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Evaluation of the CMS
Comprehensive Care for Joint Replacement Model:
Performance Year 6

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This report presents the story of the Comprehensive Care for Joint Replacement (CJR) Model as a prime example of a value-based care model that spurs innovative approaches to care delivery:

- Overview how the CJR Model transformed care for joint replacements
- Delve into impacts of the CJR Model on payment, quality, and patient outcomes
- Peer into the key strategies leveraged by CJR hospitals
- Learn what elements of the model drove success

Whether you are shaping health policy, implementing programs, or advocating for patient-centered health care solutions, this report will give you evidence and insights you can use to drive meaningful improvements in health care delivery.

Interested in learning more about how and why hospitals transformed care?

Check out our special report exploring how and why CJR hospitals transformed care:

- **Drivers of Care Transformation | 35 pages**

In addition to this report, the following resources are available to get a quick snapshot of key findings or to dive deep into the performance year 6 evaluation:

- **Findings at a Glance | 2 pages**
  Concise visual summary of key findings
- **Executive Summary | 15 pages**
  Succinct overview of evaluation findings
- **In-Depth Report | 100 pages** Comprehensive evaluation findings and methodology

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- Lowering the cost of elective joint replacement episodes of care by shifting patients to less intensive post-acute care settings
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Linking accountability for quality and cost motivates innovative changes to care. This section highlights lessons from the CJR Model, including how requiring participation in value-based care can strengthen model impacts and the need for models to adapt to emerging needs.

The Comprehensive Care for Joint Replacement Model, a value-based care success story, reduced Medicare spending and maintained quality

The CJR Model: a value-based care success story

Value-based payment models seek to transform health care delivery for Medicare patients across the country. Value-based care has three key goals: better care for individuals, better health for populations, and reduced costs. The Comprehensive Care for Joint Replacement (CJR) Model is a prime example of a value-based care program that spurs innovative approaches to care delivery by encouraging greater coordination across care providers. Since 2016, the CJR Model has successfully reduced Medicare payments for joint replacement procedures while maintaining the quality of care for patients.

The CJR Model's origins trace back to the Bundled Payments for Care Improvement Initiative, an earlier value-based payment model that included knee and hip replacements. Providers that participated in the initiative could choose to be accountable for up to 48 hospital-based clinical episodes, one of which was joint replacements. In the early years of the initiative, providers successfully reduced costs for joint replacement episodes of care.[1]

The Centers for Medicare & Medicaid Services (CMS) developed the CJR Model in response to the initial success of the Bundled Payments for Care Improvement Initiative. The CJR Model differs from the Bundled Payments for Care Improvement Initiative by focusing solely on lower joint replacements and requiring participation of hospitals in selected metropolitan areas. Mandating participation by all hospitals in a region, not just highly motivated providers who volunteered to participate, allowed for a broad test of the CJR Model. It includes hospitals with varying levels of infrastructure, care redesign experience, treatment use and costs, and market positions.

The CJR Model successfully reduced joint replacement costs by over $1,000 per episode and maintained quality of care. These findings provide valuable lessons for Medicare and the broader health care market. Moving forward, CMS will use results from the CJR Model to inform the design of future models, including the proposed Transforming Episode Accountability Model, a mandatory model that also covers lower joint replacement procedures. This report describes how CJR transformed care to lower Medicare costs and preserve or improve quality, with a focus on results from the model's sixth performance year (October 2021 to December 2022).

> **"I think the 'CJR push' improved quality for all surgical patients."**
>
> – CJR Hospital

[1] Dummit, L. A., Kahvecioglu, D., Marrufo, G., Rajkumar, R., Marshall, J., Tan, E., Press, M. J., Flood, S., Muldoon, L. D., Gu, Q., Hassol, A., Bott, D. M., Bassano, A., & Conway, P. H. (2016). Association between hospital participation in a Medicare bundled payment initiative and payments and quality outcomes for lower extremity joint replacement episodes. *JAMA*, 316(12), 1267–1278. https://jamanetwork.com/journals/jama/fullarticle/2553001

CMS launched the CJR Model to encourage coordination across providers to manage costs.

The CJR Model requires hospitals in a set of randomly selected metropolitan areas to participate. Under the model, CMS holds participating hospitals accountable for the cost and quality of episodes of care for hip, knee, and ankle joint replacements. The payment calculation for an "episode of care" begins with the hospitalization for the joint replacement surgery and ends 90 days after discharge. By including this 90-day window, the episode captures follow-up care for the procedure, such as nursing facility, rehabilitation, or home health services, as well as the treatment of complications.

What are Joint Replacements?

Total joint replacement surgically removes parts of an arthritic or damaged joint and replaces it with a metal, plastic, or ceramic device, called a prosthesis, which replicates the movement of a normal, healthy joint.

By providing a target price for the entire episode of care, the CJR Model encourages hospitals to coordinate with other care providers, both before and after surgery, to better manage patient outcomes and costs.

Medicare provides hospitals with an average spending target for the cost of the surgical hospitalization and health care services over the following 90 days. Hospitals can earn additional money if they keep Medicare payments below the target price and meet Medicare quality standards. Starting in the second year of the model, hospitals were required to repay Medicare if their payments exceeded the target price. The CJR Model motivates providers to reduce unnecessary rehospitalizations, avoid complications, and optimize health care utilization during and after surgery to stay below the episode spending target.

CMS supports CJR hospitals' efforts to reduce payments and improve quality in several ways:

- Sharing relevant data on cost and health care use intended to support care redesign
- Offering to waive certain Medicare requirements, such as the requirement to stay in an inpatient hospital for at least 3 nights to qualify for post-acute care coverage, to encourage flexibility in care delivery
- Allowing participating hospitals to share best practices through a learning system

These resources enable collaboration among the health care providers who are responsible for the patient's full joint replacement episode, including surgeons, primary care physicians, physical therapists, and post-acute care facilities. This multidisciplinary approach supports continuity of care throughout joint replacement surgery and recovery, potentially leading to better outcomes and reduced complications.

> **We try to have or align ourselves with [post-acute care] providers that have the same goals that we do to provide quality care for patients at the right time at the right place in the right setting.**
>
> – CJR Hospital

The CJR Model not only motivated better coordination across providers but also encouraged innovation in protocols that guide how care is delivered and the pathways that define the patient's journey. For example, CJR hospitals implemented strategies to reduce patient risk before surgery, standardized surgical techniques, and used evidence-based rehabilitation protocols. Standardized treatment plans can help streamline processes and minimize unnecessary variation in care.

The CJR Model focuses on the most common surgeries that Medicare patients receive.

Over the past few decades, joint replacement surgeries in the United States increased substantially.[2] Advances in medical technology, including improvements in surgical techniques, materials used in implants, and postoperative care, made these procedures safer and more effective. Surgeons now use less invasive approaches, with smaller incisions and less tissue disruption. Most elective joint replacements can now take place in outpatient settings. These innovations lead to faster recovery times, less postoperative pain, and reduced risk of complications.

The aging U.S. population also contributes to the growing demand for joint replacement surgeries. Older adults have conditions that often require these procedures, such as osteoarthritis. Greater awareness of the benefits of knee and hip replacements, including improved mobility, pain relief, and a better quality of life, has led more patients and physicians to consider these surgeries as viable treatment options.

Roughly 1 million joint replacement procedures occur each year in the United States, and Medicare covers about 70% of them. Hospitals in metropolitan areas required to participate in the CJR Model perform around 40,000–50,000 joint replacements for Medicare patients annually, or 6–7% of all Medicare joint replacements.[3]

[2] Wolford, M. L., Palso, K., & Bercovitz, A. (2015). *Hospitalization for total hip replacement among inpatients aged 45 and over: United States, 2000–2010*. NCHS Data Brief, no. 186. National Center for Health Statistics. https://www.cdc.gov/nchs/data/databriefs/db186.pdf

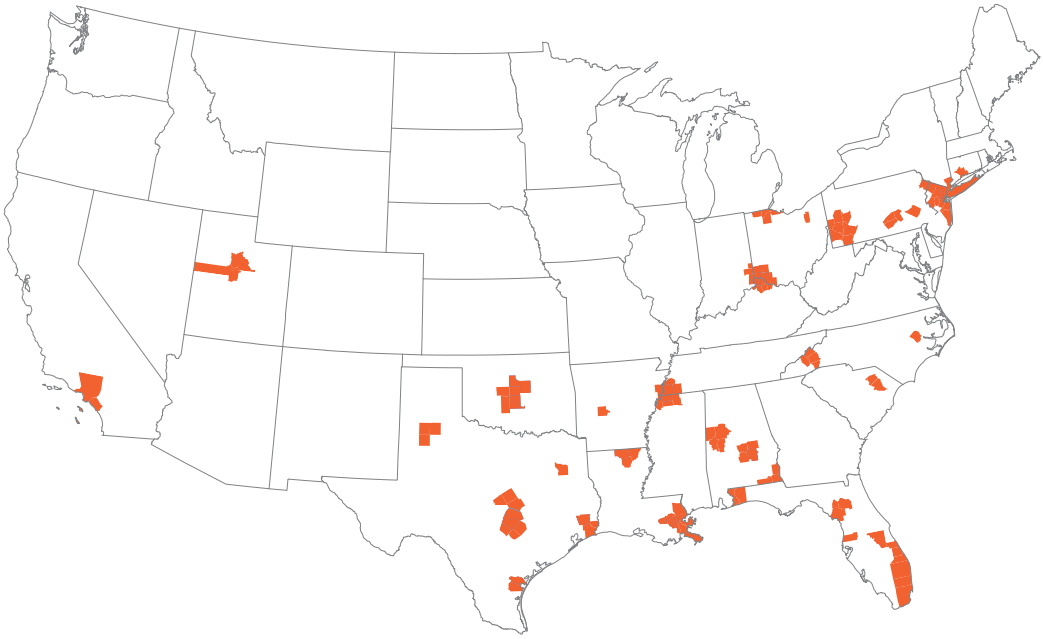
[3] Sloan, M., Premkumar, A., & Sheth, N. (2018). A projected volume of primary total joint arthroplasty in the U.S., 2014 to 2030. *The Journal of Bone and Joint Surgery, 100*(17), 1455–1460. https://doi.org/10.2106/JBJS.17.01617

The CJR Model required broad participation across diverse hospitals within 34 metropolitan areas.

53,000+ Joint Replacement Procedures

323 Hospitals

34 Metropolitan Areas



Providers could respond quickly to the CJR Model because the model was well aligned with other value-based models and trends in the marketplace.

When the CJR Model began, some hospitals reacted quickly to the model by leveraging existing partnerships and standardized care protocols or by streamlining existing value-based care initiatives in their hospital or system. Some hospitals already had policies and procedures in place at the start of the model that supported the CJR Model efforts because they participated in other value-based care programs or pursued credentials focused on high-quality and cost-effective care, such as Joint Commission Certification, Center of Excellence status, or Six Sigma training. Experience with managed care plans also helped hospitals prepare for the CJR Model by providing a blueprint for managing service use.

Overall, hospitals with relevant prior experience found new areas for improvement and redesigned care to succeed under the CJR Model more often than hospitals without relevant

experience. The hospitals that felt most prepared to succeed at the start of the CJR Model often credited their readiness to other payment and delivery models, such as the CMS Bundled Payments for Care Improvement Initiative and bundled payments from commercial insurers, other hospital initiatives, or affiliation with an Accountable Care Organization (ACO).

> **"Commercial bundles helped us prepare for CJR because of the alignment needed between physicians and hospital administration. Those bundles also helped us develop the care pathways a little more stringently to better manage risk."**
>
> – Care Redesign Leadership at CJR Hospital

Hospitals quickly learned to optimize post-acute care destinations to succeed under the model.

Post-acute care can occur in an institution or at home. Skilled nursing facilities and inpatient rehabilitation facilities provide intensive services to help patients recover and regain function so they can safely return home. Patients who do not require intensive services often go home and receive home health services and rehabilitation at appropriate facilities. Home health care providers work with patients in their homes to provide physical therapy to recover and regain function.

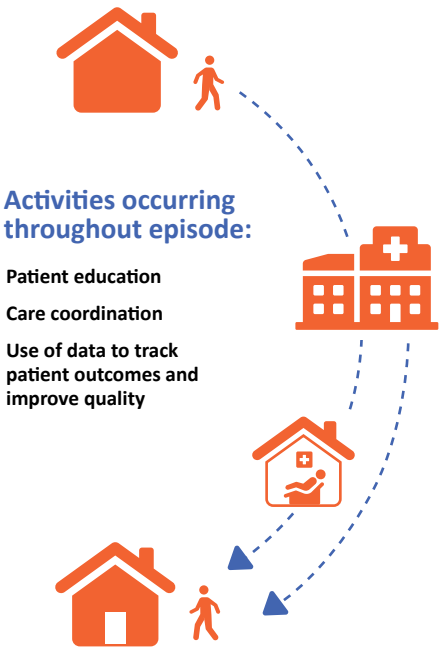
The CJR Model does not prescribe what hospitals should do to reduce joint replacement episode payments and improve quality of care. Hospital and physician leaders had to consider clinical and organizational factors, the potential for financial risk or opportunity, as well as internal and external resources in making the business case for whether and how to respond to the CJR Model.

Elective procedures make up the majority of joint replacements at CJR hospitals.

88%
Elective Procedures

12%
Fracture Procedures

Hospitals expanded their influence beyond the walls of their hospital to change care protocols and pathways before and after discharge.



Before Surgery

Mitigate risk and optimize patient outcomes for elective patients

Engaged patients well before the hospital admission to begin discharge planning, education, and identify high-risk patients for patient optimization to facilitate safe discharge home and optimize patient outcomes

Surgery

Reduce/maintain length of stay, optimize patients for safe discharge to lowest safe level of post-acute care

Early ambulation and changes to pain management and physical therapy to reduce length of stay, facilitate safe discharge home, and improve quality

Post-discharge and Recovery

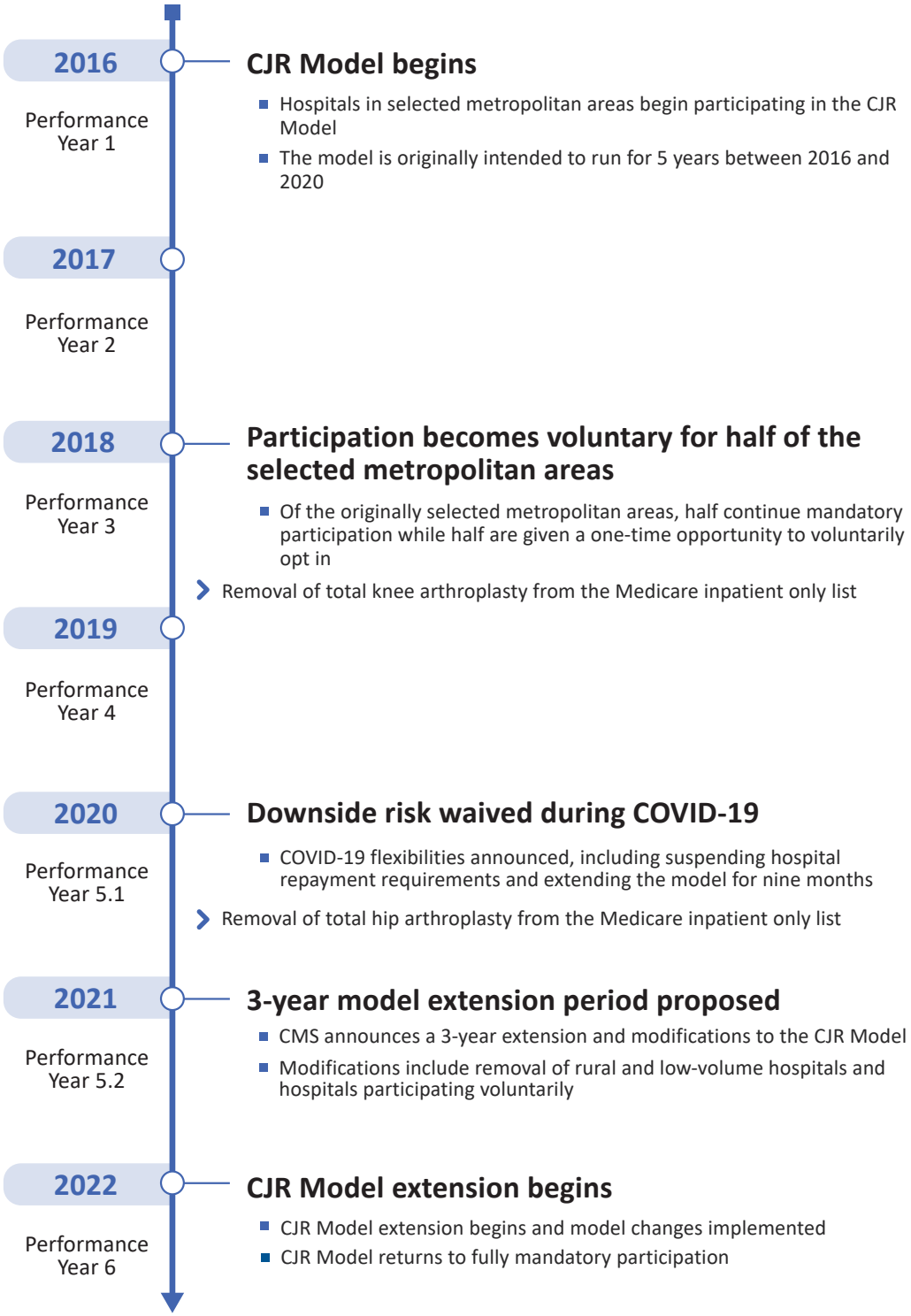
Reduce length of stay at skilled nursing facility, mitigate risk to readmissions

Increased coordination and communication with post-acute care providers, creation of preferred post-acute care networks, and longer period of patient follow-up to reduce length of stay in skilled nursing facilities and mitigate risk of readmissions

The CJR Model covers both elective and fracture joint replacements. The care pathways for elective surgeries and fractures differ. Providers can schedule and plan for elective surgeries for joint replacements. This planning allows providers to prepare patients for a smoother recovery after surgery by providing enhanced education, coordination, and setting discharge expectations. Hospitals have less discretion for hip fractures because these are often emergent, unplanned procedures where it is not possible to prepare in advance. The CJR Model evaluation looks at all joint replacements together as well as elective and fracture surgeries separately to better understand how the model affects the distinct care pathways.

Many CJR hospitals start discharge planning for elective joint replacement patients well before their hospital admission. Hospitals educate patients about what may be the most appropriate discharge destination based on their health status and social situation, including their physical home environment and caregiver availability. They also identify high-risk patients and create specific processes and protocols to limit complications, address risk factors, and reduce the need for intensive institutional post-acute care.

CMS made several policy changes to the CJR Model over time, including more significant changes in the sixth performance year.



CMS originally planned for the CJR Model to run for 5 performance years (2016–2020). Since the start of the CJR Model, CMS has changed several key features of the model design:

- Modified the mandatory metropolitan areas and the types of hospitals included in the model
- Improved the accuracy of payment calculations
- Added outpatient procedures to the model as the setting of joint replacement procedures changed
- Suspended hospital repayment requirements (known as "downside risk") during the COVID-19 pandemic

Changes in Medicare program payment policy and national care delivery patterns prompted a 3-year extension of the CJR Model. Extending the CJR Model allows CMS to gather more data and insights over a longer period, enabling a better evaluation of the model's effectiveness and identifying areas for further improvement.

The CJR Model reduced the cost of joint replacements while maintaining the quality of care, resulting in savings to Medicare.

CJR hospitals reduced the cost of joint replacement episodes by around $1,000, or 4%.

Hospitals participating in the CJR Model used various care transformation strategies before, during, and after surgery, mainly to reduce the use of costly postsurgical services. Hospitals could decrease spending for joint replacement episodes of care by sending more patients home for recovery after surgery instead of to post-acute care facilities. CJR hospitals reduced the cost of joint replacement episodes primarily by lowering spending in post-acute care facilities. Cost reductions occurred quickly; they were evident by the end of the first year of the model. CJR hospitals sustained significant, relatively constant cost savings through all 6 performance years.

During the first 5 performance years, reductions in spending on care delivered in skilled nursing facilities and inpatient rehabilitation facilities drove the overall reductions in episode costs. However, reductions in spending on skilled nursing facilities waned over time. In the sixth performance year, lower spending on inpatient rehabilitation facilities, roughly $571 less per episode, accounted for the largest reduction in spending.

CJR hospitals maintained the quality of care for joint replacements while reducing episode costs.

Despite reductions in episode costs and the use of post-acute care facilities, hospitals maintained the quality of care delivered to patients during joint replacement episodes. We observed no impact on unplanned readmissions to the hospital, visits to the emergency department, complications of the surgery, or mortality during the episode. We surveyed

patients at CJR and control group hospitals to gather their perceptions on the quality of their care. Respondents had similar self-reported improvements in function and mobility, similar levels of satisfaction with their overall recovery, and similar levels of help from their caregivers after returning home.

The updates to the CJR Model payment design resulted in savings to Medicare.

The CJR Model saved CMS an estimated $54.2 million during the sixth performance year. Cost reductions for joint replacements exceeded Medicare's reconciliation payments to participating hospitals. Multiple changes to model policies affected whether Medicare lost or saved money over the life of the model. CMS made several changes based on knowledge gained during the model, such as adjusting target prices for trends to better capture changes in Medicare program payments and care delivery over time. Other changes were in response to external events, such as eliminating hospital repayments and downside risk during the COVID-19 pandemic to ensure providers were not put at risk during the public health emergency. Among hospitals mandated to participate, the model achieved projected savings in all performance years except during the pandemic.

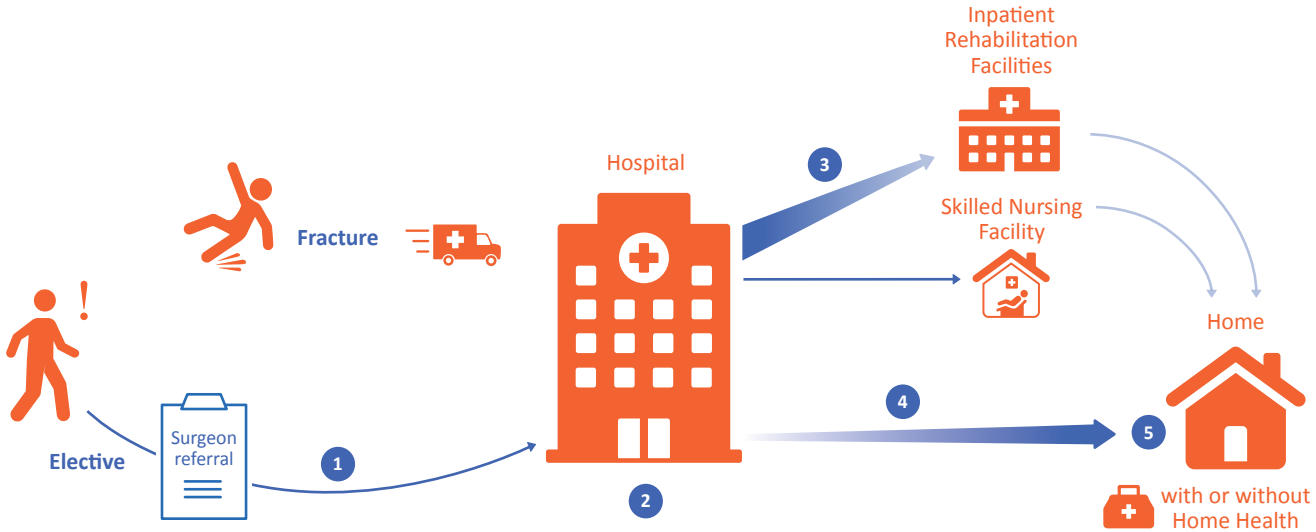
Overall, the CJR Model is a success story for how a mandatory value-based care model can benefit Medicare patients and help CMS achieve its goals. In the next section, we provide more information on how the model motivated hospitals to transform care, reduced spending on joint replacement, and generated savings to Medicare while maintaining the quality of care.

The CJR Model helps CMS achieve its goals by encouraging hospitals to redesign care across the joint replacement care pathway

The CJR Model transformed care for joint replacements

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 presurgery education programs and prescribed physical therapy before and after surgery. They also revised postdischarge strategies and strengthened provider relationships to reduce institutional stays and get patients home sooner after their surgery.

CJR hospitals redesigned care for joint replacements before and after surgery and discharged more patients home safely, leading to lower costs while maintaining quality.



PRE-SURGICAL	SURGERY	POST-DISCHARGE & RECOVERY
1 CJR hospitals increased patient education, physical therapy, and patient optimization before surgery	2 Increased early ambulation, physical therapy, and pain management, and facilitated safe discharge home	3 Decreased the number of patients sent to inpatient rehabilitation 4 Increased the number of patients discharged home with home health 5 Followed up with patients in the 90 days post-discharge

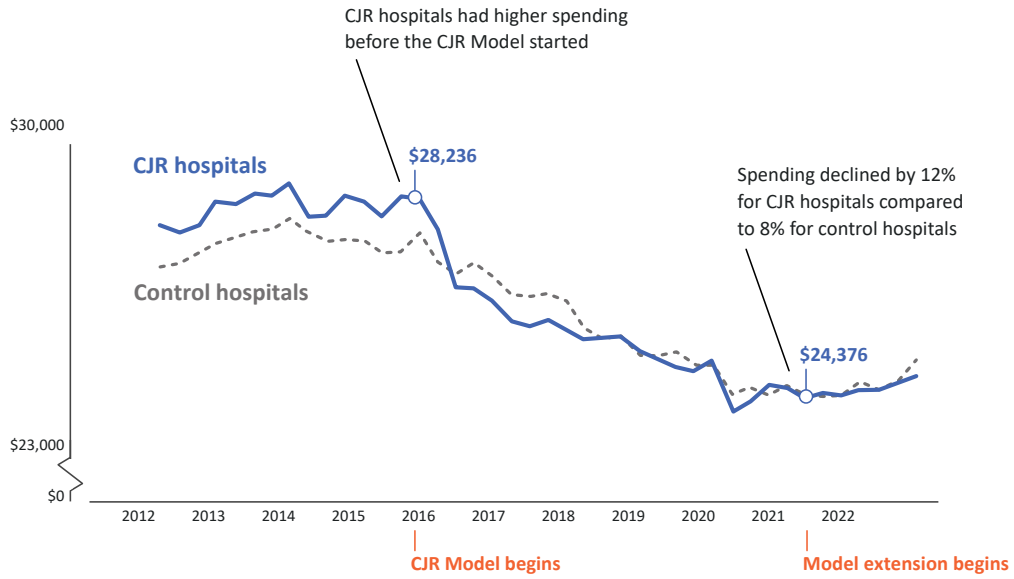
IMPACT

Moving patients to less intensive care settings and redesigning care led to lowered costs while maintaining quality

CJR hospitals reduced the cost of elective joint replacement episodes by discharging fewer patients to institutional settings.

Average costs of joint replacement episodes dropped from around $28,000 in 2016 to about $25,000 in 2022, for both CJR and control hospitals. Despite the drop in costs for both groups, CJR hospitals reduced payments by a greater amount than the control group hospitals did in each year of the model.

CJR hospitals reduced the average cost of 90-day joint replacement episodes during a period when joint replacement costs were falling nationally.



How the Evaluation Measured Model Impacts

We compared changes in costs and use of care services for the randomly selected CJR hospitals with corresponding changes for unselected control group hospitals to determine the model's impact. We measured changes between the baseline period (roughly 2012–2015) and the latest model performance period (October 2021–December 2022). The difference in the changes between the two groups represents the impact of the CJR model. This approach, called "difference-in-differences," accounts for influences that affect both the CJR hospitals and the control hospitals. Our impact models also control for other market, patient, and provider factors that are known to affect impact estimates.

CJR hospitals reduced the cost of joint replacements by around $1,000, or 4%, per episode of care.

Cost reductions occurred quickly and were evident by the end of the first performance year. The reductions in episode costs remained stable over the 6 performance years. Reductions in inpatient rehabilitation facility payments of $571, or 25.9% of payments in the CJR baseline period, drove the reductions in episode payments across the CJR patient population. Decreases in readmission payments and Part B payments also contributed to payment reductions.

For the elective patient population, which represents around 88% of all joint replacements, the estimated payment reduction was similar to the reduction we found for the full joint replacement population. For elective episodes, the CJR Model lowered joint replacement costs by an average of $1,171, or 4.5%, between the baseline period and the latest performance year. A reduction in inpatient rehabilitation facility payments of $410, or 25.1% of baseline period payments, contributed to the lower payments for elective procedures.

Hospitals engaged with patients at all stages of care to reduce institutional care and better prepare them for a safe discharge home.

Hospitals increased their focus on patient education and efforts to reduce patient risks. Providers identified high-risk patients and enrolled them in programs that mitigated risk factors, such as weight or tobacco use, to improve outcomes and recovery. Hospitals also provided physical therapy earlier and more often, used data to inform clinical decision-making, and worked with surgeons and post-acute care provider partners to adopt more efficient practices. Such strategies helped shift care away from more expensive settings, such as skilled nursing facilities and inpatient rehabilitation facilities, and toward less expensive but appropriate options, such as home health care. These care transformation efforts are one factor that may have caused reductions in inpatient rehabilitation and joint replacement costs, particularly for elective surgery patients.

As an unexpected surgery, hospitals cannot engage fracture patients in the same presurgical care activities that they use with elective patients.

The CJR Model did not have a significant impact on average joint replacement payments for fracture patients. Hospitals may not be able to apply the strategies that are effective in reducing costs for elective patients to patients facing unexpected, acute surgeries.

Although total costs were unchanged, we still saw evidence that patients were directed away from the most intensive and expensive forms of post-acute care, with no effect on quality. In the sixth performance year, CJR episodes had large decreases in inpatient rehabilitation facility payments of $1,476, or 27.3%, and increases in skilled nursing facility payments of $1,575, or 9.4%, for fracture patients. This pattern suggests that fracture patients are going to skilled nursing facilities instead of inpatient rehabilitation. This is the first year that we have observed increases in skilled nursing facility payments for fracture patients. In the first 5 performance years, we found reductions in skilled nursing facility payments, although declines started to wane after the second performance year. However, findings for fracture patients merit less confidence than other findings in this report due to differences in fracture costs between CJR and control hospitals that preceded the CJR Model.

Care for fracture patients

We conducted separate analyses for elective joint replacements and joint replacements due to fracture because of their different care pathways and underlying costs. Fracture patients are on average 10 years older and have more comorbidities than elective patients.

CJR hospitals maintained the quality of care for patients with joint replacements.

The CJR Model aims to reduce Medicare costs and improve or maintain the quality of care for Medicare patients who receive joint replacements. To capture the full breadth of quality of care for these patients, our evaluation incorporates measures of quality based on health care claims as well as interviews and surveys.

Being financially responsible for a 90-day period after surgery encourages hospitals to reduce complications that could lead to potentially avoidable service use. The main claims-based measures of quality of care include mortality, emergency department visits, unplanned readmissions, and complications from the procedure within 7 days of discharge from the hospital. On average, across all joint replacements, we did not observe differences between CJR and control hospitals for any of the quality measures, indicating that the CJR Model maintained quality of care.

We used a patient survey to measure self-reported function, pain, care experience, and caregiver help needed for joint replacement patients. The survey showed similar self-reported quality outcomes in the CJR and control groups, which suggests the CJR Model did not affect patient-reported outcomes.

How the Evaluation Captured the Patient Perspective

We developed the CJR patient survey to explore differences between CJR and control patients in function and pain, need of caregiver help, care experience, and overall satisfaction at the end of the episode. The patient-reported outcomes in the survey captured information not available from other data sources, such as claims or assessment data. In contrast to our other data, this survey has no baseline period and measures the effect of the CJR model relative to patients at the control hospitals in the CJR period.

Hospital administrators and clinicians considered ways to transform care across the joint replacement episode in response to the CJR Model incentives.

We asked 34 hospitals about the patient and caregiver experience under the CJR Model and the CJR Model's impact on quality of care. Hospitals were chosen from 10 randomly selected metropolitan areas that participated in interviews or site visits. Many hospitals felt they had to ask more of patients and caregivers under the CJR Model, for example, by having them participate in presurgical education or increasing caregiver responsibilities. But they also thought these changes made patients more comfortable and engaged with the process. Some hospitals noted that even by expecting more caregiver responsibilities and shorter stays, patients were more confident and less anxious going into surgery. Many hospitals also created preferred provider networks, partnering with post-acute care providers that met high-quality standards and would share patient outcomes and service use data with the hospital. These partnerships were meant to increase the use of high-quality post-acute care, reduce the length of institutional stays, and decrease hospital readmissions.

They know what's expected and so they are better prepared to work with us to meet those expectations. I think that's the biggest difference I've seen with patients who are in the program.

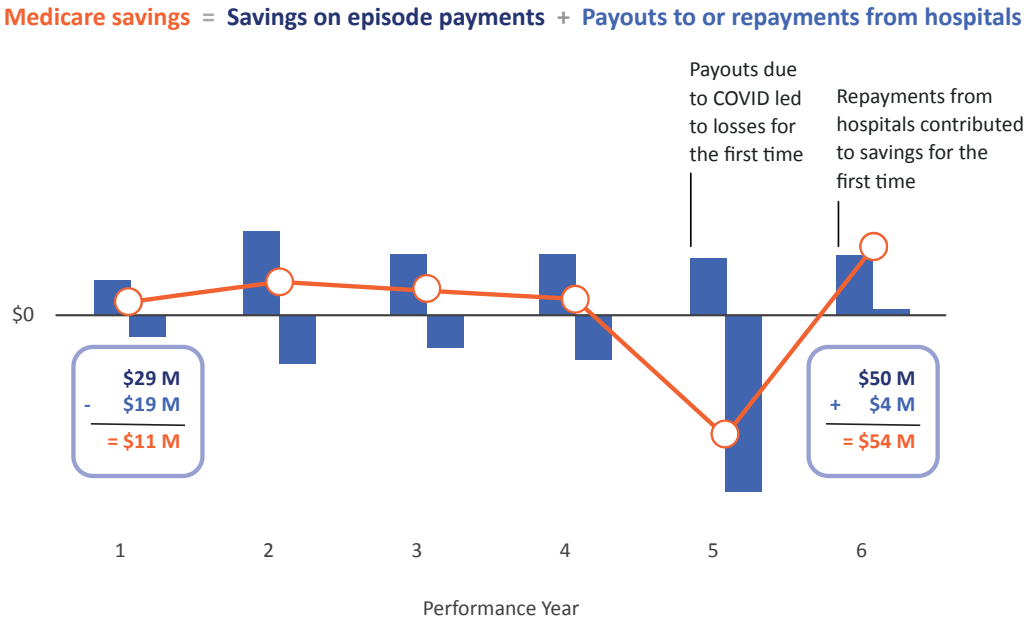
– Physical Therapist at Home Health Agency

Taken together, these findings suggest that the CJR Model led to considerable transformation in care delivery. Although many of these changes aimed to improve quality of care, hospitals at least maintained the quality of care for joint replacements while reducing costs.

Cost reductions for joint replacements exceeded total incentive payments to providers, resulting in savings to Medicare.

Savings to Medicare are important in considering the potential for expanding the model. Savings occur when reductions in the costs of care are larger than the incentive payments that CMS makes to providers. In the first 4 performance years, CJR hospitals reduced the episode costs by a larger amount than CMS allotted to hospitals in incentive payments, leading to net savings to Medicare. In the fifth performance year, temporary flexibilities offered in response to the COVID-19 public health emergency led to a net payout to hospitals more than 3 times larger than in prior years. The large payout to hospitals in the fifth performance year offset savings that Medicare accrued across prior years. In the sixth performance year, those flexibilities expired, and the model led to savings once again. In total, the model saved an estimated $30.8 million in the first 6 years and $54.2 million in the latest performance year alone. The $54.2 million in total savings translates to $1,017 in savings per joint replacement.

The CJR Model returned to its prior pattern of saving Medicare money, with $54.2 million in savings in the sixth performance year.



The latest payment policy changes resulted in a nearly 50-50 split between participants that earned incentive payments and those that owed money to Medicare.

The sixth performance year was the first time that CJR hospitals made net repayments to CMS for episodes of care. On average, hospitals repaid Medicare $78 per episode, for a total of $4.2 million. This average repayment, however, hides a striking distribution across CJR hospitals. About half of the hospitals (161) made repayments to CMS, totaling $33.6 million repaid, while the rest (146) received reconciliation payments, totaling $29.4 million received. The 10% of hospitals with the largest repayments collectively paid CMS $19.3 million. The 10% of hospitals with the largest reconciliation payments collectively received $18.6 million from CMS.

Hospitals that repaid Medicare had a higher proportion of underserved patients and were more likely to be safety-net hospitals. Interviews with six safety-net hospitals revealed insights on the financial burden of the CJR Model. These hospitals were limited in their ability to engage in common CJR Model care transformation strategies because of the needs of their patient population, which they described as highly complex, with ongoing unmet medical and nonmedical needs. In particular, they found it difficult to reduce the use of institutional care after discharge and focus efforts on earlier discharge home. Hospitals were concerned about their financial prospects in the model. They said the CJR Model target prices were "too low" and did not reflect the high costs of care for their complex patient population. This emerging evidence comes from a relatively small sample of hospitals; more discussions with a larger group of safety-net hospitals would help us better understand the broad impact on these providers. While the design of the CJR Model did not explicitly include health equity incentives, the evaluation will continue to monitor implications for underserved populations and the providers that serve those patients.

The CJR Model lowered costs for joint replacements—mainly by shifting patients to lower levels of care and sending more people home after discharge from the hospital—and ultimately resulted in net savings to Medicare. At the same time, the model succeeded in maintaining quality of care. In the final section of this report, we discuss the market factors that affect the CJR Model and conclude with a description of the lessons learned from the model to date.

How CMS sets target prices for joint replacements

CMS assesses whether participant hospitals have met financial and quality targets through a reconciliation process after the end of each model performance year. At reconciliation, CMS compares each hospital's total payments for services during the joint replacement episode to its quality-adjusted target price. Hospitals may receive an additional payment from Medicare ("reconciliation payment") if they meet quality targets and have payments below target prices. Hospitals with payments that exceed target prices may need to repay Medicare a portion of the payments for the total episode of care.

The evaluation considers the CJR Model's success in the broader health care landscape

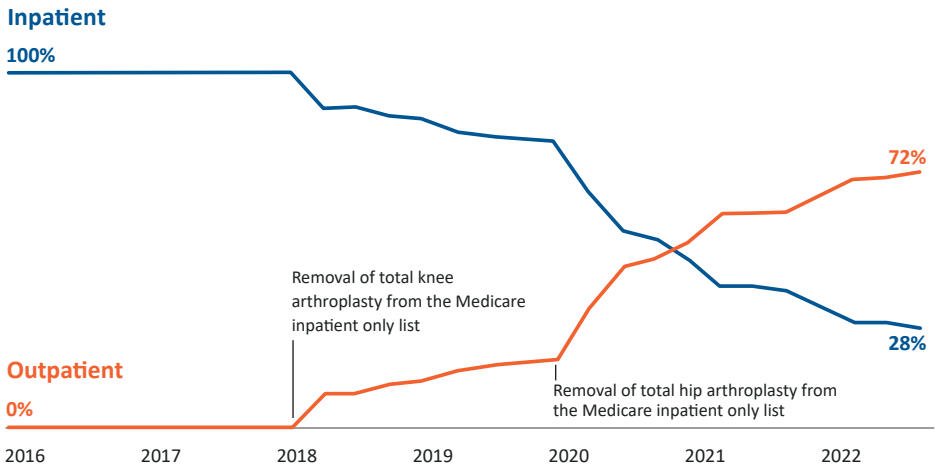
The CJR Model exists in a rapidly evolving healthcare landscape

Changes in the broader health care landscape have affected both the operations of participating CJR hospitals and the measured impacts of the CJR Model. Understanding these effects can inform the interpretation of findings and the design of future evaluations.

Joint replacements have rapidly shifted from inpatient to outpatient settings since the CJR Model began.

Medicare began covering outpatient knee replacements in 2018. Since that time, inpatient joint replacements have steadily declined, but outpatient procedures have grown faster, resulting in more procedures overall. Greater use of the outpatient setting likely reflects both provider and patient preferences to avoid an overnight stay in the hospital. The COVID-19 pandemic rapidly accelerated this shift as patients avoided hospitalizations and stays in skilled nursing facilities.

Hospitals have rapidly shifted patients setting away from inpatient settings, with the majority of procedures now being performed in outpatient settings.



The CJR Model did not initially include outpatient procedures. Shortly after Medicare began covering outpatient procedures, CJR hospitals shifted toward performing hip and knee replacements in outpatient settings, but at a slower pace than control hospitals. CJR hospitals may have been uncertain about whether and how CMS would add outpatient procedures to the model, and the exclusion of outpatient procedures from model incentives might have deterred CJR hospitals from moving toward outpatient care.

Medicare added procedures performed in an outpatient setting to the CJR Model in 2021. CMS also introduced site-neutral pricing to encourage hospitals to perform more procedures in an outpatient setting, where, presumably, they could generate more net revenue from the surgery. That year, CJR hospitals performed more than 70% of elective joint replacements in the outpatient setting. The number of outpatient elective joint replacements continues to rise, and CJR hospitals have narrowed the gap in their use of this setting relative to control hospitals over time.

The growth in outpatient procedures changed the care journey for patients undergoing hip and knee replacements. Less invasive and less intensive surgery reduced the use of skilled nursing facilities and increased discharges to home with rehabilitation services. Even as procedures shifted to less intensive settings, CJR providers continued to drive better value than their counterparts—providing lower cost care while maintaining quality—and retained strong patient satisfaction and positive experiences with rehabilitation.

The increase in outpatient procedures marked a natural shift to less intensive care settings and reductions in institutional care. With the inclusion of outpatient procedures in the CJR Model, participating hospitals found even greater opportunities to provide better value care for patients. This example highlights how episode-based payment models, which establish cost and quality targets but allow providers to adapt to new opportunities, can be successful in an environment of ever-advancing medical care.

The CJR Model interacts with other value-based care initiatives.

The CJR Model exists in a rapidly evolving health care landscape that includes other value-based payment models and programs. Some of these initiatives preceded the CJR Model, and many others have started since the CJR Model began.[4] While the specific features vary, many of the goals are the same:

- Addressing fragmentation in care delivery
- Reducing health care costs while improving patient outcomes
- Fostering partnerships with payers, purchasers, providers, and states to achieve equitable outcomes
- Integrating patient perspectives

We consider how these models interact to provide context to our findings and understand how the greater health care landscape is evolving. Knowing how these models interact is also necessary for isolating the direct impact of the CJR Model and helps identify potential additive or dampened effects. For example, in some cases, participants can meet the goals of multiple models with the same activities without an incentive to make additional changes.

[4] Fowler, E., Rudolph, N., Davidson, K., Finke, B., Flood, S., Bernheim, S. M., & Rawal, P. (2023). Accelerating care delivery transformation—The CMS Innovation Center's role in the next decade. *NEJM Catalyst Innovations in Care Delivery, 4*(11), CAT-23. https://catalyst.nejm.org/doi/10.1056/CAT.23.0228

The Bundled Payments for Care Improvement Initiative preceded the CJR Model and prepared some hospitals for bundled payments, including for hip and knee joint replacements. The Bundled Payment for Care Improvement Advanced Model began in October 2018 and also includes 90-day episodes of care for joint replacements. Combined, these three bundled-payment models have had a large footprint and influenced the greater health care landscape for hip and knee joint replacements. For instance, we have learned from CJR hospitals that they spread best practices developed under the CJR Model to other hospitals in the same health system.

Each model also has specific rules for overlap and participation, which must be considered when studying the impact of the specific models. For example, CJR hospitals cannot participate in the joint replacement episode under the Bundled Payment for Care Improvement Advanced Model, but hospitals in the CJR Model's control group can participate. We use statistical approaches to account for different factors that may influence model impacts, but isolating the effects of a single model is challenging when the reach of value-based care initiatives is growing.

The number of ACOs, another value-based care model with care coordination incentives, has increased over the past decade as CMS aims to foster accountable care relationships for 100% of Medicare patients by 2030. The evaluation captures information on overlap between the CJR Model and ACOs to understand how these value-based payment models coexist and prompt similar behavior. During the sixth performance year, almost a third of CJR hospitals participated in the Medicare Shared Savings Program through an aligned ACO.

The evaluation uses a randomly selected control group

For the CJR Model, 171 metropolitan areas were eligible to participate. Of the 171 metropolitan areas, 67 were randomly selected to be participants in the model, and the evaluation used the remaining metropolitan areas to make up the control group for the model test. As CMS updated participation requirements over time—changing the list of mandatory metropolitan areas, adding voluntary participation, and then removing voluntary participation—the evaluation has developed the equivalent "mandatory" group of control hospitals to study the impact of mandatory CJR hospitals.

In interviews, hospitals that participated in both a Medicare ACO and the CJR Model indicated that the two programs are aligned, require common care redesign strategies, and increase awareness of value-based care among hospital employees. Most hospitals viewed the goals of ACOs and the CJR Model as similar, stating that both programs share the same dual aims to improve quality of care for patients while reducing expenditures. Common strategies that hospitals employed in both programs include using data, such as patient medical history, readmissions data, ACO patient quality data, and ACO population-level data, to inform care pathways, strengthen care coordination, and monitor patient outcomes. To ensure alignment with program goals and adopt value-based care initiatives, hospitals made efforts to educate hospital staff, executive leadership, and post-acute care providers. Participating in value-based care programs resulted in a mindset change at hospitals by increasing physicians' awareness of quality throughout the episode, improving their understanding of social determinants of health, and increasing the focus on potential economic impacts.

> **"We're pulling all the same levers. Ensuring that the patient is going to the appropriate next site of care, utilizing performance networks, monitoring patient length of stay at skilled nursing facilities, and monitoring the patients for readmission. The key operational levers are the same across the programs because the goals of the programs align."**
>
> – Assistant director of post-acute care at a Medicare Shared Savings Program participant hospital

The CJR Model's success provides important lessons

What drove the CJR Model's success?

Since 2016, the CJR Model has succeeded in lowering CMS spending while maintaining patient quality of care for lower joint replacements. In the absence of initiatives like the CJR Model, the growing number of these procedures performed annually could represent excessive increasing costs to Medicare as the population ages. The lessons learned from the CJR Model may prove useful to CMS as it tests new value-based payment models and considers broader changes to payment policies.

Accountability for quality and cost motivated innovative changes to care.

The CJR Model provides evidence that payment incentives that hold providers financially accountable for a well-defined and clinically meaningful episode can motivate transformative changes to patient care. Hip and knee replacements require significant post-acute and rehabilitation care. By making hospitals accountable for rehabilitation, providing them with data about the use and cost of care beyond the hospital stay, and allowing them to share in the savings to Medicare, the CJR Model gave providers both the means to drive better value and the incentive for doing so.

Although the model held hospitals accountable for the cost and quality of joint replacements during the surgery and the 90 days after, hospitals changed care delivery before surgery to better prepare patients for discharge home after surgery. Hospitals worked with patients before admission to educate them on self-care, plan their discharge, and optimize the patient's path to recovery. Hospitals encouraged light activities, such as standing or walking, earlier after the procedure and incorporated pain management and physical therapy to increase safe discharges home. After the surgery, hospitals increased patient follow-up and improved coordination with institutional providers.

CMS aims to foster accountable care relationships for 100% of Medicare patients by 2030. Accountable care requires a doctor, group of health care providers, or hospital to be responsible for total costs of care and improving quality of care, care coordination, and health outcomes for a defined group of patients.[5] The success of the CJR Model in transforming care during a well-defined episode can serve as a building block toward broader accountability for patient care.

[5] Fowler, E., Fogler, S., Schreiber, C., Waldersen, B., Kehoe, G., Roiland, R., Wolf, S., Goldman, A., & Rawal, P. (2024). The CMS Innovation Center's strategy to support person-centered, value-based specialty care: 2024 update. *Health Affairs Forefront*. https://www.healthaffairs.org/content/forefront/cms-innovation-center-s-strategy-support-person-centered-value-based-specialty-care

Requiring hospital participation in the CJR Model strengthened the impact.

By mandating participation, the CJR Model includes hospitals that reflect the full range of hospitals serving Medicare patients. CJR participants have varying levels of infrastructure, care redesign experience, treatment use and costs, resources, and market positions, and they serve socially, ethnically, and geographically diverse patients. Broad reach into the marketplace allows policymakers to see more clearly how the CJR Model, or similar value-based care initiatives, could extend to a larger share of the Medicare population. It also ensures that we learn how value-based care initiatives affect underserved patients and potentially disadvantaged providers that participate less in voluntary models.

The CJR Model confirmed that a mandatory model, with broader hospital representation, could generate substantial savings and optimize post-acute care for patients. Future initiatives should consider the success of the mandatory component of the CJR Model in achieving Medicare savings.

CMS adapted the CJR Model to address emerging needs.

CMS has adapted the CJR Model's design to respond to changes in the broader health care environment or to improve the model's chance of achieving its goals. CMS can modify a mandatory model like the CJR Model through notice, comment, and rulemaking. For example, CMS decided to include joint replacements performed in the outpatient setting in the CJR Model after widespread changes in practice.[6]

CMS has altered payment policy in the model—for example, how CMS determines the target prices that hospitals try to achieve and how it shares the gains, or losses, on joint replacements with participating CJR hospitals. These rules affect the amount of financial risk that hospitals may face, due to factors they can control and those they cannot. The rules also affect the distribution of winners and losers under value-based care.

For example, during the COVID-19 pandemic, when hospitals experienced great operating and clinical pressure, CMS did not require them to make repayments to Medicare if their costs exceeded targets. During this time, CJR hospitals continued to reduce spending for joint replacements by 4% annually, primarily by sending more patients home for recovery after surgery instead of to post-acute care facilities.

CMS' flexibility to adjust the model over time includes the ability to refine the methods for setting target prices, a complex and challenging aspect of bundled payment models. A few years into the model, CMS became concerned that the initial baseline used to generate target prices

[6] Medicare Program: Comprehensive Care for Joint Replacement Model Three-Year Extension and Changes to Episode Definition and Pricing; Medicare and Medicaid Programs; Policies and Regulatory Revisions in Response to the COVID-19 Public Health Emergency, 86 F.R. 23496 (Final rule effective July 2, 2021) https://www.federalregister.gov/documents/2021/05/03/2021-09097/medicare-program-comprehensive-care-for-joint-replacement-model-three-year-extension-and-changes-to

would lead to losses to Medicare under the CJR Model.[7] Starting in the sixth performance year, CMS changed the payment methodology to improve the accuracy of payments by adjusting the baseline and accounting for patient characteristics in target prices. As a result, the model managed to recover the projected losses for CMS.

The payment methodology inherently results in some hospitals that win while others lose under the CJR Model. CMS wants to ensure an accurate, transparent, and fair distribution of gains and losses. CMS applied payment methodology changes in the most recent performance year to try to improve the accuracy of target prices. We found that these changes shifted the distribution of reconciliation payments and repayments toward more repayments, while keeping the "winners" and "losers" in similar relative positions. The average hospital had to repay Medicare a small amount, but the changes were likely felt most acutely by the least successful hospitals, which are now responsible for an increasingly large repayment amount. Interviewees from a small sample of safety-net hospitals raised concerns about the financial impact of the model on their hospital. They did not think target prices adequately account for complex patient populations, particularly those with unmet nonmedical needs.

Understanding the differing effect that payment policy changes may have across the broad spectrum of CJR participants is important. While the CJR Model's initial design did not explicitly include health equity incentives, the evaluation will continue to monitor unintended effects on safety-net providers and historically underserved populations.

[7] Smith, B. (2021). CMS innovation center at 10 years-progress and lessons learned. *New England Journal of Medicine, 384*, 759–764. https://doi.org/10.1056/nejmsb2031138