notes: CJR episode payment reductions were estimated using a DiD on standardized paid episode expenditures (90% CI: -\$13 M to \$286 M). Net Medicare savings were estimated by summing CJR episode payment reductions and net reconciliation payments (90% CI: \$30 M to \$329 M).
CI = confidence interval; CJR = Comprehensive Care for Joint Replacement; DiD = difference-in-differences; M = million; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention) as well as CJR payment contractor data for CJR participant hospitals in PY 6–PY 8.

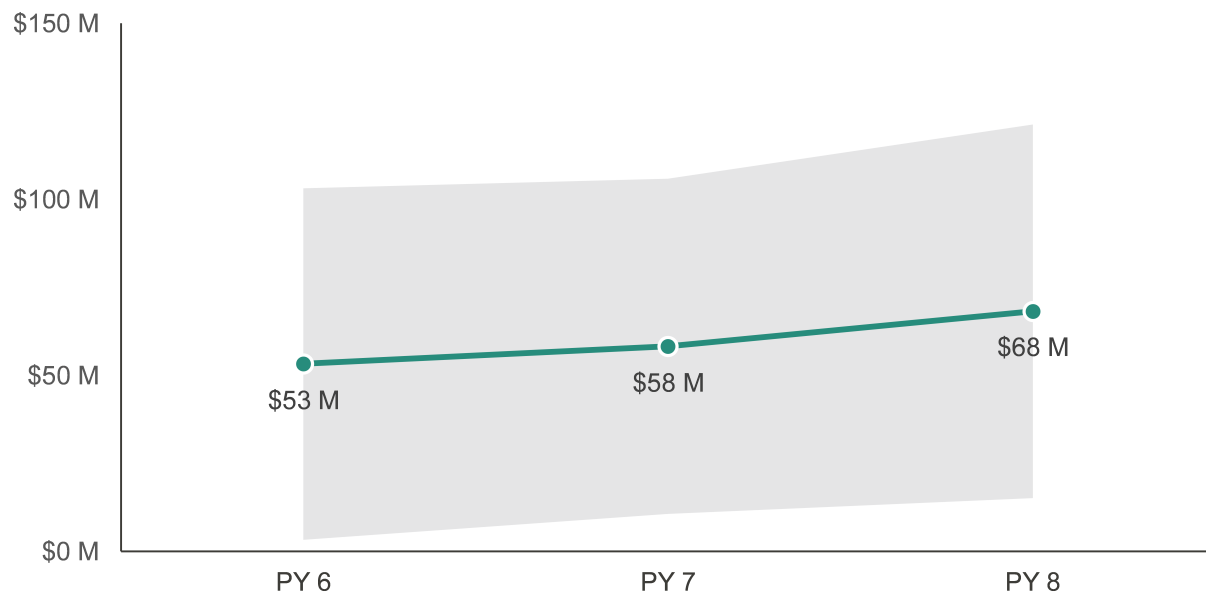
Medicare savings resulted from both reductions in elective episode spending caused by the model and repayments to CMS made by hospitals that exceeded their target prices. As seen in **Exhibit IV-1**, episode payment reductions accounted for most of the estimated net savings (\$136 M, 90% CI: -\$13 M to \$286 M), representing over three-quarters of the total. While estimated changes in episode spending were relatively consistent over time, reconciliation payments followed a different pattern in the extension period. Unlike the first 4 PYs of the model, in which CMS made more reconciliation payments to hospitals than it received in repayments, CMS received net repayments from hospitals during the extension period.¹⁴

Total estimated Medicare savings increased across PYs from \$53 M in PY 6 to \$68 M in PY 8 (**Exhibit IV-2**).¹⁵ Estimated episode payment reductions remained relatively stable during this period, ranging from \$40 M to \$49 M. The increase in total Medicare savings was driven primarily by growth in repayments from hospitals to CMS (**Exhibit IV-3**).

¹⁴ PY 5 reconciliation payments were significantly affected by flexibilities that CMS offered in response to the COVID-19 public health emergency.

¹⁵ PY 6 spanned 15 months, compared with 12 months each for PY 7 and PY 8. Comparisons of total savings should be interpreted accordingly.

Exhibit IV-2: During the extension period, CJR hospitals generated over \$50 M of net Medicare savings in every PY



Notes: The gray shaded area represents the 90% CI.

CI = confidence interval; CJR = Comprehensive Care for Joint Replacement; M = million; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention) as well as CJR payment contractor data for CJR participant hospitals in PY 6–PY 8.

Exhibit IV-3: Total episode payment reductions were consistent throughout the extension period, but the largest repayments to CMS occurred in PY 7 and PY 8

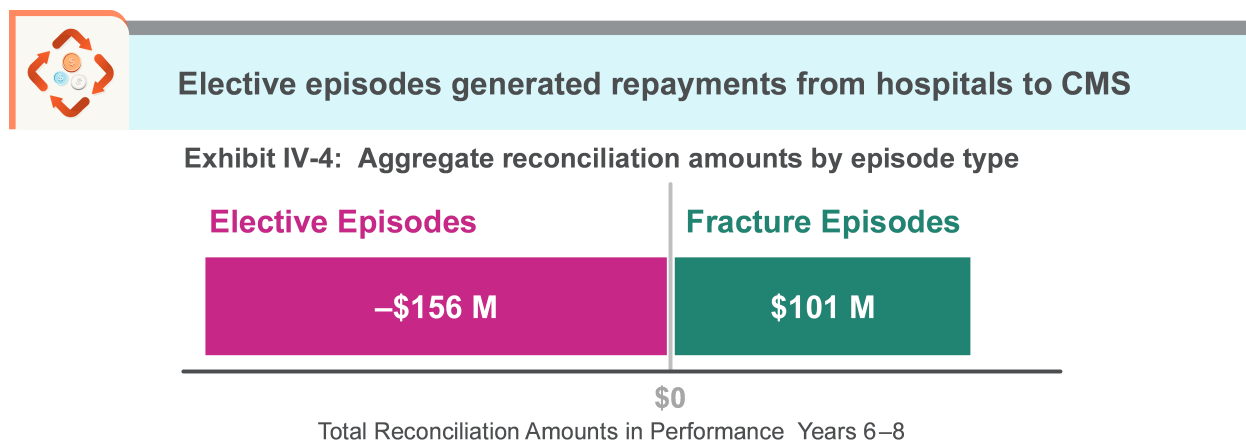
Total savings element	PY 6	PY 7	PY 8
Total episode payment reduction (90% CI)	\$49 M (-\$1 M to \$99 M)	\$40 M (-\$8 M to \$88 M)	\$47 M (-\$6 M to \$100 M)
Net repayments from hospitals to CMS	\$4 M	\$18 M	\$21 M

Notes: Reductions in episode payments are estimated with a DiD model as reductions in standardized paid amounts, which are then converted to nonstandardized dollars. We do not report CIs for net repayments from hospitals to CMS per episode or the number of episodes because these were not estimated; rather, they were observed with certainty.

CI = Confidence Interval; CJR = Comprehensive Care for Joint Replacement; DiD = difference-in-differences; M = million; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention) as well as CJR payment contractor data for CJR participant hospitals in PY 6–PY 8.

While we observed average episode payment reductions and increased repayments over the extension period for all LEJR episodes, reconciliation patterns differed substantially between elective and fracture episodes (**Exhibit IV-4**). Elective episodes accounted for nearly 89% of all CJR episodes and generated \$156 M in repayments to CMS. In contrast, fracture episodes generally resulted in reconciliation payments to hospitals. Although fracture episodes represented only 11% of episodes, they generated \$101 M in reconciliation payments, offsetting nearly two-thirds of the repayments from elective episodes.¹⁶ Higher reconciliation payments for fracture episodes may be partly attributable to changes in the target price methodology for the extension period, which coincided with a rise in target prices.



Elective episodes generated repayment responsibility for hospitals in aggregate. Fracture episodes, despite accounting for only 11% of all episodes, generated reconciliation payments that offset nearly two-thirds of the repayments from elective episodes.

Notes: Due to data limitations, elective episodes in Medicare program savings estimates include a small number of OP fractures.

CJR = Comprehensive Care for Joint Replacement; M = million, OP = outpatient; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention) as well as CJR payment contractor data for CJR participant hospitals in PY 6–PY 8.

Net Medicare Savings per Episode

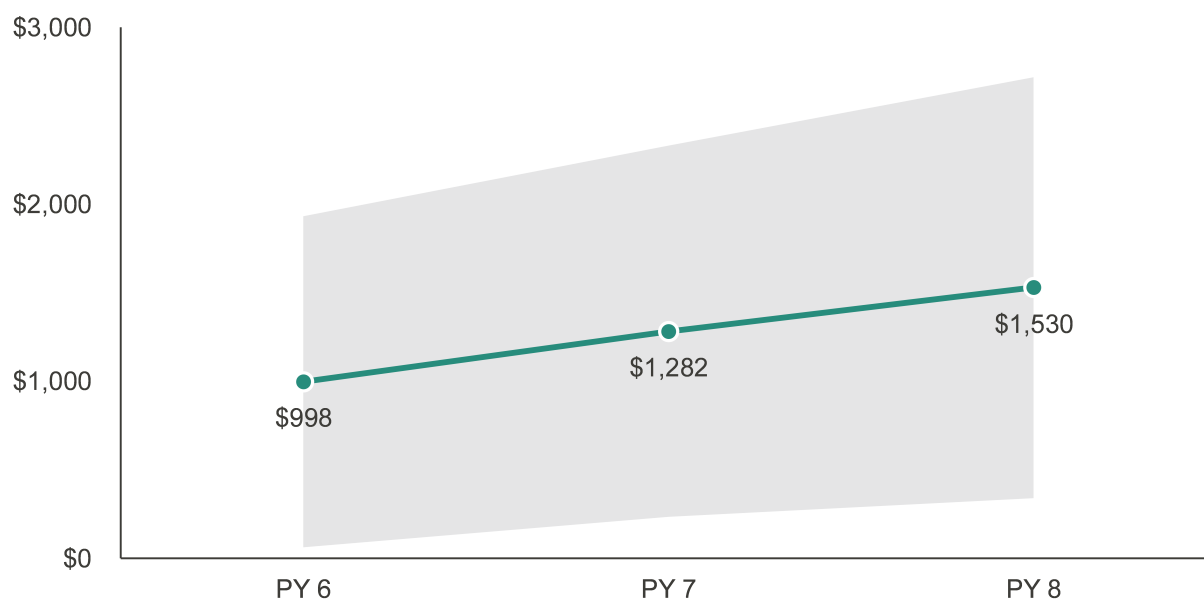
Net Medicare savings per episode provides a standardized measure that is independent of episode volume and captures the combined impact of changes in episode spending and reconciliation payments, allowing for meaningful comparisons across PYs. During the extension

¹⁶ The model includes some hospital-level adjustments (like stop-gain, stop-loss) and model rules (like preventing reconciliation payments for hospitals with “Below Acceptable” quality ratings) that apply to the repayment or reconciliation amount after combining fracture and elective episodes. Hospital-level adjustments reduced the total net repayment amount from \$54 M to \$44 M.

period, estimated net savings to Medicare ranged between \$998 per episode in PY 6 and \$1,530 per episode in PY 8 (**Exhibit IV-5**) and were statistically significant at the 10% level in all 3 years.

Episode volume was relatively constant, with a slight decline over time, indicating that changes in total net savings were likely driven by changes in reconciliation or per-episode payment reductions. Estimated episode payment reductions varied modestly across the extension period, ranging from a low of \$878 per episode in PY 7 to a high of \$1,059 in PY 8 with no clear upward or downward trend over time. Unlike episode payment reductions, average repayments per episode increased substantially over time, rising from \$78 per episode in PY 6 to \$471 in PY 8, and contributed to higher estimated Medicare savings in later years of the extension period (**Exhibit IV-6**).

Exhibit IV-5: During the extension period, CJR hospitals generated net Medicare savings between \$998 and \$1,530 per episode



Notes: The gray shaded area represents the 90% CI.

CJR = Comprehensive Care for Joint Replacement; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention) as well as CJR payment contractor data for CJR participant hospitals in PY 6–PY 8.

Exhibit IV-6: Episode payment reductions were consistent across the extension period, but the largest per-episode repayments to CMS occurred in PY 7 and PY 8

Per-episode savings element	PY 6	PY 7	PY 8
Average episode payment reduction (90% CI)	\$920 (-\$15 to \$1,856)	\$878 (-\$170 to \$1,927)	\$1,059 (-\$130 to \$2,248)
Net repayments from hospitals to CMS per episode	\$78	\$404	\$471
LEJR episodes	53,326	45,415	44,628

Notes: Reductions in episode payments were estimated with a DiD model as reductions in standardized paid amounts, which were then converted to non-standardized dollars. We do not report CIs for net repayments from hospitals to CMS per episode or the number of episodes because these were not estimated; rather, they were observed with certainty. We calculated aggregate Medicare savings by multiplying Medicare savings per episode by the number of episodes. Medicare savings per episode equals the estimated reduction in non-standardized paid amounts per episode plus the average repayments per episode. The range reported for Medicare savings is based on the 90% CI for the reduction in episode spending. The number of LEJR episodes are from payment contractor data to align with data available for reconciliation payment.

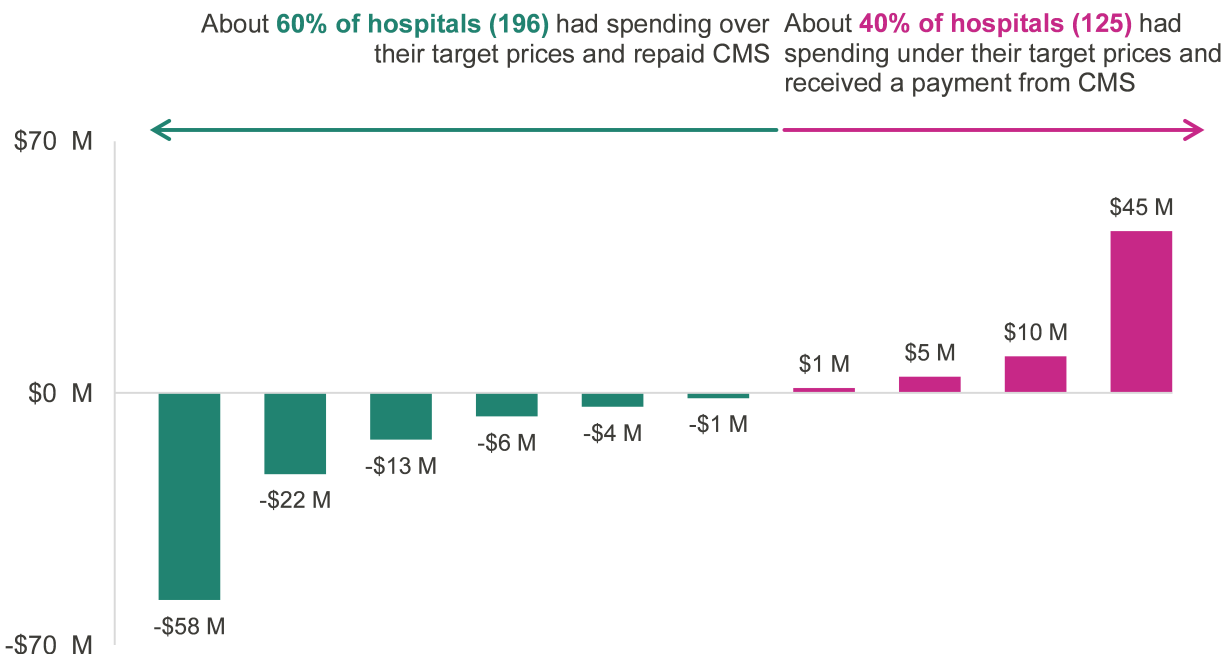
CI = confidence interval; CJR = Comprehensive Care for Joint Replacement; DiD = difference-in-differences; LEJR = lower extremity joint replacement; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between January 1, 2022, and December 31, 2024 (PY 6–PY 8 intervention) as well as CJR payment contractor data for CJR participant hospitals in PY 6–PY 8.

Hospital Net Reconciliation Payments

While the analyses above describe the average effects of the CJR Model, we also examined the distribution of net reconciliation payments and repayments across hospitals to assess whether financial impacts varied among model participants. Net reconciliation amounts varied substantially across hospitals (**Exhibit IV-7**), indicating that the model's financial effects, both positive and negative, were concentrated among a relatively small share of participating hospitals. During the extension period, the 10% of hospitals with the largest repayment amounts collectively repaid \$58 M, accounting for slightly more than half of all repayments. Conversely, the 10% of hospitals receiving the largest reconciliation payments collectively received \$45 M, representing more than 70% of all reconciliation payments. This pattern was consistent across PYs.

Exhibit IV-7: Most hospitals owed repayments to CMS cumulatively over the extension period



Notes: Hospitals were ranked by net reconciliation payments received and divided into 10 equally sized groups. Each bar in the figure represents the cumulative spending for one such hospital group.

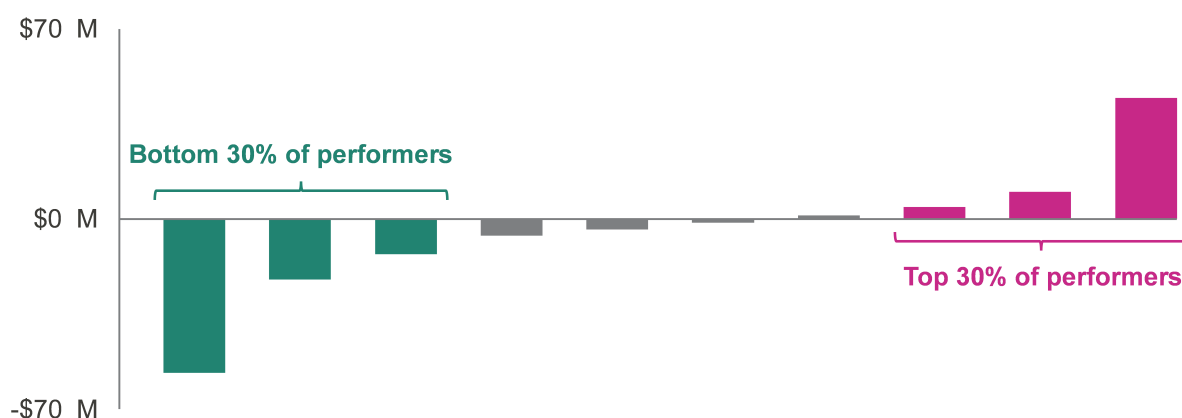
CJR = Comprehensive Care for Joint Replacement; M = million; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes initiated between January 1, 2012, and December 31, 2014, that ended between April 1, 2012, and March 31, 2015 (baseline) and episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention) as well as CJR payment contractor data for CJR participant hospitals in PY 6–PY 8.

Variation in net payment reconciliation reflected how hospitals' episode spending compared to their target prices and their quality performance. Hospitals with lower episode spending relative to their region were more likely to receive reconciliation payments, particularly if they also achieved higher quality ratings, which increased target prices by reducing the discount factor applied in their calculation. Quality ratings varied little across hospitals during the extension period, with most participant hospitals receiving a rating of "Good" in each PY. The greatest financial effects of this reconciliation calculation were concentrated among a subset of hospitals, leading us to examine hospitals in the top and bottom 30% of the net reconciliation payment distribution to better understand the characteristics associated with higher and lower financial performance under the model.¹⁷

¹⁷ From PY to PY, there was moderate variation in hospital rankings, with only 31 hospitals staying in the top 30% of the distribution and only 46 hospitals in the bottom 30% for every PY in the extension period.

Who are the top and bottom 30% of performers?



Episodes at hospitals in the top 30% involved patients who were slightly younger, were less likely to have diabetes, were less likely to be dually eligible for Medicaid, and had lower average HCC scores than episodes at hospitals in the bottom 30% (**Exhibit IV-8**). Hospitals in the bottom 30% tended to treat patients with moderately greater clinical complexity, which may have made it more challenging to keep episode spending below target prices. Although target prices are risk-adjusted for age, dual eligibility, and HCC count, bottom-30% hospitals still tended to have more patients with these higher-complexity characteristics.

Exhibit IV-8: The 30% of hospitals with the largest repayments over the extension period had a moderately more complex patient population on average, which may explain their financial performance

Characteristic	Top 30% hospitals	Bottom 30% hospitals
Fracture	11.3%	10.4%
Age, years	74.7	75.1
Dual eligibility	6.9%	8.2%
Diabetes	25.5%	28.6%
Obesity	32.5%	31.1%
HCC score	1.4	1.5
Beds	305.7	342.8
Nonprofit ownership	66.3%	71.9%

Notes: Top 30% hospitals were defined as hospitals that were in the 70th percentile or higher in terms of total net payment reconciliation over PY 6–8. Bottom 30% hospitals were defined analogously as hospitals in the 30th percentile or lower. Numbers reported are averages across hospitals.

CJR = Comprehensive Care for Joint Replacement; HCC = Hierarchical Condition Category; PY = performance year.

Source: CJR evaluation team analysis of Medicare claims and enrollment data for episodes that ended between October 1, 2021, and December 31, 2024 (PY 6–PY 8 intervention) as well as CJR payment contractor data for CJR participant hospitals in PY 6–PY 8.

V. Discussion and Conclusion

This chapter presents the eighth and final evaluation report of the CJR Model, focusing on the 3-year extension period (PY 6–PY 8). This period reflects model performance after key design updates, increased hospital experience with bundled payments, and broader shifts in technology and care delivery affecting LEJR episodes. In this chapter, we summarize the model's impacts on episode spending, quality of care, and Medicare savings, highlight important considerations for interpreting the results, and discuss broader implications for future episode-based payment models.

Summary of Findings



Across all LEJR episodes, the CJR Model generated an estimated \$180 M in net savings to Medicare during the extension period. Episode spending reductions accounted for over three-quarters of estimated savings, with the remainder reflecting repayments from hospitals that exceeded their target prices. Savings increased over time primarily because average hospital repayments to CMS grew from \$78 per episode in PY 6 to \$471 per episode in PY 8, even as episode-level spending reductions remained relatively stable.

Episode spending reductions were concentrated among elective episodes, which accounted for nearly 9 in 10 episodes treated under the CJR Model. CJR hospitals reduced total episode payments by about \$1,200 per elective episode during the extension period. This reduction, representing roughly 5% of baseline episode spending, reflects how episode-based accountability influenced care patterns, particularly for procedures where hospitals had the greatest ability to plan, coordinate, and manage recovery. Differences in PAC use drove reductions in elective episode spending, particularly reduced use of IRFs. CJR hospitals maintained quality of care as they changed PAC use patterns, including unplanned readmissions, ED use, complication rates, and mortality.

Considerations

The findings from the extension period reflect how the CJR Model operated amid ongoing changes in care delivery, episode composition, and Original Medicare enrollment. The considerations below highlight factors relevant for interpreting the evaluation findings, including

aspects of the evolving care environment and model design that may have affected the magnitude and variation of estimated spending reductions during the extension period.

Changes in the standard of LEJR care shaped the context under which the CJR Model achieved savings. We measured changes in spending during the extension period relative to a baseline that predated major changes affecting LEJRs, as well as disruptions associated with the COVID-19 pandemic. By the start of the extension period, advances in surgical techniques and anesthesia had already reduced procedural intensity and recovery time for many patients, and continued changes in care delivery and site of care influenced LEJR practices throughout PY 6–PY 8. Our results suggest CJR hospitals made substantial care redesign changes in early years in response to model incentives and then continued to refine care processes in response to external factors at a pace more similar to control hospitals. OP LEJR rates continued to increase, rising from roughly two-thirds of elective episodes in PY 6 to nearly four-fifths by PY 8, further shaping the care environment during the extension period. As a result, future episode-based payment models will operate against a different baseline standard of care, with implications for both the magnitude and sources of potential savings.

ASC growth occurred outside the CJR episode definition. The CMS Innovation Center did not include LEJR procedures performed at ASCs as episodes under the CJR Model. Medicare began paying for TKAs and THAs performed in ASCs in 2020 and 2021, respectively, and the share of procedures performed in ASCs increased during the extension period, reaching roughly 10% of TKAs and 7% of THAs in CJR MSAs by PY 8. As a growing share of lower-acuity elective LEJRs occurred in ASCs outside the episode definition, the remaining hospital-based episodes reflected a smaller set of cases for which CJR incentives could influence care patterns. CJR MSAs also tended to have lower ASC utilization than control MSAs; however, differences in ASC use between CJR and control MSAs were small and not statistically significant after risk adjustment. Thus, it is unlikely that differences in ASC growth substantially influenced the risk-adjusted evaluation findings.

CJR focused on Original Medicare during a time of rapid growth in Medicare Advantage (MA) enrollment. Between the start of the CJR Model (2016) and PY 8 (2024), the share of Medicare patients enrolled in an MA plan increased from 32.2% to 50.1%.¹⁸ Because the CJR Model applied only to Original Medicare beneficiaries, growth in MA enrollment reduced the share of LEJR patients subject to CJR incentives and likely altered the composition of episodes included in the evaluation over time. MA uptake also varied geographically, leading to different patterns of MA penetration across CJR and control MSAs. On average, CJR MSAs had higher MA penetration throughout the model duration, although the gap between the two groups narrowed over time.¹⁹

Although the evaluation adjusts for baseline differences between CJR and comparison populations, differential growth in MA enrollment across markets may have altered the Original

¹⁸ [Centers for Medicare & Medicaid Services. \(2025\). Medicare enrollment dashboard.](#)

¹⁹ MA Penetration rates for CJR and control MSAs can be found in **Appendix D: Additional Findings**.

Medicare population over time, potentially affecting the mix of patients, services, and costs observed during the model period. For example, enrollment in Special Needs Plans (SNP) for more medically complex or Medicaid dually enrolled beneficiaries grew rapidly during the extension period.²⁰ These MA plans were more prevalent in the South, a census region with relatively more control episodes than CJR episodes. Because MA penetration was initially lower in control MSAs and increased more rapidly over time, growth in SNP enrollment may have contributed to the narrowing gap in MA penetration between the control and CJR groups. If these plans captured a larger share of patients with higher complexity in the control group in this region, the remaining Original Medicare population contributing episodes for the control group may have become systematically less complex over time. In that scenario, average predicted spending in the control group would have been lower than it otherwise would have been, potentially leading the evaluation to underestimate the CJR Model's payment reductions.

While this or other scenarios are possible, we did not see any notable differences in observable characteristics between the CJR and comparison groups when examining changes in patient characteristics over time during the extension period, as presented in the [CJR Seventh Annual Report](#). The evaluation also incorporated geographic controls, including state-level fixed effects and episode-level risk adjustments to account for potential differences and changes in patient and episode characteristics.

CJR interacted with other value-based payment models. Many CJR and control hospitals were concurrently aligned with an Accountable Care Organization (ACO).²¹ While the CMS Innovation Center excluded LEJRs for Next Generation ACO Model and ENHANCED-track Shared Savings Program ACO patients from the CJR Model, CJR hospitals could participate in and work with ACOs. According to the 2021 American Hospital Association survey, approximately 67% of CJR hospitals that responded said they either led or partnered with an ACO.²² ACO incentives emphasize care coordination, management of post-acute care, and cost accountability across service lines, which may have influenced LEJR care alongside CJR incentives. In interviews conducted for the [CJR Sixth Annual Report](#), we found that concurrent participation in a Medicare ACO and the CJR Model resulted in more awareness and greater alignment toward value-based care among hospital staff. The evaluation controlled for patients being under an ACO, but our findings represent the CJR Model's effects within the backdrop of high ACO participation.

Some LEJR episodes at control hospitals were also included in the Bundled Payments for Care Improvement Advanced (BPCI Advanced) Model, accounting for 16.2% of control episodes during

²⁰ [Growth in Special Needs Plans Outpaces that of Medicare Advantage, Particularly in the South | KNG Health Consulting](#)

²¹ Overlapping ACOs include the Shared Savings Program (ongoing since 2012), the Pioneer ACO Model (2012–2016), the Next Generation ACO Model (2016–2021), and the Global and Professional Direct Contracting Model (2020–2022) and its successor, ACO REACH (beginning in 2023).

²² American Hospital Association. (2023). *American Hospital Association (AHA) Annual Survey Database - 2021*. Version 1. [2021 AHA Annual Survey](#)

the extension period. There was no similar overlap for LEJR episodes at CJR hospitals due to BPCI Advanced Model rules. We controlled for whether control episodes were included in the BPCI Advanced Model; however, broader hospital-wide care redesign activities associated with BPCI Advanced participation could have reduced observed differences between CJR and control hospitals, potentially leading to an underestimate of the CJR Model's impact.

Conclusion

Taken together, the findings from the CJR extension period show how a mature, mandatory episode-based payment model could reduce spending and maintain quality after multiple design refinements and amid ongoing changes in care delivery and the Medicare population. These results provide insight into the operation of episode-based accountability under mandatory participation and contribute to the broader evidence base on episode-based payment models, with relevance for subsequent mandatory models such as the Transforming Episode Accountability Model (TEAM).²³

The CJR Model achieved its goal of lowering costs while maintaining quality of care for LEJRs. CJR hospitals reduced the cost of elective LEJR episodes through care strategies that reduced discharges to institutional PAC settings and increased home-based care. CMS has finalized an expansion of the CJR Model as the Comprehensive Care for Joint Replacement Expanded (CJR-X) Model, citing that the CJR Model met the statutory criteria for expansion under section 1115A, based on evaluation results through PY 7.²⁴ The CJR-X Model will be mandatory nationwide and begin on January 1, 2028. This final evaluation further adds to the body of evidence that the CJR Model cost savings persisted throughout the entire extension period, reinforcing the model's sustained impact of reducing Medicare spending while maintaining quality.

The CJR Model demonstrated how mandatory participation can engage a broad and diverse set of hospitals. As one of the first large-scale, mandatory models tested by the CMS Innovation Center, the model operated at an unprecedented scope, encompassing roughly 9% (over 143,000) of LEJRs nationally across the extension period. The model's design intentionally incorporated a variety of hospitals, including safety-net hospitals, and required participation by hospitals that may not have otherwise opted into a bundled payment model. As a result, the evaluation was able to assess performance across a wide range of hospital types. While the CJR Model focused on higher-spending metropolitan markets, the CJR-X Model would extend the test of episode-based bundled payments nationwide, incorporating a broader set of markets.

The CJR Model fundamentally reshaped PAC culture, embedding early discharge planning and home-based recovery as standard practice. Over the past decade, PAC use for LEJR episodes evolved from routine reliance on institutional settings, primarily SNFs and IRFs, toward an expectation of discharge home with home health or OP PT or OT when clinically appropriate. Findings from this report, together with qualitative interviews from earlier reports, indicated that the

²³ For more information about TEAM, please visit the [TEAM web page](#).

²⁴ For more information about the CJR-X Model, please visit the [CJR-X web page](#).

CJR Model helped accelerate and solidify this shift by changing norms and expectations among surgeons, hospital staff, PAC providers, patients, and caregivers. This cultural change may have spread beyond participating hospitals. In prior interviews, providers at non-CJR hospitals that were part of the same hospital system but outside of the mandatory MSA reported similar changes in discharge planning practices and expectations for recovery at home.

The CJR Model informed ongoing and future episode-based payment models. The CJR Model's demonstrated ability to operate successfully as a mandatory episode-based payment model paved the way for subsequent mandatory models such as TEAM. By showing how mandatory episode-based payment can produce measurable change across diverse hospitals, the CJR Model contributed to the broader understanding of how these models can generate savings while maintaining quality of care. The CJR-X Model will expand the CJR Model nationwide, building on the lessons learned from the CJR Model and extending episode-based accountability for LEJRs to a broader set of hospitals and markets.