

## **Kidney Care Choices (KCC) Model**

Second Annual Evaluation Report,  
Performance Year 2023



### **PREPARED FOR**

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# **Kidney Care Choices (KCC) Model: Second Annual Evaluation Report, Performance Year 2023**

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## **DISCLAIMER:**

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## 1. Introduction

The Centers for Medicare & Medicaid Services (CMS) Center for Medicare and Medicaid Innovation (Innovation Center) launched the Kidney Care Choices (KCC) Model on October 15, 2020, and the first performance year started on January 1, 2022. The KCC Model is a voluntary model that aims to slow the progression of chronic kidney disease (CKD), and increase the use of home dialysis, and increase kidney transplantation while also reducing Medicare expenditures and preserving or enhancing quality of care for patients. CMS designed the KCC Model and the mandatory End-Stage Renal Disease (ESRD) Treatment Choices (ETC) Model to work in concert, with the goals of engaging participating providers and patients by creating incentives spanning a range of clinical opportunities for improvement. CMS has extended the Comprehensive Kidney Care Contracting (CKCC) model option under the KCC Model to operate through December 31, 2027; the CMS Kidney Care First (KCF) model option ended early on December 31, 2025.<sup>1</sup>

Acronyms	
<b>CKCC</b>	Comprehensive Kidney Care Contracting
<b>CKD</b>	chronic kidney disease
<b>CMS</b>	Centers for Medicare & Medicaid Services
<b>ESRD</b>	end-stage renal disease
<b>ETC</b>	ESRD Treatment Choices
<b>KCC</b>	Kidney Care Choices
<b>KCE</b>	Kidney Contracting Entity
<b>KCF</b>	CMS Kidney Care First
<b>PY</b>	performance year

CMS contracted with The Lewin Group and Lewin’s partners, the University of Michigan Kidney Epidemiology and Cost Center and Arbor Research, to evaluate the KCC Model. The evaluation research questions focus on determining whether the model achieves its primary objectives:



For this second annual evaluation report, we examined KCC Model effects during Performance Year (PY) 2023. We employed a mixed-methods evaluation design, incorporating both quantitative and qualitative data to assess model impacts. We used CMS data and data from patient surveys, including responses from readily available surveys as well as surveys fielded by the evaluation team, to conduct quantitative analyses. In addition, we collected qualitative data from interviews and site visits with participating providers, informed by insights from our Patient Advisory Group and KCC Participant Implementation Survey (described in the first evaluation report<sup>2</sup>).

<sup>1</sup> Centers for Medicare & Medicaid Services. (2025). *Kidney Care Choices Model Performance Year 2026 model update – quick reference*. <https://www.cms.gov/kidney-care-choices-model-performance-year-2026-model-update-quick-reference>

<sup>2</sup> The Lewin Group. Kidney Care Choices (KCC) Model first annual evaluation report, Performance Year 2022. Prepared for the Centers for Medicare & Medicaid Services. <https://www.cms.gov/kcc-model-eval-ann-rpt-1>

This evaluation report builds on the first one by adding results for a second and final cohort of participants that joined in PY 2023. We also provide several new measures, analyses, and insights:

- Expanded set of payment, quality of care, and transplant measures
- Additional KCC-level impacts
- New analyses focused on the model’s impact on relevant patient subgroups
- Takeaways on patient-reported care experiences and quality of life from three surveys fielded by the evaluation team
- Key themes related to participant experiences with implementing the model from interviews and site visits

### 1.1. Overview of the KCC Model

Nephrologists, other nephrology professionals, transplant providers, and dialysis facilities can voluntarily join the KCC Model to work toward improved care delivery for Medicare fee-for-service patients with advanced CKD. KCC has two model options: KCF and CKCC. These options include some similar incentives but differ in the characteristics of eligible providers and the level of risk borne under each option (see **Exhibit 1** and **Appendix B**<sup>3</sup>). CMS announced in May 2025 that the KCF model option would end December 31, 2025, and that the CKCC model option would end December 31, 2027.<sup>4</sup>

The model includes Medicare fee-for-service patients with CKD Stage 4 or 5 and patients with ESRD on dialysis who receive nephrology care from a model participant, as well as aligned patients who subsequently receive a transplant. Because more and, on average, larger practices participated in the CKCC model option than in the KCF model option, most patient-months in the KCC Model (94%) were aligned to CKCC in PY 2023, which is a primary driver of overall model results.

Nephrology practices and their nephrologists and nephrology professionals can elect to participate in the KCF or CKCC model option. Under CKCC, nephrology practices team with a transplant provider and optional partners such as dialysis facilities, vascular access surgeons, care management companies, or home care providers to form Kidney Contracting Entities (KCEs), which are accountable for the total cost of care (Medicare Parts A and B) for aligned patients.

Both the KCF and CKCC model options include capitation payments,<sup>5</sup> increased nephrologist payments for managing home dialysis patients so they are on par with payments for managing in-

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<sup>3</sup> We provide additional background, methods, and results in the appendices (**Appendix A: Acronyms**, **Appendix B: Background**, **Appendix C: Primary Data Collection Methodology and Results**, **Appendix D: Participant Characteristics**, **Appendix E: DiD Approach and Results**, **Appendix F: Power Calculation Methodology**, **Appendix G: In-Center Hemodialysis Consumer Assessment of Providers and Systems Analysis Supplement**, **Appendix H: Patient Activation Measure Analysis Supplement**).

<sup>4</sup> Centers for Medicare & Medicaid Services. (2025). *Kidney Care Choices Model Performance Year 2026 model update – quick reference*. <https://www.cms.gov/kidney-care-choices-model-performance-year-2026-model-update-quick-reference>

<sup>5</sup> Capitation payments include the CKD Quarterly Capitation Payment and the Adjusted Monthly Capitation Payment.

center dialysis patients, and bonuses for successful kidney transplants.<sup>6</sup> However, unlike KCF, the CKCC risk-sharing options (Graduated Level 1 [lowest reward] and Graduated Level 2, Professional, and Global [highest risk and reward]) incorporate High Performers Pool payments and varying levels of shared savings and losses.<sup>7</sup> As indicated in **Exhibit 1**, financial incentives in both options depend on quality reporting or performance.

**Exhibit 1. KCC Participants Choose from Several Options and Risk Graduation Paths**

KCC Model Options and Risk Graduation Paths	
KCF Model Option	CKCC Model Option
<ul style="list-style-type: none"> <li>KCF Practices can earn performance-based adjustments depending on quality and utilization measures:                             <ul style="list-style-type: none"> <li>Quality measures: Patient Activation Measure, Depression Response</li> <li>Utilization measures: Optimal ESRD Starts, Cost of Care composite</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>KCEs earn shared savings or losses, based on costs, risk track (increasing from Graduated, to Professional, to Global), and Total Quality Score:                             <ul style="list-style-type: none"> <li>Costs are measured relative to KCE-specific benchmarks</li> <li>Total Quality Score quality measures: Patient Activation Measure, Depression Response, Optimal ESRD Starts</li> </ul> </li> <li>High Performers Pool quality bonuses</li> </ul>

The financial mechanisms, including accountability for the total cost of care under CKCC, incentivize progress toward model goals. Other model features, such as the provider Learning System, as well as patient Benefit Enhancements and Beneficiary Engagement Incentives, encourage provider and patient education and engagement in support of model goals.

The KCC and ETC Models share the primary goals of increasing transplants, expanding home dialysis, and improving care quality. In PY 2023, 40% of KCC aligning providers also provided services in ETC Hospital Referral Regions. Because ETC’s objectives overlap with those of KCC, ETC market status may influence provider decisions to participate in KCC. Further, some KCC and ETC incentives may reinforce each other, particularly for patients who could simultaneously become eligible for both models.<sup>8</sup> For more information on model design, including changes planned for PY 2026, see **Appendix B**.

**1.2. Theory of Action**

The evaluation logic model describes the design features, incentives, and processes through which the KCC Model is predicted to affect behavior and indicates how changes in behavior (drivers of change) could lead to observable changes in outcomes. This structure provides a common

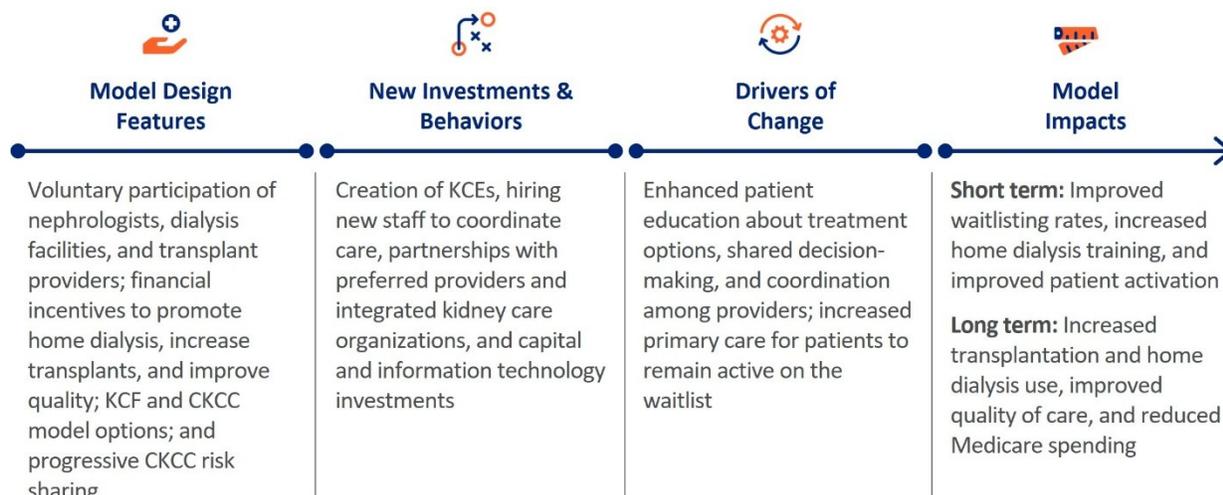
<sup>6</sup> The Kidney Transplant Bonus will be phased out in PY 2026. For other PY 2026 changes, see Centers for Medicare & Medicaid Services. (2025). *Kidney Care Choices Model Performance Year 2026 model update – quick reference*. <https://www.cms.gov/kidney-care-choices-model-performance-year-2026-model-update-quick-reference>

<sup>7</sup> More information can be found on the KCC Model web page: Centers for Medicare & Medicaid Services. (n.d.). *Kidney Care Choices (KCC) Model*. <https://www.cms.gov/priorities/innovation/innovation-models/kidney-care-choices-kcc-model>

<sup>8</sup> The ETC Model ended on December 31, 2025.

framework for identifying and linking program goals, activities, and outcomes. The full logic model is in **Appendix B**, and an abbreviated version is in **Exhibit 2**.

**Exhibit 2. The Evaluation Logic Model Highlights How the KCC Model May Drive Outcomes**



We can consider increased home dialysis as an example of an outcome that KCC is designed to achieve. First, **model design features** include several levers to affect home dialysis utilization. For example, KCC aligns patients with CKD Stage 4 and 5 to the model to better prepare them for dialysis, and the model pays a quarterly capitation rate that provides up-front funding for participants to invest in care coordination. Further, the model offers an expanded Kidney Disease Patient Education Services benefit and rewards participants for performance on planned starts of dialysis, including initiation of home dialysis. These design elements are expected to lead to **new investments and behaviors** among participants, such as partnering with other providers to create KCEs and hiring staff to enhance patient education and preparation for dialysis, including home dialysis. As a result of the new investments and behaviors, enhanced care coordination and shared decision-making serve as **drivers of change** to facilitate **short-term impacts** such as increased patient “activation,” or patients’ ability and confidence to manage their health and health care, and increased home dialysis training. In turn, the KCC Model would then be expected to yield the **longer-term impact** of greater use of home dialysis modalities.

Throughout this report, we describe the potential impacts of the model based on the design elements and drivers of change outlined in the logic model. Understanding the mechanisms intended to achieve the goals of the model, and whether they are successful at driving model impacts, can help inform future models and payment policies.

Existing trends and external factors that may influence observations are also important to understand when interpreting evaluation findings. For example, the movement of patients toward Medicare Advantage is an important consideration for the reach of the model. Since 2021, the 21st Century Cures Act has allowed Medicare patients with ESRD to enroll in Medicare Advantage plans. According to an evaluation analysis, enrollment of patients with ESRD in Medicare Advantage increased from 19% to 51% between 2017 and 2024. If patients with ESRD who decide to join Medicare Advantage differ from those who retain Medicare fee-for-service coverage, the case mix of the evaluation sample could shift, which might affect model impacts. In addition to the

theory of action, we consider the implications of policy changes, environmental factors such as the COVID-19 pandemic, and related models or initiatives in designing the evaluation and contextualizing results.

### 1.3. Research Questions

The logic model and embedded hypotheses guide our analyses of several research questions, addressed in the sections that follow:

- **Section 2: Who Participates in the KCC Model?**

Compared characteristics of participants and nonparticipants to assess balance for the creation of comparison groups and to account for covariates in quantitative modeling. Analysis for PY 2023 includes participants that joined in PY 2022 (Cohort 1) and those that joined in PY 2023 (Cohort 2). We include select cohort-specific results because there could be variation among the timing of joiners and their performance.

- **Section 3: What Were the Impacts of the KCC Model?**

Estimated impacts on utilization, cost, and quality of care metrics in PY 2023, updating and expanding on measures reported in the first evaluation report. Assessed differences in model impacts across patient subgroups for certain measures.

- **Section 4: Did the KCC Model Affect Patient Experience of Care and Quality of Life?**

Evaluated the impact of the model on patient experience of care, activation, and quality of life using results from five surveys.

In addition, throughout the report, we highlight findings from interviews and virtual site visits conducted with model participants that shed light on how participants implemented the KCC Model.<sup>9</sup> Our mixed-methods evaluation approach provides us with a comprehensive understanding of whether the model is making strides toward its goals and the potential drivers of change.

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<sup>9</sup> We conducted key informant interviews with 4 KCF Practices and 16 KCEs and site visits with 5 KCF Practices and 12 KCEs. We used the Zoom videoconferencing platform for all interviews, which each lasted 30–60 minutes. Question topics for site visits and key informant interviews were informed by results from the Participant Implementation Survey fielded in the summer of 2023. See **Appendix C** for more detailed interview and site visit methods.

## 2. Who Participates in the KCC Model?



### Key Findings

KCF Practices and KCEs	Providers	Patients	Markets
<ul style="list-style-type: none"> <li>30 KCF Practices (26 in Cohort 1; 4 in Cohort 2) and 100 KCEs (50 each in Cohorts 1 and 2) participated in the KCC Model in PY 2023.</li> <li>Cohort 2 had fewer KCC-aligned patients on average per practice than Cohort 1 (412 vs. 586).</li> </ul>	<ul style="list-style-type: none"> <li>4,951 nephrology professionals were in the model, with 93% in CKCC.</li> <li>229 transplant providers and 1,594 dialysis facilities joined KCEs.</li> </ul>	<ul style="list-style-type: none"> <li>KCC participants provided care to 51% of eligible Medicare fee-for-service patients.</li> </ul>	<ul style="list-style-type: none"> <li>KCC spanned 44 states and Washington, DC.</li> <li>KCEs were located in markets with more health care facilities and specialists compared with KCF Practices.</li> </ul>

Understanding the types of providers that self-select to participate in the voluntary KCC Model, as well as the patients they serve, is important for designing the evaluation and interpreting model impacts.

In this section, we describe the characteristics of KCF Practices and practices in KCEs, their aligning physicians, and their aligned patients. We also explore differences, including geographic variation, between model participants and nonparticipants. Differences in these characteristics may relate to the decision to participate in the KCC Model, and we consider these differences in selecting a comparison group.

Acronyms	
<b>CBSA</b>	core-based statistical area
<b>CEC</b>	Comprehensive ESRD Care
<b>CKCC</b>	Comprehensive Kidney Care Contracting
<b>CKD</b>	chronic kidney disease
<b>CMS</b>	Centers for Medicare & Medicaid Services
<b>ESRD</b>	end-stage renal disease
<b>ETC</b>	ESRD Treatment Choices
<b>KCC</b>	Kidney Care Choices
<b>KCE</b>	Kidney Contracting Entity
<b>KCF</b>	CMS Kidney Care First
<b>N/A</b>	not applicable
<b>NPI</b>	National Provider Identifier
<b>PY</b>	performance year
<b>Q</b>	quarter

### 2.1. Methods

We constructed a practice-level (Taxpayer Identification Number-level) dataset with information on KCF Practices, practices in KCEs, and nonparticipating practices in Calendar Year 2019, the year that CMS announced the KCC Model and the year before practices could first apply to join the KCC Model (January 2020). Most descriptive statistics regarding KCC participants are based on practice-level data from 2019, when the model was announced and when practices were likely deciding whether to participate in the KCC Model.

We compared KCC-aligned patients with nonparticipants’ patients to understand differences in demographics and kidney disease status at the practice level.<sup>10</sup> We also compared market level characteristics, with KCC markets defined as those CBSAs with at least one KCC Model participant (KCF Practice or practice in a KCE), whereas nonparticipant CBSAs were those with

<sup>10</sup> Appendix D describes the simulated alignment based on the KCC Model eligibility criteria.

nephrology practices but no KCC Model participants.<sup>11</sup> We aggregated county-level characteristics to the Office of Management and Budget core-based statistical area (CBSA) market level by weighting individual county observations by aligned patient-months.

## 2.2. Results and Discussion

The KCC Model consists of a first cohort of participants that started in PY 2022 (“Cohort 1”) and a second and final cohort that joined in PY 2023 (“Cohort 2”). Below we describe practice, patient, and market characteristics across Cohort 1 and Cohort 2 KCF Practices and KCEs in the pre-KCC period. In addition to the growth in participants, more patients were aligned to participants, including more patients with CKD, as the result of KCC Model changes that took effect in PY 2023.<sup>12</sup>

### 2.2.1. Characteristics of KCC Participants

In PY 2023, 100 KCEs and 30 KCF Practices participated in the model. The KCEs were evenly split between the two cohorts (50 in Cohort 1 and 50 in Cohort 2), while 26 KCF Practices joined in Cohort 1 and another 4 joined in Cohort 2. Prior to PY 2023, five Cohort 1 KCEs and four Cohort 1 KCF Practices left their respective model options, with one KCF Practice leaving to join a KCE (see **Exhibit 3**).

A KCE’s level of risk is based on its selection of risk-sharing options: Graduated (upside only to start, transitioning to two-sided risk), Professional (50% shared savings or losses), or Global (100% risk) (see **Appendix B**). Among the 100 KCEs, most participated in the Professional option (51), followed by the Global option (31), the Graduated Level 2 option (14), and the Graduated Level 1 option (4).

**Exhibit 3. KCC Model Participation Grew in PY 2023 with the Addition of Cohort 2**

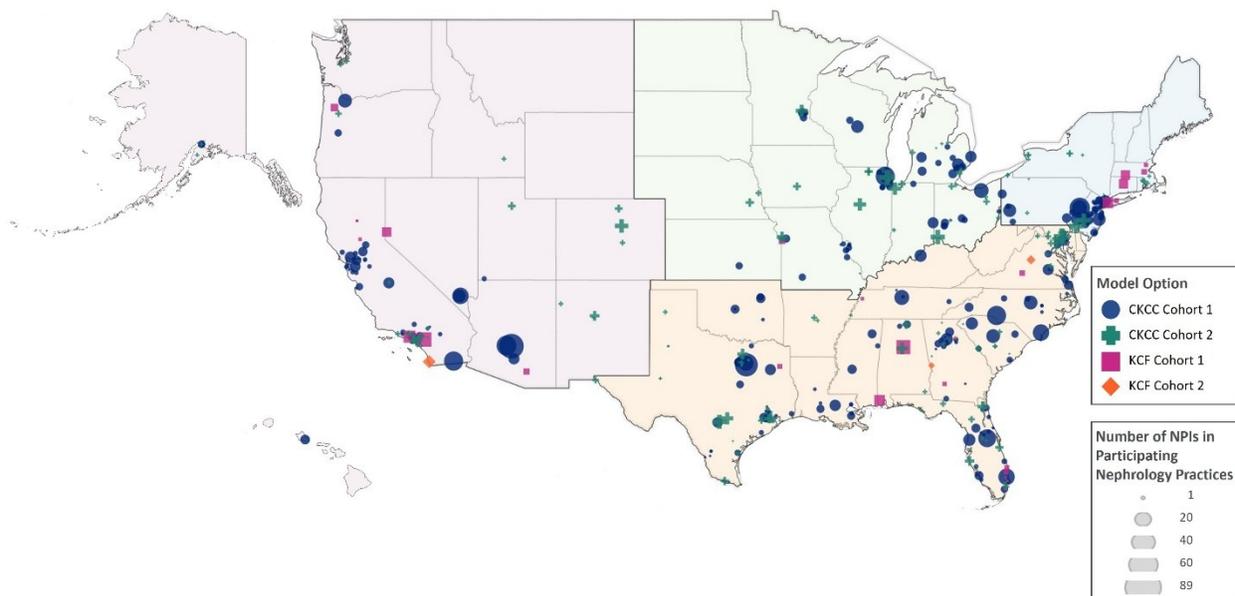


<sup>11</sup> Practices or entities can be in multiple CBSAs. When a practice or entity provides services in more than one CBSA, its market characteristics are a weighted average of the characteristics for the CBSAs in which it is providing services.

<sup>12</sup> In PY 2023, CMS modified the model service area and majority of care definitions to align the model with treatment patterns of the patient populations, generally leading to more patients aligned to the KCC Model.

The 550 nephrology practices participating in PY 2022 or PY 2023 provided services in 44 states and Washington, DC, with increased participation in the Midwest and West with the addition of Cohort 2 (see **Exhibit 4**).

**Exhibit 4. Practices Participating in KCC in PY 2022 or PY 2023 Provided Services in 44 States and Washington, DC**



**Note:** The map is divided into the following four U.S. census regions: Northeast (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, New York, Pennsylvania, and New Jersey); Midwest (Indiana, Illinois, Michigan, Ohio, Wisconsin, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota); South (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, and Texas); and West (Arizona, Colorado, Idaho, New Mexico, Montana, Utah, Nevada, Wyoming, Alaska, California, Hawaii, Oregon, and Washington). NPI = National Provider Identifier; Q = quarter.

**Source:** Data on KCF Practices and practices in KCEs were based on the first quarter of PY 2022 or PY 2023 participation list of aligning providers. We used physician ZIP from CKD and ESRD claims submitted by aligning providers to identify a practice’s primary ZIP Code (practices often have more than one location). Size of practice is based on the number of NPIs in 2019.

### 2.2.1.1. Characteristics of Participating Nephrology Practices

There are some notable differences between KCF Practices and practices within KCEs in terms of geographic representation, size (as measured by number of aligned patients), and ESRD Treatment Choices (ETC) or Comprehensive ESRD Care (CEC) Model overlap.

Geographic distribution of practices participating in KCF and CKCC varied by census region (see **Exhibit 4** and **Appendix D**). The region with the most participation in continued to be the South for both KCF and CKCC (with 50% and 45% of participating practices, respectively). The Midwest had the lowest relative participation for KCF (3%) and second lowest for CKCC (19%). Model participation in the Northeast was similar between KCF and CKCC (18% and 15%, respectively), with a notable concentration of participants in the Graduated Level 1 CKCC risk-sharing option (50% of practices). Similarly, while fewer practices in the Midwest and Northeast chose the CKCC Global option (5% and 10%, respectively), the West had a relatively high representation at 41% of practices in this option. Nonparticipants tended to be more geographically dispersed, with 39% of practices located in the South, 24% in the Northeast, 20% in the West, and 19% in the Midwest.

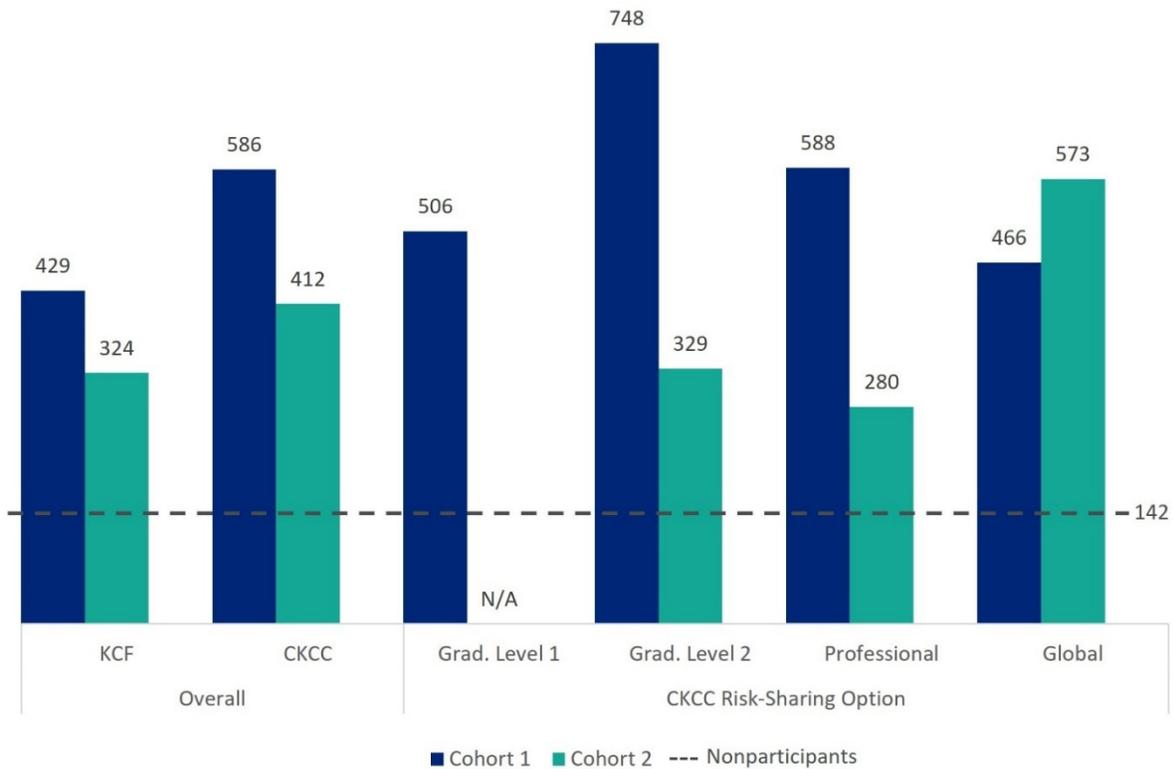
Practice size, as measured by the number of aligned patients, varied by model option and cohort (see **Exhibit 5**). The average number of aligned patients in participating practices was much higher than the number of patients who met the model alignment criteria in nonparticipating practices. CKCC practices had more aligned patients on average than KCF, and CKCC Cohort 2 practices generally aligned fewer patients than Cohort 1.

Large practices with existing partnerships and more risk tolerance may be more likely to form a KCE, thus selecting the CKCC option. Smaller practices that cannot absorb risk and do not have extensive networks of potential partners may be more likely to choose the KCF option. Three of the four KCF Practices participating in interviews were motivated to join the CKCC model option based on their goals and philosophy for patient care, but they were too small to meet the alignment targets required to form a KCE. In addition, the KCF Practices expressed more aversion to bearing downside risk.

*“We felt that this the CKCC model, is the most comprehensive, this is, going to be likely the future of nephrology in the next 10 years or so. Then that’s what we’re going to get into [it].”*  
 – KCE Physician

During site visits, multiple participants stated they had a prior belief in and past success with home dialysis and transplantation, creating strong alignment between their goals and what the model rewards.

**Exhibit 5. Mean Number of Aligned Patients per Practice Varied by Model Option, Cohort, and CKCC Risk-Sharing Option**



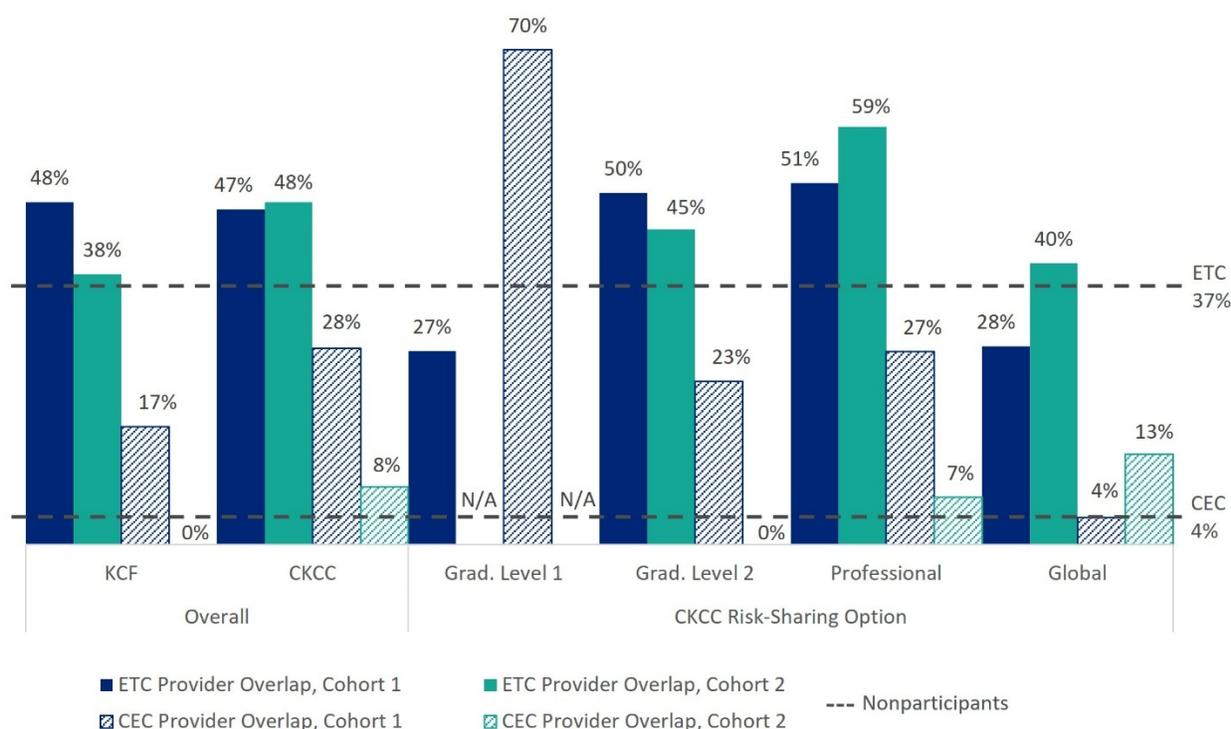
**Note:** N/A = not applicable; Q = quarter.

**Source:** Data on practices in KCEs and KCF Practices were based on the Q2 PY 2022 and PY 2023 participation lists of aligning providers as of 2019.

CEC Model overlap, measured as the percentage of KCC aligning providers that participated at any point in CEC, varied substantially by model option and cohort (see **Exhibit 6**), with 28%, the largest share, in CKCC Cohort 1. Providers that had previously participated in the CEC Model reported in the Participant Implementation Survey that CKCC provided the opportunity to extend the comprehensive care approach upstream to patients with CKD.<sup>13</sup>

ETC Model overlap, measured as the percentage of KCC aligning providers in an ETC Hospital Referral Region, had less variation by cohort. Nearly half of participating providers were in an ETC Hospital Referral Region, with the exception of KCF Cohort 2 providers, of which only 38% (similar to 37% nonparticipants) overlapped with ETC.

**Exhibit 6. ETC and CEC Provider Overlap Varied by Model Option, Cohort, and CKCC Risk-Sharing Option**



**Note:** N/A indicates that the risk track had no Cohort 2 providers. ETC = ESRD Treatment Choices; CEC = Comprehensive ESRD Care; N/A = not applicable; Q = quarter.

**Source:** Data on practices in KCEs and KCF Practices were based on the Q2 PY 2022 and PY 2023 participation lists of aligning providers as of 2019.

### 2.2.1.2. KCE Partnerships

Most providers (93%) who joined the model participated in CKCC. Within CKCC, KCEs included partnerships with 229 transplant providers, with the average transplant provider partnered with approximately 2 KCEs. In addition, 40 KCEs included optional partnerships with dialysis facilities (1,594 dialysis facilities total) for an average of 40 dialysis facility partners per KCE.

<sup>13</sup> The Lewin Group. Kidney Care Choices (KCC) Model first annual evaluation report, Performance Year 2022. Prepared for the Centers for Medicare & Medicaid Services. <https://www.cms.gov/kcc-model-eval-ann-rpt-1>

KCEs have also partnered with integrated kidney care organizations (also known as care coordination organizations) to improve their internal Patient Activation Measure (PAM) and PHQ-9 (depression severity assessment) collection and response processes, provide patient education, manage care coordination, and analyze practice data to assess opportunities to improve performance across clinical metrics used in value-based care. One key finding from the site visits conducted with model participants was the high prevalence of partnerships with these organizations, which either were the primary entity that worked with nephrology practices to establish a KCE or were selected by nephrology practices due to the additional clinical and financial resources (for example, to hire additional staff) they provide. Of the 100 KCEs, 62 were partnered with an integrated kidney care organization.

*“We were initially going to start CKCC in 2022, but we decided the selection of a strategic partner is so important that we would hold off 1 year and interview [integrated kidney care organization 1], the [large dialysis organization], and [integrated kidney care organization 2] and decide what a strategic partner was ... then we chose to have [integrated kidney care organization 2].”*

*– KCE Physician*

### **2.2.2. Characteristics of Patients Aligned to Participating Practices**

Medicare patients with CKD Stage 4 or 5, or ESRD and who received the majority of their kidney care from a participating KCE or KCF Practice are aligned to the corresponding model option. In addition, aligned patients with CKD or ESRD who receive a transplant remain aligned to the model for 3 years after receiving a transplant. We examined the medical, demographic, and other characteristics of patients aligned to KCF Practices and practices in KCEs. In PY 2023, KCC Model participants provided care to 51% of eligible Medicare fee-for-service patients with advanced kidney disease. Patients aligned to KCC participants in various model options across cohorts were generally similar in terms of:

- Patient demographic characteristics, such as age and sex
- Patient disease status (the proportion of patients with CKD Stage 4 or 5, patients with ESRD, and patients who have received a transplant)
- Type of hemodialysis vascular access among patients with ESRD

We present these results in **Appendix D**.

### **2.2.3. Characteristics of Markets in Which KCC Providers Operated**

Our assessment of market (CBSA-level) characteristics included provider type and specialty as well as patient population demographic characteristics for markets with KCF Practices, practices in KCEs, and nonparticipants (see **Appendix D**). The markets in which KCF Practices and practices in KCEs operated were similar in terms of:

- Percentage of patients with dual eligibility for Medicare and Medicaid
- Medicare Advantage penetration
- Median age and income of patients

However, there were noticeable differences among other market characteristics that appear to be driven by population density. Cohort 1 KCEs were located in markets with more dialysis facilities, short-term acute care hospitals, transplant hospitals, transplant surgeons, nephrology practices, and Medicare providers than Cohort 2 KCEs, KCF Practices, or nonparticipants (see **Appendix D**). KCF Practices are located in less densely populated markets than practices in KCEs or nonparticipants.

### 3. What Were the Impacts of the KCC Model?



#### Key Findings

Dialysis Care	Spending	Quality of Care	Transplantation
<p>Financial incentives to expand home dialysis and improve patient modality education could increase home dialysis use among patients under the model. In PY 2023, the KCC Model <b>increased home dialysis use by 10%</b>, driven by growth in peritoneal dialysis.</p>	<p>The KCC Model’s pathways for improving care management could lower total payments as well as net Medicare spending. Overall, the model <b>increased net Medicare spending by \$304.8 million</b>, driven by incentive payments from CMS to participants.</p>	<p>Enhanced patient education and care coordination under the model could improve management of CKD and transitions into ESRD. KCC <b>led to a 31% increase in new patients with ESRD receiving a planned start of renal replacement therapy (Optimal ESRD Start).</b></p>	<p>The model includes quality and payment mechanisms that could improve transplant waitlisting and transplantation rates for KCC patients. <b>Living donor transplant rates increased by 22%</b> under the KCC Model.</p>
Favorable                  Neutral			

A core component of the KCC Model evaluation is assessing changes in health care use, cost, and quality to determine whether the model is achieving its intended impacts or possibly leading to unintended consequences. We used Medicare claims and other data sources to understand shifts that may be occurring due to the model’s incentives, comparing measures from the pre-KCC period and the KCC intervention period for model participants relative to a matched comparison group.

In this section, we present findings on the KCC Model’s impacts in its second performance year, PY 2023. We analyzed measures related to dialysis modality, transplantation, quality of care, utilization, and Medicare payments and present select findings for outcomes of interest; full results for all measures are in **Appendix E**.

Acronyms	
CEC	Comprehensive ESRD Care
CI	confidence interval
CKCC	Comprehensive Kidney Care Contracting
CKD	chronic kidney disease
CMS	Centers for Medicare & Medicaid Services
DiD	difference-in-differences
ED	emergency department
eGFR	estimated glomerular filtration rate
ESRD	end-stage renal disease
ETC	ESRD Treatment Choices
KCC	Kidney Care Choices
KCE	Kidney Contracting Entity
KCF	CMS Kidney Care First
M	million
PD	peritoneal dialysis
PP	percentage points
PPPM	per patient per month
PY	performance year
QCP	quarterly capitated payment

#### 3.1. Methods

In our mixed-methods evaluation, we examined a variety of outcomes that participation in the KCC Model could influence for patients with CKD Stage 4 or 5, patients with ESRD, and transplant recipients. The selection of outcomes was driven by the model’s logic model (**Appendix B**), developed to describe potential pathways of effects. Themes developed in 2 days of discussion with the Patient Advisory Group in PY 2022 further informed the selection of outcomes and interpretation of results.

For this report, we analyzed more than 50 measures of utilization, Medicare costs, and quality of care (see full list of measures in **Appendix E**). For most measures, we used a difference-in-differences (DiD) approach to estimate impacts of the KCC Model relative to the comparison group.

For the DiD analyses, we used Medicare Parts A and B enrollment and claims data from January 2017 to December 2023, in combination with other program, provider, and market data sources.<sup>14,15</sup> We describe the DiD methodology—including data sources, outcome definitions, comparison population identification and exclusion criteria, and statistical models—and other analytic methods (for example, Cox proportional hazards) in **Appendix E**.

The final sample for PY 2023 consisted of 190,287 KCC patients (178,611 in CKCC and 11,676 in KCF) and 49,129 comparison patients (43,106 comparison CKCC patients, 2,781 comparison KCF patients, and 3,242 patients who were matched to both CKCC and KCF). Across KCC participants and the comparison group, patients were similar in terms of demographic and clinical characteristics (see **Appendix D**). We discuss considerations of statistical power to detect impacts in **Appendix F**.<sup>16</sup>

## 3.2. Results and Discussion

### 3.2.1. Impacts of the KCC Model on Utilization and Cost

We evaluated the KCC Model's impact on patients' utilization of different dialysis modalities, other health care utilization, and health care costs to gain insights into how the model encourages changes to care and care coordination across practices and providers. Across our results, the CKCC model option accounts for the vast majority of patient-months and therefore drives most aggregated model-level results, unless otherwise noted.

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<sup>14</sup> Transplant measures are based on waitlisting and transplant data from 2017–2023 files. See **Appendix E** for a description of the Scientific Registry of Transplant Recipients (SRTR) Data.

<sup>15</sup> The data reported here have been supplied by the Hennepin Healthcare Research Institute (HHRI) as the contractor for the Scientific Registry of Transplant Recipients (SRTR). The interpretation and reporting of these data are the responsibility of the author(s) and in no way should be seen as an official policy of or interpretation by the SRTR or the U.S. Government. This study used data from the Scientific Registry of Transplant Recipients (SRTR). The SRTR data system includes data on all donor, wait-listed candidates, and transplant recipients in the US, submitted by the members of the Organ Procurement and Transplantation Network (OPTN). The Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services provides oversight to the activities of the OPTN and SRTR contractors. This evaluation was submitted to a functioning institutional review board (IRB) and determined IRB exempt.

<sup>16</sup> The number of participants and patients provides reasonable confidence that the analysis would detect modest impacts on Medicare service use and costs for all patients. Due to the difference in the number of participants, the analysis could detect more modest impacts for CKCC than for KCF. For Total Medicare Parts A & B payments, the analyses are powered at 0.80 to detect a 13% difference for KCF and a 4% relative difference for CKCC.

### 3.2.1.1. Dialysis Utilization and Modality

#### Dialysis Modality

**Potential Impacts** | The KCC Model could increase the use of home dialysis and home dialysis training and decrease the use of in-center dialysis through financial incentives such as the Home Dialysis True-Up and expanded opportunities for patient education under the Kidney Disease Patient Education Services Benefit Enhancement.

**Findings** | For patients with ESRD, KCC led to **increased home dialysis use and home dialysis training** as well as **decreased in-center dialysis use**, which could indicate that KCC providers are improving patient education on dialysis modality.

Home dialysis can offer patients more flexibility and independence in managing their care because it requires less frequent visits to a dialysis provider than in-center dialysis. Most patients with ESRD receive in-center dialysis, but use of home dialysis has grown steadily in the United States over the past decade (from about 9% to 15% between 2012 and 2022).<sup>17</sup>

Several aspects of the KCC Model’s design are intended to increase the use of home dialysis and reduce the historical reliance on in-center dialysis care:

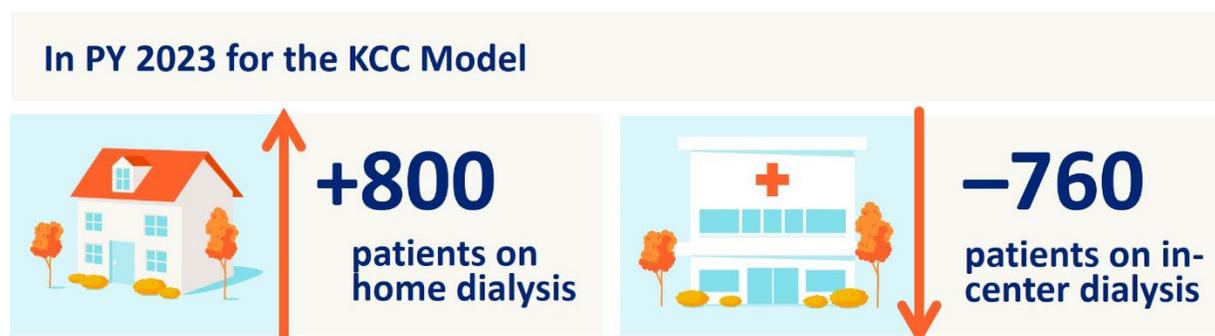
- The Home Dialysis True-Up increases nephrologist payments for managing home dialysis patients on par with those for managing in-center dialysis patients.
- The CKD Quarterly Capitated Payment (QCP) provides up-front funding to spur provider investments in care coordination and earlier and enhanced patient education about treatment modalities.
- The Kidney Disease Patient Education Services Benefit Enhancement provides financial incentives to allow more types of providers (dietitians, registered nurses, licensed clinical social workers) to deliver—and an expanded pool of patients (CKD Stage 5 and first 6 months of ESRD) to receive—kidney disease education services.

In addition, under the KCC Model’s voluntary design, the providers that opt to participate may be more motivated to change their approach to care delivery. We present the model’s impact on home and in-center dialysis utilization in **Exhibit 7** and **Appendix E**.<sup>18</sup>

<sup>17</sup> U.S. Renal Data System. (2024). *USRDS annual data report: Epidemiology of kidney disease in the United States*. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. <https://usrds-adr.niddk.nih.gov/2024>

<sup>18</sup> Our analysis of dialysis modalities covered a comprehensive set of modality types, including in-center hemodialysis, home dialysis, home hemodialysis, PD, and nursing facility dialysis. We present the results for the less frequently used modalities, home hemodialysis and nursing facility dialysis, in **Appendix E**.

- In aggregate, the **KCC Model** increased *home dialysis* utilization by 1.1 percentage points (pp) ( $p < 0.10$ ) relative to the comparison group, or 10% of the pre-KCC mean, and decreased in-center dialysis use by 1.0 pp ( $p < 0.10$ ) relative to the comparison group, or 1% of the pre-KCC mean.<sup>19</sup>
  - The **CKCC** model option increased the proportion of patients receiving *home dialysis* in a given month by 1.1 pp ( $p < 0.10$ ) relative to the comparison group, or 11% of the pre-KCC mean, driven by Cohort 2.
  - The **CKCC** model option decreased the proportion of patients with ESRD using *in-center dialysis* in a given month by 1.1 pp ( $p < 0.10$ ) relative to the comparison group, or 1% of the pre-KCC mean, driven by Cohort 2.



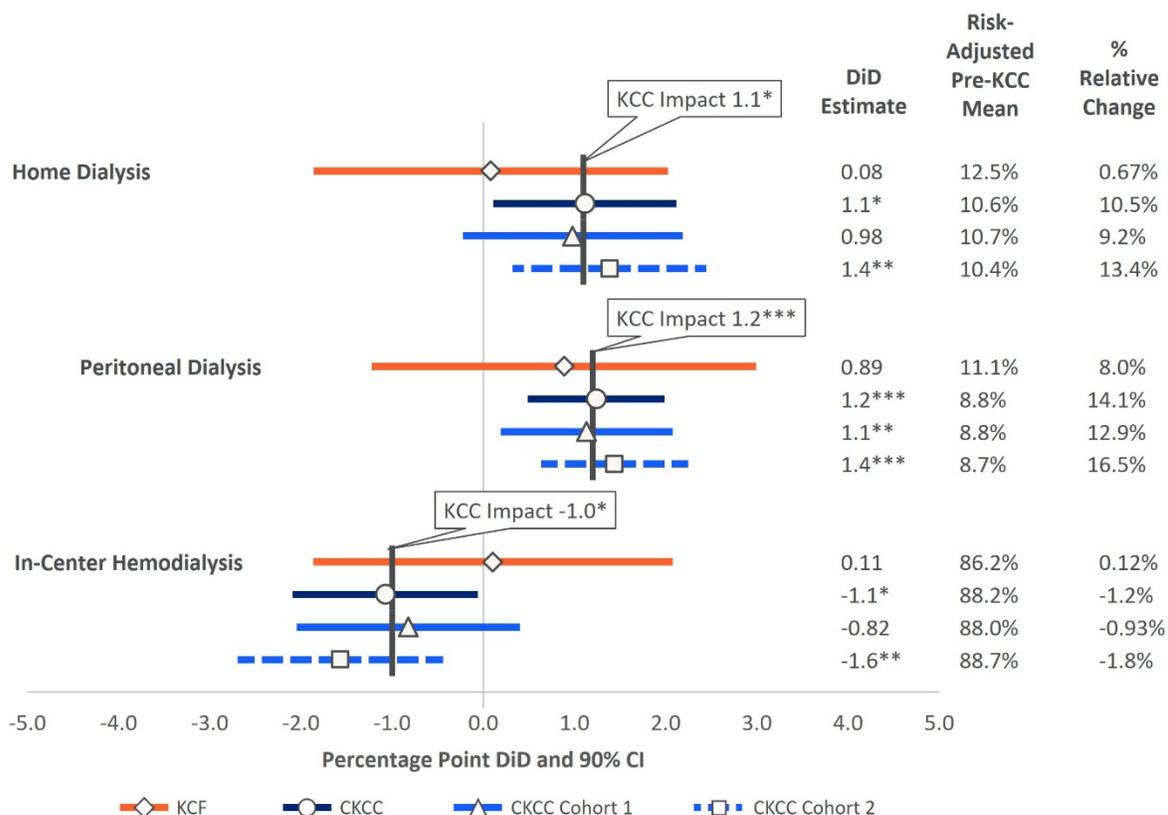
We expect the KCC Model to affect home dialysis primarily through peritoneal dialysis (PD), the dominant home dialysis modality. Consistent with the overall home dialysis findings, we found that use of PD grew for the KCC Model by 1.2 pp ( $p < 0.01$ ) relative to the comparison group, or 14% of the pre-KCC mean.

Despite the reduction in in-center dialysis use, dialysis adherence showed signs of improvement, which could signal higher-quality care under the model. Outpatient dialysis sessions are routine, nonemergency dialysis sessions for patients with ESRD that take place in a dialysis center. Under the model incentives, providers may hire additional staff to help coordinate care and reschedule missed sessions so that patients do not dialyze in the emergency department (ED) and increase the patient's total cost of care, while being at elevated risk for missing regularly scheduled treatments. The **CKCC** model option led to an increase of 0.04 outpatient dialysis sessions per month ( $p < 0.10$ ) relative to the comparison group, or 0.3% of the pre-KCC mean (see **Appendix E**). This relatively small effect is likely attributed to the high levels of adherence to dialysis for patients during the baseline period.

<sup>19</sup> Aggregate KCC Model estimates were calculated as a postestimation weighted average of the individual KCF and CKCC option impact estimates. See **Appendix E** for more details.

To calculate the number of patients affected by the KCC Model, we multiplied the impact estimate by the number of KCC-aligned observations in PY 2023 for a given outcome. If the outcome occurs once (example: Optimal ESRD Starts), this is our desired value. If the outcome can be recurring (example: home dialysis), this value is divided by 9.2 (the average number of months a KCC-aligned patient appears in the dataset in PY 2023) to arrive at the desired value. For transplant outcomes, we divided the product by 1,000 (because the DiD estimate is per 1,000 patient-months).

**Exhibit 7. The KCC Model Increased Home Dialysis Utilization and Decreased In-Center Dialysis Utilization**



**Note:** Denominator is restricted to patients with ESRD. Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. DiD impact estimates come from a linear DiD regression model. Bars represent the 90% CI. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. Home dialysis includes PD and home hemodialysis modalities. CI = confidence interval; DiD = difference-in-differences.

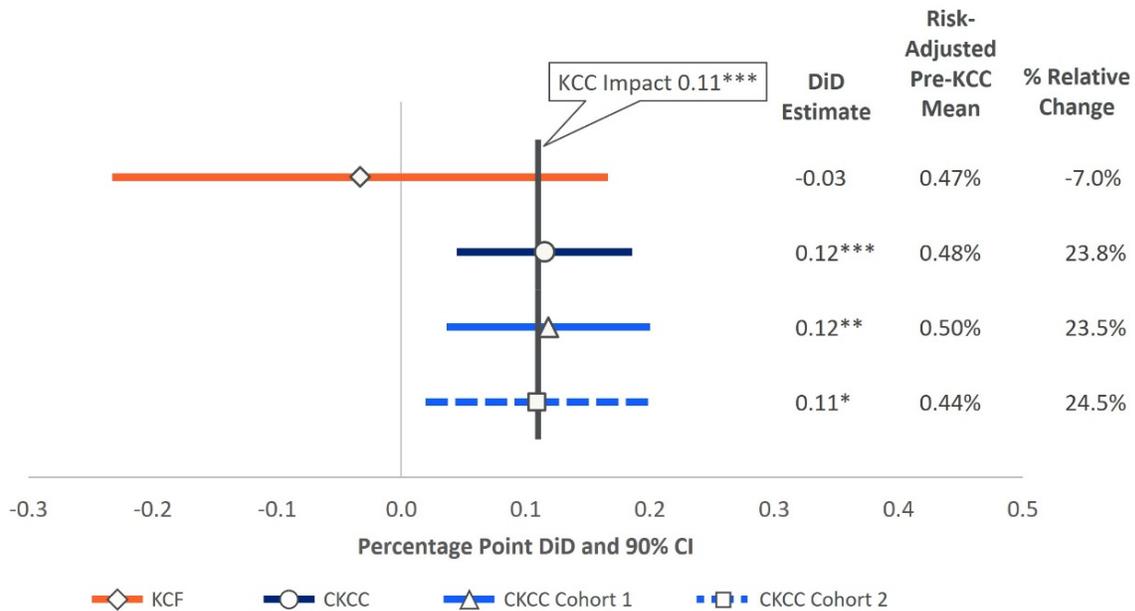
A key step for patients with ESRD to be able to dialyze at home is the receipt of home dialysis training. We expect the KCC Model to increase the receipt of home dialysis training by encouraging providers to invest in patient education about treatment modalities and expanding the Kidney Disease Patient Education Services Benefit Enhancement to more patients and providers. We present the model’s impact on home dialysis training in **Exhibit 8** and **Appendix E**.

- In aggregate, the **KCC Model** increased the proportion of patients who received home dialysis training by 0.11 pp (p<0.01) relative to the comparison group, or 22% of the pre-KCC mean.
  - **CKCC** increased the proportion of patients who received home dialysis training in a given month by 0.12 pp (p<0.01) relative to the comparison group, or 24% of the pre-KCC mean.

On average, less than 1% of patients with ESRD received home dialysis training in a given month. Patients can complete home PD training in a matter of days when they begin this modality, so average monthly rates and estimated changes may appear small. However, they are a meaningful

signal that CKCC providers are increasing the share of patients in a given month who are training for home dialysis.

**Exhibit 8. The KCC Model Increased Home Dialysis Training**



**Note:** Denominator is restricted to patients with ESRD. Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Bars represent the 90% CI. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. CI = confidence interval; DiD = difference-in-differences.

Improved patient education—both home dialysis training, specifically, and broader education on the different modality options—can help empower patients to be more active in their care. During site visits, clinic staff and physicians reported a range of approaches to dialysis and kidney replacement modality education. Among KCF Practices, clinic staff or care coordinators used a combination of in-person classes and follow-up appointments to provide dialysis and transplant education. Among KCEs, several relied on their integrated kidney care organization partner to do follow-up modality education after a patient’s initial education sessions. Some KCEs used the existing modality education program provided by their large dialysis organization partner. One KCE reported using an RV as an education tool to showcase greater independence to travel afforded by home dialysis modalities. As patients become more engaged in their care management and feel empowered to make decisions on their treatment options, they may select home dialysis given the autonomy it allows.

*“We have our physician assistant—she was hired just especially to educate patients on home modalities because we’re trying to promote that part.”*

– KCF Clinic Staff

Our finding that home dialysis use increased under the KCC Model is consistent with model participants’ reports of investing in and providing enhanced modality education, and as we

describe in [Section 4](#), a higher percentage of patients with CKD in the KCC Model reported receiving information about PD relative to those in the survey comparison group.

### 3.2.1.2. Acute Care Use

#### Acute Care Use

**Potential Impacts** | The KCC Model could reduce acute care hospitalizations, hospital readmissions, and ED visits through the CKD QCP and the potential for shared savings or losses under CKCC. These financial incentives may improve care coordination.

**Findings** | Overall, the KCC Model **did not affect acute care hospitalizations, hospital readmissions, or ED visits.**

Hospitalizations, readmissions, and ED visits are common among patients with kidney disease. Frequent reasons for hospitalization of patients with CKD and ESRD include cardiovascular events and infection.<sup>20</sup> Avoiding preventable use of costly acute care services through better care management could help lower Medicare expenditures and improve quality of life for patients with kidney disease. In the Comprehensive ESRD Care (CEC) Model, the predecessor to the KCC and ESRD Treatment Choices (ETC) Models, decreases in hospitalizations and readmissions among patients with ESRD were a primary driver of payment reductions.<sup>21</sup> CEC exclusively focused on patients with ESRD. Expanding the patient population of interest to an earlier stage of kidney disease allows KCC participants to engage with patients earlier and implement changes such as improved care coordination and preventive services to potentially slow disease progression and start kidney replacement therapy in a planned way, which can reduce the risk of infections, reduce hospitalizations, and lower costs in the long run.

In aggregate, the KCC Model did not affect acute care hospitalizations, hospital readmissions, or ED visits (see [Appendix E](#)). The KCC Model's financial incentives tied to quality of care and utilization, as well as the potential for shared savings under the CKCC model option, are designed to motivate providers to invest in new staff or other resources to delay disease progression, improve care coordination, and prevent hospitalizations. Ultimately, however, it may be too early in the model to observe effects on acute care use. Changing the culture and

*"We have placed patients with a renal care coordinator ... And I think it's clear from the metrics and the cost management the impact that [she] had when she came into the office with us formally in this role and coordinating the transitions of care, which was a big hole for us."*

– KCE Physician

<sup>20</sup> United States Renal Data System. (2024). *2024 USRDS annual data report: Epidemiology of kidney disease in the United States*. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. <https://usrds-adr.niddk.nih.gov/2024/>

<sup>21</sup> The Lewin Group. (2022). *Comprehensive End-Stage Renal Disease Care (CEC) Model fifth annual report*. Prepared for Centers for Medicare & Medicaid Services. <https://www.cms.gov/priorities/innovation/data-and-reports/2022/cec-annrpt-py5>

processes of a practice in a way that improves outcomes can take time. Some participants reported in interviews that it is hard to make progress on hospitalization outcomes in the short run.

Reducing hospitalizations and ED visits for patients with kidney disease may also be challenging because they are a complex population, often managing many comorbidities. Participants reported holding interdisciplinary team meetings to discuss patients with high risk of hospitalization and conducting medication reconciliation after a hospitalization to prevent readmission.

*“We’ve seen the amazing changes that can happen with ... [medication reconciliation] alone, just going through and having the pharmacists call them separately and go through the new medication changes, updating me with that so I can take a faster stance on antibiotics [if they] might not be dosed correctly, or things like that.”*

– KCE Physician

### 3.2.1.3. Health Care Costs

#### Total Payments

**Potential Impacts** | The KCC Model could reduce total Medicare payments by decreasing avoidable hospitalizations or ED visits through improved care management spurred by financial incentives such as the CKD QCP and the potential for shared savings or losses under CKCC.

**Findings** | Overall, the KCC Model **did not affect Total Medicare Parts A & B payments.**

Patients with kidney disease account for a disproportionate share of fee-for-service Medicare spending. For example, the 15% of fee-for-service Medicare patients with CKD accounted for 27% of Medicare spending in 2022.<sup>22</sup>

We analyzed several measures of costs in key areas where we would potentially see changes given the KCC Model’s financial incentives to increase home dialysis, increase transplants, and improve quality. These care changes implemented by providers may reduce payments for hospitalizations, readmissions, and ED visits, while we may see an increase in office visits and preventive care payments.

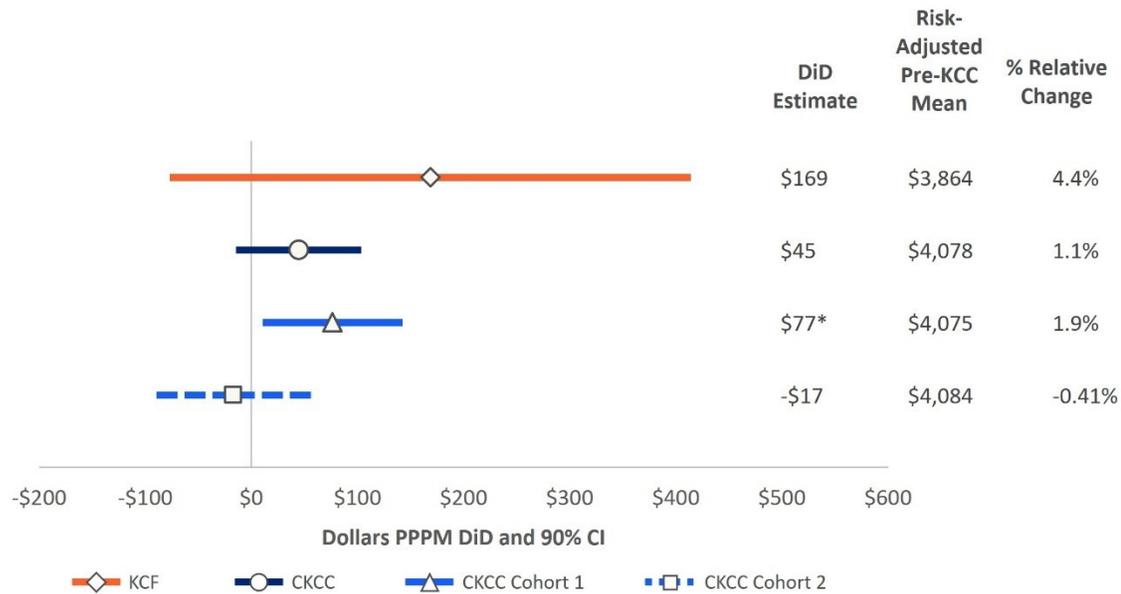
To understand whether KCC had an impact on Medicare payments in PY 2023, we examined Medicare Parts A & B standardized payments, excluding payments for CKD QCP services rendered by nephrology professionals (which include services related to evaluation and care management).<sup>23</sup> Overall, the KCC Model did not have an impact on Total Medicare Parts A & B

<sup>22</sup> United States Renal Data System. (2024). *2024 USRDS annual data report: Epidemiology of kidney disease in the United States*. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. <https://usrds-adr.niddk.nih.gov/2024/>

<sup>23</sup> The KCC Model replaces typical fee-for-service payments with a capitated payment for services included on the CKD QCP list provided by nephrology professionals, so participants experience a price change that is not reflected in the comparison group, which would theoretically pose a potential bias to our impact estimates if included in the outcome measure. As a sensitivity analysis, we also examined the effects of the KCF and CKCC options on Total

payments. For CKCC Cohort 1, however, Medicare payments increased by \$77 per patient per month (PPPM) ( $p < 0.10$ ), or 2% of the pre-KCC mean, relative to the comparison group (see **Exhibit 9**). The increase in total Medicare payments for Cohort 1 is driven by nearly statistically significant increases in Part B payments, including an increase in total dialysis payments for patients with ESRD (see **Appendix E**). Cohort 1 participants are early adopters of the KCC Model, and many bring value-based care experience from CEC. They have also had the most time in the model to put primary care management initiatives in place in order to promote attending dialysis sessions regularly and prepare for preemptive transplants.

**Exhibit 9. Total Medicare Parts A & B Payments Did Not Change for the KCC Model Overall but Increased for Patients Aligned to CKCC Cohort 1**



**Note:** Denominator consists of patients with CKD Stage 4 or 5, patients with ESRD, and transplant recipients. Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Bars represent the 90% CI. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. The outcome measure Total Medicare Parts A & B payments does not include payments for services by nephrologists on the CKD QCP list. CI = confidence interval; DiD = difference-in-differences; PPPM = per patient per month.

To better understand Total Medicare Parts A & B payments, we defined separate payment categories for Medicare Parts A & B services, including hospitalizations, readmissions, institutional post-acute care services, home health services, outpatient services, office visits, and dialysis care. Estimating payments for these components can help explain, for example, why Total Medicare Parts A & B payments for patients aligned to CKCC Cohort 1 were significantly higher than payments for patients aligned to the comparison group.

Medicare Parts A & B payments, including payments for CKD QCP services from nephrology professionals. For both the KCF and CKCC options, estimated impacts were similar in magnitude and statistical significance when payments for CKD QCP services were included compared with when these payments were excluded. These results are provided in **Appendix E**.

## Part A Payments

**Potential Impacts** | Improvements in care coordination encouraged by the CKD QCP, along with the potential for shared savings or losses under CKCC, could reduce acute care use and corresponding Part A payments among KCC participants.

**Findings** | Overall, the KCC Model **did not affect total Part A payments**, consistent with the lack of change in acute care utilization.

Among Part A subcomponents, payments for hospitalizations and readmissions comprise the largest percentage of Part A spending. Avoiding preventable, costly hospitalizations through better care coordination could help lower Medicare expenditures and improve patient quality of life. As noted previously, decreases in hospitalizations and readmissions among patients with ESRD were a primary driver of payment reductions in the CEC Model.<sup>24</sup>

Overall, the KCC Model did not have a statistically significant impact on total Medicare Part A payments. The lack of statistically significant findings for both model options on Part A payments aligns with the utilization results, where neither model option had a significant effect on hospitalizations, readmissions, or ED use.

## Part B Payments

**Potential Impacts** | Financial incentives such as the CKD QCP could prompt KCC participants to increase preventive care services, outpatient office visits, and home dialysis utilization, potentially leading to increases in Part B payments.

**Findings** | Overall, the KCC Model **increased total Part B payments**, corresponding to impacts on dialysis modality.

Medicare Part B covers services such as outpatient care, preventive care, and necessary medical equipment and supplies. If the KCC Model improves provider oversight and patient adherence to preventive or routine care, we may expect to see increases in Part B payments.

The KCC Model increased total Part B payments by \$39 PPPM ( $p < 0.10$ ) relative to the comparison group, or 2% of the pre-KCC mean, but we did not detect statistically significant impacts at the model option level (see **Appendix E**). To understand whether the model is leading to shifts in payments for certain Part B subcomponents that are driving this increase, we analyzed payments along two domains: (1) hospital outpatient and evaluation and management payments for all patients in the analytic samples and (2) dialysis-related payments for patients with ESRD. Overall, the KCC Model did not have a statistically significant impact on hospital outpatient payments but led to an increase in evaluation and management payments of \$2 PPPM ( $p < 0.01$ ) relative to the comparison group, or 2.1% of the pre-KCC mean (see **Appendix E**). Providers may

<sup>24</sup> The Lewin Group. (2022). *Comprehensive End-Stage Renal Disease Care (CEC) Model fifth annual evaluation report*. Prepared for the Centers for Medicare & Medicaid Services. <https://www.cms.gov/priorities/innovation/data-and-reports/2022/cec-annrpt-py5>

be increasing evaluation and management visits to improve their oversight of patient care and avoid higher-cost complications in the future. Changes in dialysis payments for patients with ESRD corresponded with observed shifts in dialysis modality use, as described below.

## Part B Dialysis Costs

**Potential Impacts** | The KCC Model could increase the use of home dialysis through the Home Dialysis True-Up financial incentive, and as a result, home dialysis payments would increase. Total dialysis payments could increase if the model results in greater adherence to in-center dialysis.

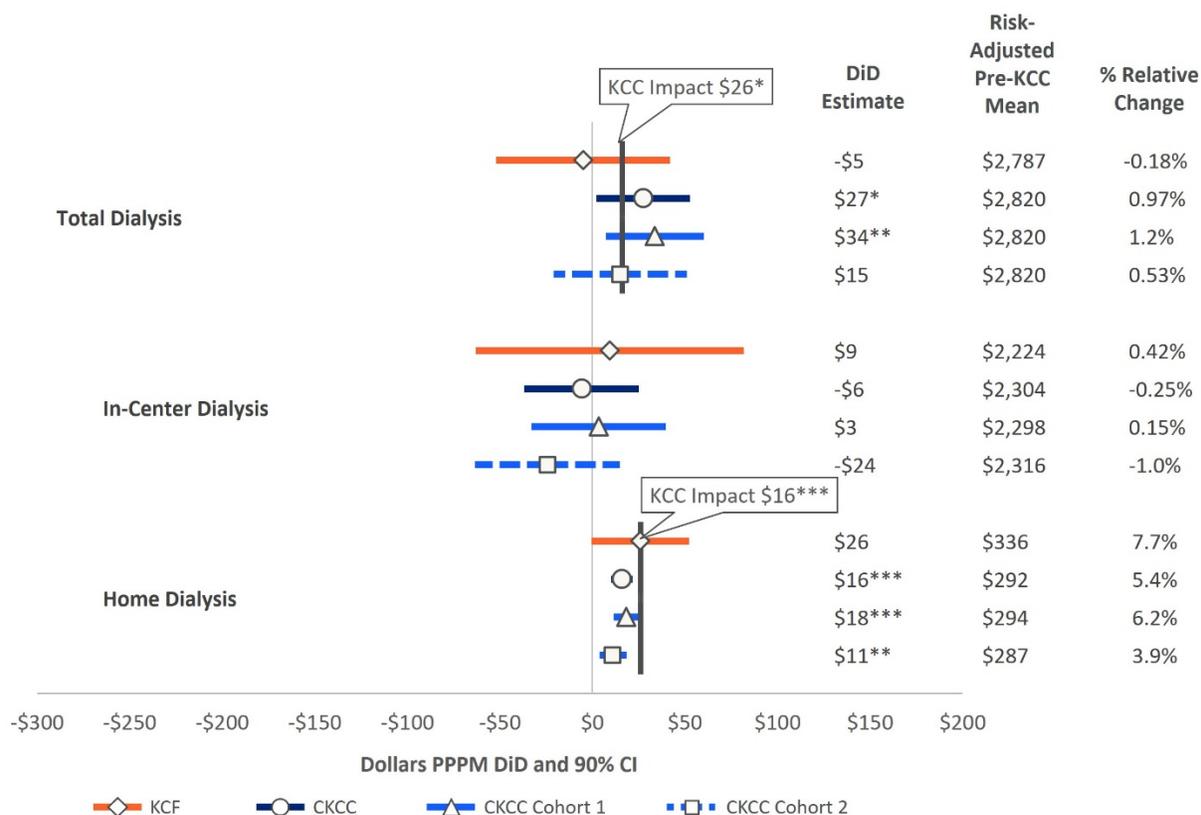
**Findings** | The KCC Model **increased total dialysis payments** and **home dialysis payments**. These results align with shifts in modality use under the model.

Based on the model's incentives, we expect an increase in home dialysis and a decrease in in-center hemodialysis to drive increases in home dialysis payments. At the same time, financial incentives leading to greater adherence to in-center hemodialysis among patients aligned to the KCC Model could lead to increased total dialysis payments. We present the model's impact on dialysis payments in **Exhibit 10** and **Appendix E**.

- In aggregate, the **KCC Model** increased total dialysis payments by \$26 PPPM ( $p < 0.10$ ) relative to the comparison group, or 1% of the pre-KCC mean. Home dialysis payments increased by \$16 PPPM ( $p < 0.01$ ), or 6% of the pre-KCC mean, driven by PD payments (\$23 PPPM increase, or 10% of the pre-KCC mean [ $p < 0.01$ ]).
  - **CKCC** led to a \$27 PPPM increase ( $p < 0.10$ ) relative to the comparison group, or 1% of the pre-KCC mean, in total dialysis payments. Under this model option, home dialysis payments increased by \$16 PPPM ( $p < 0.01$ ) relative to the comparison group, or 5% of the pre-KCC mean, driven by PD payments.

These results align with aggregate increases in home dialysis use and home PD use in the KCC Model in PY 2023. While we may expect to see a reduction from the KCC Model for in-center dialysis payments given the decline estimated for in-center dialysis utilization, the lack of a statistically significant change may be the result of an offsetting increase in payments due to increased adherence. If patients are attending their regularly scheduled appointments for in-center hemodialysis, payments for this component could increase.

**Exhibit 10. Total Dialysis Payments Increased under the KCC Model Due to an Increase in Home Dialysis Payments**



**Note:** Denominator is restricted to patients with ESRD. Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Bars represent the 90% CI. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. CI = confidence interval; DiD = difference-in-differences.

### 3.2.1.4. Net Impact to Medicare

#### Net Impact to Medicare

**Potential Impacts** | The KCC Model could result in net savings to Medicare if it leads to payment reductions that exceed what CMS pays to participants for incentives under the model. The model could increase net Medicare spending if it leads to payment reductions that fall short of incentive payments to participants.

**Findings** | The KCC Model **increased net Medicare spending**, driven by \$189 million in incentive payments to participants.

The KCC Model includes multiple payment mechanisms that may influence total Medicare payments in both the short and long term. Reductions in spending, such as decreased payments for avoidable hospitalizations, are incentivized through shared savings, High Performers Pool payments, and Performance-Based Adjustments, given quality thresholds are met. The Kidney

Transplant Bonus is an additional Medicare payment that in the long term may lead to decreased dialysis payments for patients who receive transplants.

Another KCC payment mechanism is the CKD QCP. The CKD QCP is a lump-sum prospective payment made in lieu of fee-for-service payments for a specific set of evaluation and management services billed by nephrology professionals. The CKD QCP incentivizes diagnosis and management of patients with CKD to slow disease progression and promote Optimal ESRD Starts, including transplants, which could reduce payments in the long run. As such, this component may be costly in the short run, with the goal of reducing expenditures over time.

We estimated net impact to Medicare by calculating the difference between the estimated changes in payments for Total Medicare Parts A & B services and the costs of the KCC Model. We present the impacts on net Medicare spending in **Exhibit 11** and **Appendix E**.

- The **KCC** Model led to statistically significant net increases in Medicare spending of \$304.8 million.
  - The **KCC** Model had a non-statistically significant aggregate increase in Total Medicare Parts A & B payments (gross losses) of \$115.6 million (90% confidence interval [CI]: -\$240.8 million, \$9.5 million).<sup>25</sup>
  - CMS payments to participants throughout PY 2023 and during financial reconciliation totaled \$189.1 million.

Within the non-statistically significant gross losses, the **CKCC** model option accounted for -\$91.5 million (90% CI: -\$209.3 million, \$26.2 million), while the **KCF** option accounted for -\$24.1 million (90% CI: -\$57.5 million, \$9.3 million).<sup>26</sup>

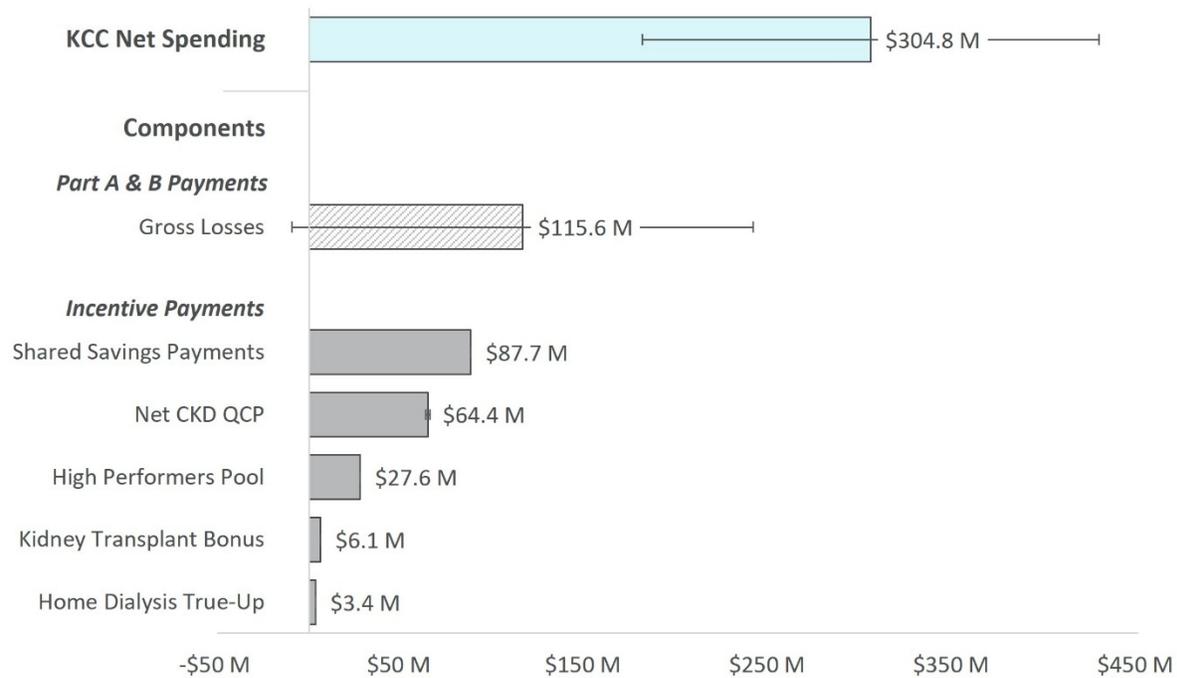
The **KCC** Model's shared savings payments (\$87.7 million) served as the largest component of the payments that CMS paid to participants, followed by CKD QCP payments (\$64.4 million). The CKD QCP replaces fee-for-service payments for a select set of evaluation and management services from nephrology professionals for patients with CKD (for example, outpatient office visits; see **Appendix E** for full list). The cost to CMS due to the KCC Model is the difference between the CKD QCP paid amount and the estimated fee-for-service amount for these services. To calculate the net impact of the model on Medicare, we also accounted for all other payments made from CMS to participants, including the High Performers Pool payments \$27.6 million, Kidney Transplant Bonus payments (\$6.1 million), and Home Dialysis True-Up payments (\$3.4 million).

We identified a statistically significant increase in net Medicare spending for **CKCC** in PY 2023 of -\$275.4 million (90% CI: -\$392.0 million, -\$158.8 million) and did not find a statistically significant change for **KCF**.

<sup>25</sup> This amount excludes CKD QCP services billed by nephrology professionals and does not account for financial reconciliation payments between participants and CMS.

<sup>26</sup> See **Appendix E** for a detailed calculation of net impact.

**Exhibit 11. The KCC Model Led to Increases in Net Medicare Spending**



**Note:** Bars represent the 90% CI. Impact estimates are multiplied by patient-months, which were provided by the implementation contractor to obtain aggregate, annual estimates. CI = confidence interval; DiD = difference-in-differences; CKD QCP = CKD Quarterly Capitated Payment; M = million.

**3.2.2. Impacts of the KCC Model on Quality of Care**

In addition to assessing changes in utilization and cost, we investigated whether the model affected quality of care based on measures that apply specifically to patients with CKD Stage 4 or 5, patients with ESRD, or both patient populations. For patients with CKD, we examined several measures related to the medications patients are prescribed, their laboratory tests, and how they prepare for the progression to ESRD. For patients with ESRD, we examined outcomes such as improved care prior to the start of ESRD, vascular access, ESRD-related hospitalizations, and medication adherence. Finally, we estimated the effects of the model on waitlisting, transplantation, and survival. We present select outcomes in this section, and complete results are in **Appendix E**.

**3.2.2.1. Quality of Care for Patients with Advanced CKD**

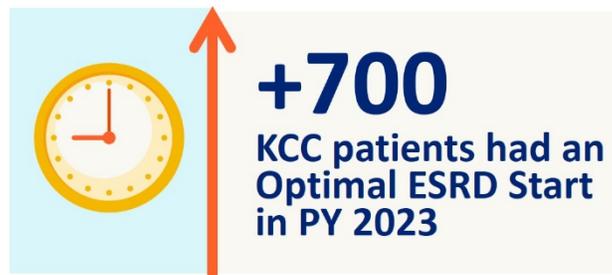
**Optimal ESRD Starts**

**Potential Impacts** | Financial accountability for the Optimal ESRD Starts quality measure could lead to improvements in planned starts of renal replacement therapy under the KCC Model.

**Findings** | The KCC Model **increased Optimal ESRD Starts**. Participants reported that providing more robust education on ESRD treatment options was key to ensuring an optimal start.

An Optimal ESRD Start occurs when a patient starts home dialysis, starts in-center hemodialysis with preferred vascular access (arteriovenous fistula and graft rather than a central venous catheter), or receives a preemptive kidney transplant.<sup>27</sup> Starting kidney replacement therapy in a planned way can reduce the risk of infections associated with catheters, reduce hospitalizations, and lower costs. The Optimal ESRD Starts measure is one of the KCC quality measures that is tied to payment. Thus, we would expect Optimal ESRD Starts to increase under the model. We present the model's impact on Optimal ESRD Starts in **Exhibit 12** and **Appendix E**.

- In aggregate, the **KCC Model** increased Optimal ESRD Starts by 12.4 pp ( $p < 0.01$ ) relative to the comparison group, or 31% of the pre-KCC mean.
  - **CKCC** increased Optimal ESRD Starts by 12.4 percentage points ( $p < 0.01$ ) relative to the comparison group, or 31% of the pre-KCC mean.



Of the components in Optimal ESRD Starts, increases in the creation of hemodialysis vascular access as well as in the uptake of home dialysis, particularly PD, were the main improvements seen in the KCC Model; however, there was little difference in preemptive transplantation relative to the comparison group.

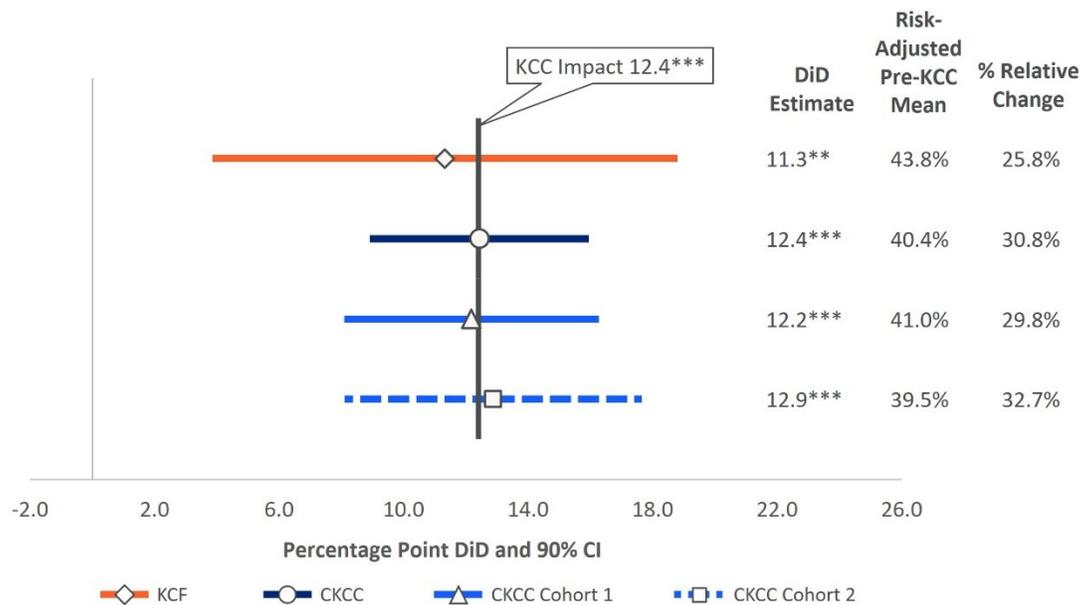
Participants reported that more frequent CKD visits were often used to focus on modality education and earlier referral for surgical vascular access placement. KCE participants also noted that providing more robust modality education and using staff from integrated kidney care organization partners to follow up with patients after modality education were key to helping with decision-making and ensuring an optimal start.

*“Front and center right now for us is the ability for our patients to transition [to ESRD] optimally ... We have pretty tangible data that that lets us know that we're really making improvements there.”*

– KCE Participant

<sup>27</sup> On average, of the three categories that make up the Optimal ESRD Start measure, vascular access is the majority followed by home dialysis and preemptive transplant.

**Exhibit 12. The KCC Model Increased Optimal ESRD Starts**



**Note:** Denominator consists of patients with CKD Stage 4 or 5, ESRD, or transplant. Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Bars represent the 90% CI. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. CI = confidence interval; DiD = difference-in-differences; PPM = per patient per month.

### Delaying CKD Progression

**Potential Impacts** | The KCC Model’s inclusion of patients with CKD Stage 4 and 5 and improved care coordination and management encouraged by the CKD QCP could result in delayed progression of CKD.

**Findings** | Overall, the KCC Model **did not delay CKD progression**. Participants reported that slowing disease progression can be challenging for patients who have already advanced to CKD Stage 4 or 5.

Delaying progression of kidney disease for patients with CKD 4 Stage and 5 is a core component of the KCC Model and a key goal of nephrology practice. Several interventions, such as blood pressure control, use of angiotensin converting enzyme (ACE) inhibitors/angiotensin-receptor blockers (ARB), use of sodium-glucose cotransporter-2 (SGLT2) inhibitors, and multidisciplinary care, have been demonstrated to delay progression to kidney failure.

We found no difference in the proportion of patients with CKD Stage 4 who progressed to starting dialysis in the KCC Model relative to the comparison groups. We estimated several alternative models, including one that looked at a composite outcome of progression from CKD Stage 4 to CKD Stage 5, preemptive transplant, ESRD, or death. Results of the various models were generally consistent (see **Appendix E**).

In interviews and site visits, KCC Model participants reported multiple challenges to achieving delayed progression and noted that efforts to slow disease progression are more likely to be effective when started earlier (that is, CKD Stage 3) given the high risk for progression by the time patients reach CKD Stage 4 and 5. Patients have non-kidney-related comorbidities that need to be managed and may have received minimal recent care for those conditions. Several participants mentioned that progression metrics may take multiple years to detect a difference, given that CKD progression can be slow for some patients.

### eGFR Testing/Labs

**Potential Impacts** | Financial incentives such as the CKD QCP could prompt KCC participants to increase uptake in eGFR testing to better monitor patients' disease severity, help delay progression from CKD Stage 4 or 5 to ESRD, and place patients on the waitlist preemptively.

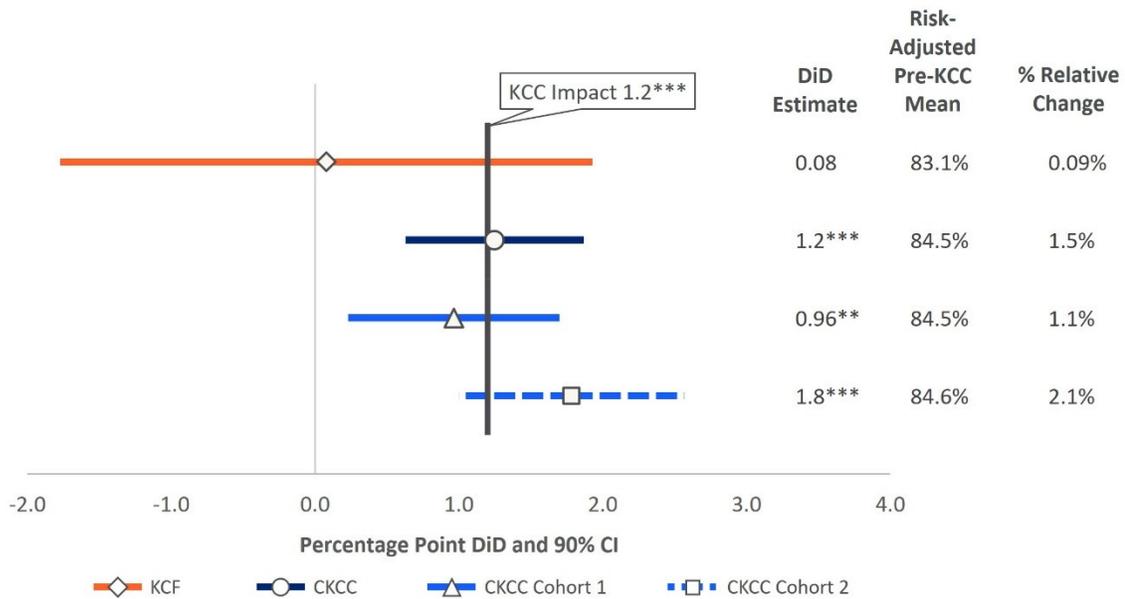
**Findings** | The KCC Model **increased eGFR testing**, which could indicate providers are doing more to monitor kidney function and manage CKD progression.

Patients with CKD Stage 4 or 5 are at increased risk of progression to ESRD and require more frequent monitoring of kidney function. This is particularly true in the context of avoiding unplanned starts for dialysis and referring patients for a preemptive kidney transplant evaluation. Many treatment decisions are based on eGFR thresholds (for example, transplant evaluation at eGFR of 20 ml/min), so knowledge of a patient's eGFR trajectory is important in timely modality education, vascular access planning, and surgical referrals. We present the model's impact on quarterly eGFR testing in **Exhibit 13** and **Appendix E**.

- In aggregate, the **KCC** Model increased quarterly eGFR testing by 1.2 pp (p<0.01) relative to the comparison group, or 1% of the pre-KCC mean.
  - The **CKCC** model option increased quarterly eGFR testing by 1.2 pp (p<0.01) relative to the comparison group, or 1% of the pre-KCC mean.

The relative increase in eGFR testing was small but reasonable given the high quarterly use. The increase aligns with the increase in preemptive waitlisting also observed in PY 2023.

**Exhibit 13. The KCC Model Increased Quarterly eGFR Testing**



**Note:** Denominator is restricted to patients with CKD Stage 4 or 5. Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate quarterly DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Bars represent the 90% CI. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. CI = confidence interval; DiD = difference-in-differences; PPPQ = per patient per quarter.

### CKD QCP Services from Nephrology Providers

**Potential Impacts** | Nephrology providers may increase the use of CKD QCP services to enhance care coordination or may limit these services because the capitated amount is independent of the number of services delivered.

**Findings** | The KCC Model led to an **increase in the number of CKD QCP services**, suggesting that providers used CKD QCP services to improve care coordination.

As described earlier, the CKD QCP is a lump-sum prospective payment made for certain evaluation and management services (such as wellness visits and chronic care management services) billed by nephrology professionals. Unlike retrospective payments under fee-for-service Medicare, the CKD QCP is meant to give nephrology professionals up-front, predictable payments to assist in the care management of patients with CKD, which may increase the use of these services. However, because nephrology professionals are paid a fixed amount independent of the number of services delivered, they might limit the services provided or reported and invest in other care management not reflected by this measure.

We found a small increase in the number of CKD QCP services rendered by nephrology professionals in the KCC Model of 0.05 PPPM ( $p < 0.01$ ) relative to the comparison group, or 4%

of the pre-KCC mean (see **Appendix E**). The modest increases in CKD QCP services suggest providers are taking steps to pursue additional care coordination rather than reducing visits under the capitated payment structure. In site visits, some providers said they appreciated the stable payment structure while being able to provide patients with the amount of care they required.

*“Personally, I think the [CKD QCP] is [great] because it takes the onus off of having to worry about, you know, if I want to see them in a week, I’ll see them in a week. If I don’t have to see him for 3 months, I’ll see him in 3 months.”*

– KCE Physician

### 3.2.2.2. Quality of Care for Patients with ESRD

#### Vascular Access

**Potential Impacts** | Accountability for the Optimal ESRD Starts quality measure could result in increased arteriovenous fistula and graft use and decreased catheter use for dialysis under the KCC Model.

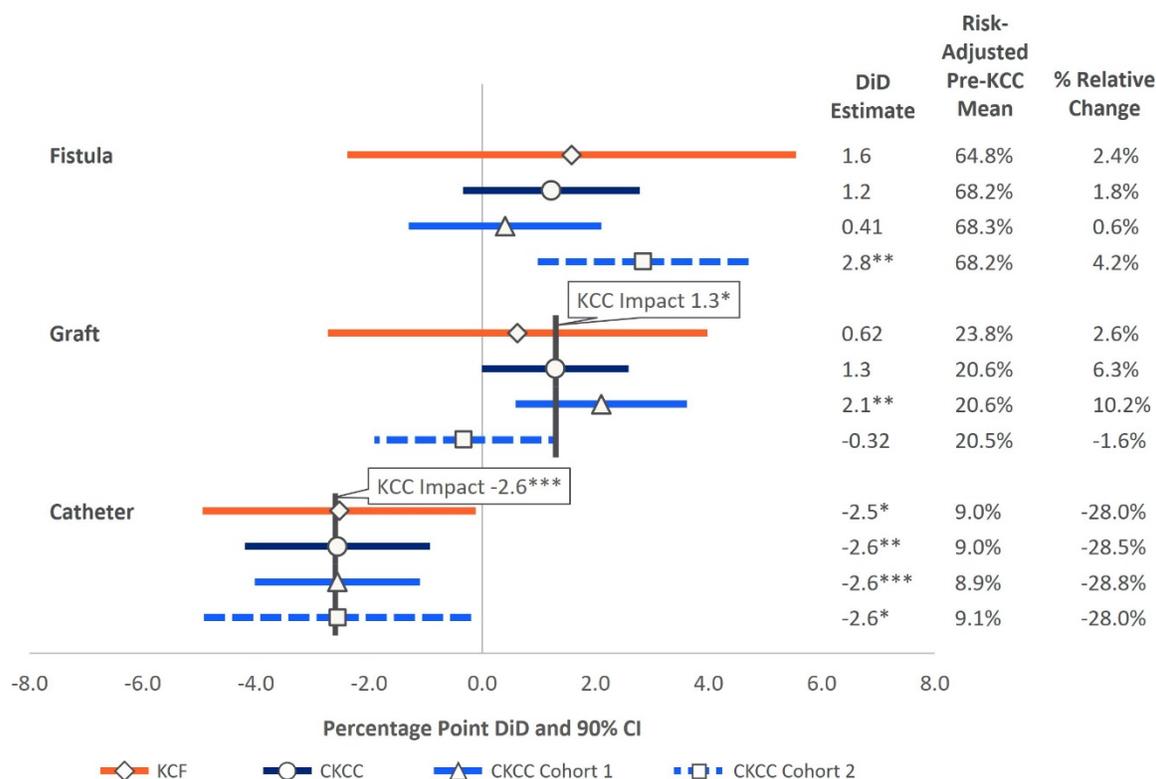
**Findings** | The KCC Model **increased AV graft use**, a preferred mode of vascular access, and **led to declines in catheter use**, which is generally considered less safe than other types of vascular access.

The KCC Model **did not affect the frequency of hospitalizations for ESRD or vascular access complications**.

High-quality medical care, including factors such as vascular access type, can reduce the risk of ESRD-related complications. Dialysis using an arteriovenous fistula or graft is associated with a lower risk of complications such as infections than dialysis using a catheter. However, these forms of dialysis access require more planning and surgical consultation than catheter placement. If a patient "crashes" into dialysis, meaning they were not receiving consistent care from a nephrologist before kidney failure, they are more likely to receive a catheter. By incentivizing higher-quality care and patient education, we expect that KCC patients will have lower rates of catheter placement and higher rates of fistula or graft use.

The model had positive effects on graft use, a preferred form of vascular access, and led to an overall relative decline in catheter use. In aggregate, the **KCC Model** decreased catheter use by 2.6 pp ( $p < 0.01$ ) relative to the comparison group, or 29% of the pre-KCC mean, and increased arteriovenous graft use by 1.3 pp ( $p < 0.10$ ) relative to the comparison group, or 6% of the pre-KCC mean (see **Exhibit 14** and **Appendix E**). As these outcomes are a component of the Optimal ESRD Starts measure, which also improved under the model, the results follow a consistent trend.

**Exhibit 14. The KCC Model Decreased Catheter Use and Increased Graft Use**



**Note:** Denominator is restricted to patients with ESRD. Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Bars represent the 90% CI. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. CI = confidence interval; DiD = difference-in-differences; PPM = per patient per month.

Increased kidney disease education and patient-centered care could allow patients to be better prepared and supported through their dialysis treatment. Such improvements, in addition to lower use of catheters, could lead to fewer common complications for patients with ESRD. While both model options reduced catheter use, we did not see a corresponding statistically significant decline in hospitalizations for ESRD complications or vascular access complications (see **Appendix E**).

**3.2.2.3. Quality of Care for Patients with Advanced CKD or ESRD**

**Hospitalizations or ED Visits for Hyperkalemia or Fluid Overload**

**Potential Impacts** | Given the potential for shared savings or losses under CKCC, providers may improve efforts to decrease hospitalizations due to hyperkalemia and fluid overload, which are common complications.

**Findings** | Overall, the KCC Model **did not affect hospitalizations due to hyperkalemia or fluid overload.**

A major goal of the KCC Model is to promote patient education and choice in the ESRD treatment selection process, with the expectation that use of home dialysis modalities will grow and reliance on in-center hemodialysis will decrease. To be successful, providers must focus on supporting decision-making and informing patients with advanced CKD or ESRD about how to prevent complications that can result in hospital visits.

Complications such as hyperkalemia and fluid overload occur when patients miss or shorten dialysis treatments or cannot adequately manage their diet and fluid intake. Care improvements under the KCC Model could result in fewer occurrences of these complications. In PY 2023, we did not find a statistically significant impact on these measures (see **Appendix E**).

### 3.2.2.4. Kidney Transplant Waitlisting

#### Waitlisting

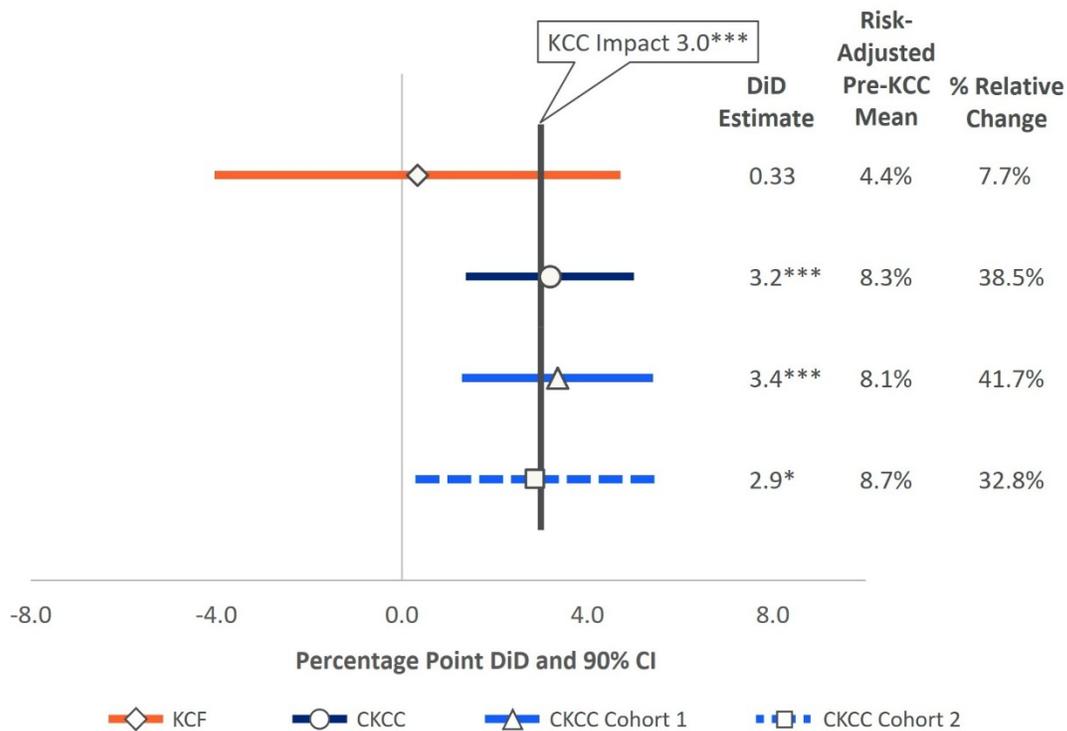
**Potential Impacts** | The KCC Model's Kidney Transplant Bonus could incentivize providers to increase the rate of kidney transplant waitlisting, a required step prior to deceased donor transplantation.

**Findings** | The KCC Model **increased preemptive waitlisting**, a potential precursor to preemptive transplantation. The model **did not affect active waitlisting**, a status indicating suitability for immediate transplantation.

Although not directly incentivized under KCC, registration on the transplant waitlist is a required step prior to deceased donor transplantation, which is incentivized by the model. If achieved before the patient needs to start dialysis, it is called *preemptive waitlisting*, a potential precursor to preemptive transplantation. To get on the kidney transplant waitlist, patients must be referred for evaluation (typically by their nephrologist) to a transplant center for a comprehensive workup that includes testing to make sure the patient is healthy enough and meets the transplant hospital's criteria for a kidney transplant. Once patients are waitlisted, *active waitlisting* status is important because it means patients are deemed suitable for immediate transplantation once an organ becomes available. Participants in the model may work to increase both waitlisting and active waitlisting status as strategies to increase rates of transplantation. We present the model's impact on preemptive waitlisting in **Exhibit 15** and impacts on all waitlisting measures in **Appendix E**.

- In aggregate, the **KCC Model** increased preemptive waitlisting by 3.0 pp ( $p < 0.01$ ) relative to the comparison group, or 37% of the pre-KCC mean, but did not have a statistically significant impact on overall waitlisting or active waitlisting status.
  - The **CKCC** model option increased preemptive waitlisting by 3.2 pp ( $p < 0.01$ ) relative to the comparison group, or 39% of the pre-KCC mean.

**Exhibit 15. The KCC Model Increased Preemptive Waitlisting**



**Note:** Denominator is restricted to patients with CKD Stage 5. Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Bars represent the 90% CI. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. CI = confidence interval; DiD = difference-in-differences; PPM = per patient per month.

Nephrology practices can increase waitlisting by properly educating patients about the transplant option, referring patients for transplant evaluation, maintaining patients’ optimal health status to improve candidacy for transplantation, and assisting with the completion of testing for the evaluation process or maintenance on the waitlist. In interviews, participants emphasized the importance of the Kidney Disease Patient Education Services benefit for patient education about the transplant option, as well as the deployment of care coordinators, which may have contributed to patient readiness for waitlisting.

*“Having the navigators on the ground locally has really beefed up and sped up that [transplant evaluation] process. So, I think it's more patient friendly in the sense that they don't have to move as far to get evaluations and tests done.”*

– KCE Physician

Some participants also reported investing in creating new transplant coordinator or patient navigator roles to support patients through the evaluation process. The KCC Model’s increase in preemptive waitlisting may reflect a participant strategy to improve performance on the Optimal ESRD Starts measure, which includes preemptive transplantation as an optimal start.

### 3.2.2.5. Living and Deceased Donor Kidney Transplants

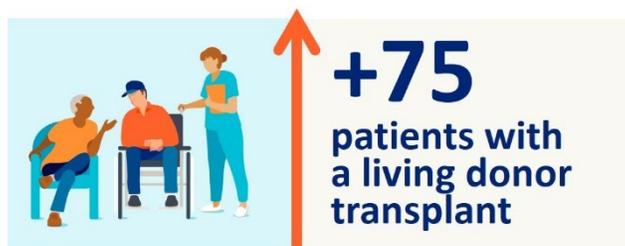
#### Transplants

**Potential Impacts** | The KCC Model could improve kidney transplant rates through the Kidney Transplant Bonus and accountability for the Optimal ESRD Starts measure, which incentivizes transplantation and affects shared savings under CKCC.

**Findings** | The KCC Model **increased living donor transplant rates**.

The model incentivizes living and deceased donor kidney transplantation through several mechanisms. Participants can earn shared savings in the CKCC model option by constraining costs, which may be achieved by providing more transplant care, given that transplant care is less costly than dialysis care after the initial surgery period. In addition, the Optimal ESRD Starts quality measure includes preemptive transplants, which are frequently living donor transplants, as one of its components. Finally, the model includes the Kidney Transplant Bonus, which pays up to \$15,000 per transplant (living or deceased donor) over a 3-year period, dependent on ongoing transplant graft survival. We present the model's impacts on living donor transplants in **Exhibit 16** and overall, deceased donor, and preemptive transplants in **Appendix E**.

- The KCC Model increased *living donor* transplants by 0.16 transplants per 1,000 patient-months ( $p < 0.10$ ), or 22% of the pre-KCC mean.
  - The CKCC model option increased *living donor* transplants by 0.19 transplants per 1,000 patient-months ( $p < 0.05$ ), or 27% of the pre-KCC mean.
- The KCC Model did not have a statistically significant impact on *overall* transplants, *deceased donor* transplants, or *preemptive* transplants.



Beyond efforts to increase waitlisting and improve transplant education, about living donor transplantation in particular, strategies that participants could deploy to increase transplant rates include partnering with transplant providers (as required in CKCC) to optimize use of available organs (for example, participation in kidney paired living donor exchange programs). One KCE physician noted the benefits of putting resources toward transplant coordinators within the practice.

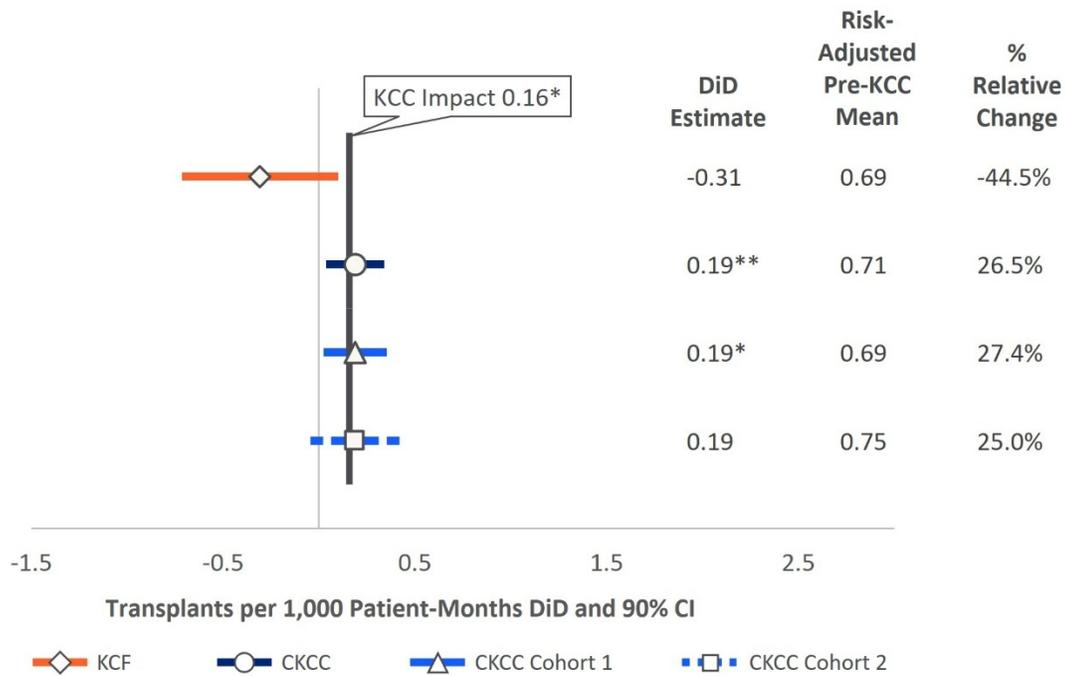
*"I think, from a practice perspective, the resource allocation that we've put to our internal transplant coordinators has really been a boon for our patients and for our clinicians."*

– KCE Physician

However, many participants that we interviewed cited difficulties in their relationships with transplant centers and only limited early success in overcoming those difficulties. Examples included staff turnover at the transplant centers that required rebuilding of relationships, poor communication, distance for rural patients to centers (impairing their ability to get through the process, particularly for lower-income patients), and transplant centers not wanting to give special treatment or preference to patients aligned to the model. One participant noted that its healthier patients often switched to Medicare Advantage, so it would do the work on waitlisting but not get the reward when the transplant occurred after the insurance switch.

The transplant ecosystem is complex and includes numerous stakeholders. The transplant rate largely depends on the organ supply as well as transplant center and organ procurement organization behavior. While we saw some effects in PY 2023, more significant changes in these outcomes might take time to emerge.

**Exhibit 16. The KCC Model Increased Living Donor Transplants**



**Note:** Denominator is restricted to patients with ESRD or CKD Stage 5. Pre-KCC period is January 2017–December 2019. KCF and CKCC impact estimates were obtained from separate DiD regression models with separate comparison groups. The DiD impact estimate reflects the difference in the risk-adjusted mean outcome for patients in the KCF or CKCC group in PY 2023 with the pre-KCC period relative to the same difference over time for patients in the comparison group. Bars represent the 90% CI. The percent relative change is the proportion of the estimated DiD impact estimate relative to the KCF or CKCC group risk-adjusted pre-KCC mean. \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. CI = confidence interval; DiD = difference-in-differences; PPPM = per patient per month.

### 3.2.2.6. Survival

#### Survival

**Potential Impacts** | The KCC Model could improve survival through increased rates of kidney transplantation as well as improved care coordination and management.

**Findings** | Overall, the KCC Model **did not affect survival** in either the KCF or CKCC options.

While mortality rates among patients with ESRD on dialysis have decreased in recent years, dialysis patients continue to have higher mortality versus age-matched Medicare patients without ESRD.<sup>28</sup> In addition, mortality among patients with ESRD on dialysis varies across dialysis facilities, even after adjustment for patient characteristics.<sup>29</sup> Overall mortality is one of several important health outcomes used by providers, patients, and insurers to evaluate the quality of care for kidney disease.

The KCC Model had no impact on all-cause mortality in either the KCF or CKCC model options (see **Appendix E**). Although kidney transplants are associated with improved mortality relative to treatment with dialysis, there is also up-front risk in the immediate postoperative period that needs to be overcome before lower mortality is realized. Additional follow-up time may be needed to determine whether the model is associated with improved mortality related, in part, to increases in transplants. Finally, because mortality is lower in patients who have CKD Stage 4 and 5 compared with patients who have ESRD, delayed progression, which we did not observe in PY 2023, would also be expected to decrease mortality rates.

<sup>28</sup> United States Renal Data System. (2024). *2024 USRDS annual data report: Epidemiology of kidney disease in the United States*. National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. <https://usrds-adr.niddk.nih.gov/2024/>

<sup>29</sup> Centers for Medicare & Medicaid Services. (2025). *Dialysis facility - Listing by facility*. <https://data.cms.gov/provider-data/dataset/23ew-n7w9>

## 4. Did the KCC Model Affect Patient Experience of Care and Quality of Life?



### Key Findings

#### Patient Care Experience

The KCC Model could improve patient care experiences by enhancing patient education and shared decision-making. **The model was associated with more patients with CKD receiving information about treatment modalities.**

#### Patient Activation

The KCC Model may enable providers to better identify and support patients with low activation (their ability to manage their health and health care). From the first to last PAM survey, **KCC patient activation scores increased overall and across patient subgroups.**

#### Patient Quality of Life

Improved care coordination could lead to better quality of life for patients under KCC through management and treatment of physical and mental health symptoms. **The model was not associated with clinically meaningful improvements in quality of life.**

Favorable Neutral

Patient-reported outcomes are a direct way to understand the impact of the KCC Model on patient experience with care, patient activation, and health-related quality of life based on self-reports of health status and experience with care delivery.

In this section, we summarize the results of five patient surveys that together represent patient-reported experiences and well-being of populations across different stages of kidney disease and treatment.

### 4.1. Methods

We used varying methods to collect and analyze data from the five patient surveys. Detailed methods for each survey are provided in the appendices (see **Appendix C: CKD Patient Experience of Care, Home Dialysis Care Experience, and Patient Quality of Life; Appendix G: In-Center Hemodialysis Consumer Assessment of Healthcare Providers and Systems [ICH CAHPS]; Appendix H: Patient Activation Measure [PAM]**).

### 4.2. Results and Discussion

#### 4.2.1. Patient Experience

We analyzed responses from three surveys to assess patient-reported care experiences under the KCC Model. Although reduced quality is a potential concern in any model intended to lower the total cost of care in a vulnerable population, we did not anticipate such an effect given that the existing ESRD Quality Incentive Program (QIP), which includes ICH CAHPS, incentivizes all dialysis facilities to prioritize quality of care and patient experience regardless of their participation in the KCC Model.

Acronyms	
CI	confidence interval
CKD	chronic kidney disease
ESRD	end-stage renal disease
ICH CAHPS	In-Center Hemodialysis Consumer Assessment of Healthcare Providers and Systems
KCC	Kidney Care Choices
KCE	Kidney Contracting Entity
KCF	CMS Kidney Care First
LCI	lower confidence interval
PAM	Patient Activation Measure
PROMIS	Patient-Reported Outcomes Measurement Information System
PY	performance year
UCI	upper confidence interval

We report the results of the CKD Patient Experience of Care and Home Dialysis Care Experience Surveys below. Results of our ICH CAHPS Survey analysis, which were not clinically meaningful, are provided in **Appendix G**.

### Patient Experience

**Potential Impacts** | Improved patient education and shared decision-making could result in better patient-reported care experiences for KCC patients.

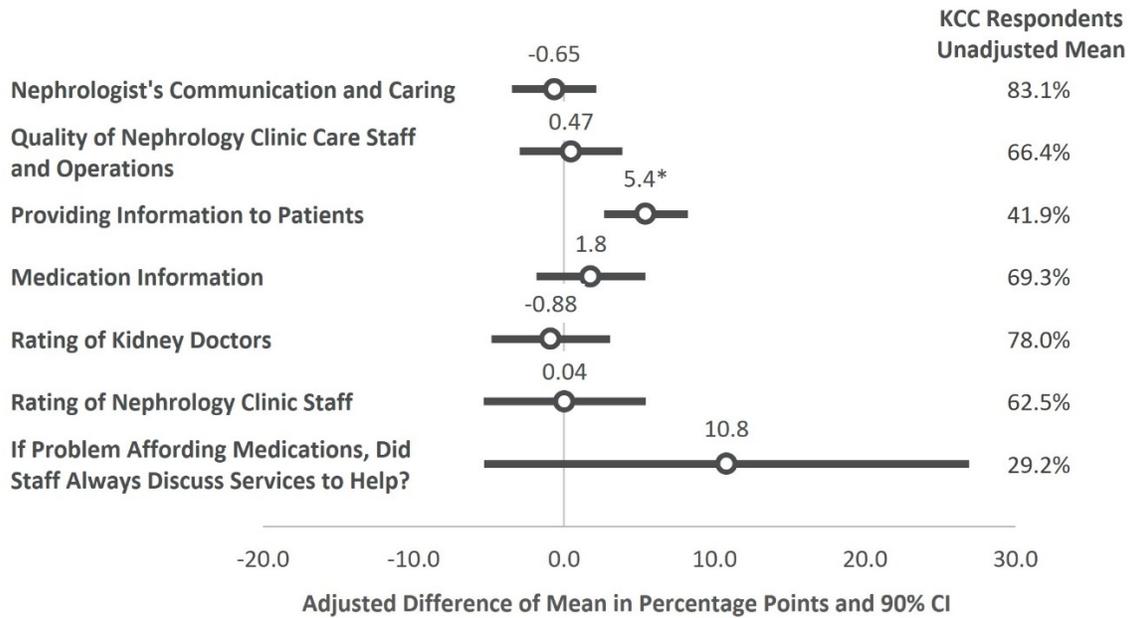
**Findings** | The KCC Model was **associated with more patients with CKD receiving information** about treatment modalities, which can empower them to make informed decisions about their care.

The model was **not associated with better care experiences** for patients using home dialysis care.

The CKD Patient Experience of Care Survey—notably the first nationally fielded survey of patient experience of care for Medicare beneficiaries with CKD Stage 4 or 5—asks patients with CKD Stage 4 and 5 about the quality of their nephrology care as well as the education they are receiving about treatment options should they progress to ESRD. In this survey, we also asked patients whether their provider has discussed medications with them, including medication management, side effects, and affordability. For patients with advanced CKD, comprehensive education about available ESRD treatment options is an important aspect of their care experience because it enables patients to make informed choices. These patients are also often on many medications, which can be confusing and expensive. The KCC Model could encourage participants to enhance patient education and shared decision-making, and in turn, we may expect to see better care experiences reported by patients under the model.

For most domains of the CKD Patient Experience of Care Survey, we did not find a statistically significant difference in outcomes between KCC and comparison patients when adjusting for a variety of characteristics (see **Exhibit 17**), with one exception: A higher percentage of KCC patients reported receiving information from their providers than comparison patients, including information on ESRD treatment, eligibility for transplantation, living donor transplantation, and peritoneal dialysis (difference in scores of 5.4 percentage points,  $p < 0.10$ ). These results suggest that KCC Model participants have taken steps to improve patient education about ESRD as well as dialysis and transplant options.

**Exhibit 17. A Higher Share of KCC Patients with CKD Received Information from Providers Than Comparison Patients**



**Note:** Significance of the estimate is indicated next to each mean difference, where \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. Bars represent the 90% CI. Standard errors are clustered at the provider Taxpayer Identification Number level. Regression model adjusts for region, urban/metro, age, sex, and other demographic characteristics. Results were weighted to account for sampling stratification and nonresponse by region, sex, dual eligibility, and other demographic characteristics. Survey was fielded in spring 2024, and treatment status is defined as of December 2022. Results represent cross-sectional differences between the treatment and comparison group and do not adjust for differences existing prior to treatment. CI = confidence interval.

The Home Dialysis Care Experience Survey assesses the care experience of patients with ESRD who are using home dialysis. It focuses on the quality of care and support patients are receiving from home dialysis staff at their dialysis center. After adjusting for patient and facility characteristics, we found no statistically significant differences between the KCC treatment and comparison groups for the three composite home dialysis patient care experience measures (see Appendix C for detailed results).

**4.2.2. Patient Activation**

**Patient Activation Measure**

**Potential Impacts** | KCC participants could use PAM surveys to assess patients' ability to manage their conditions and support those with low activation, potentially leading to better health outcomes and more personalized care.

**Findings** | Gains in patient activation scores were clinically meaningful and statistically significant, although not attributable to the model.

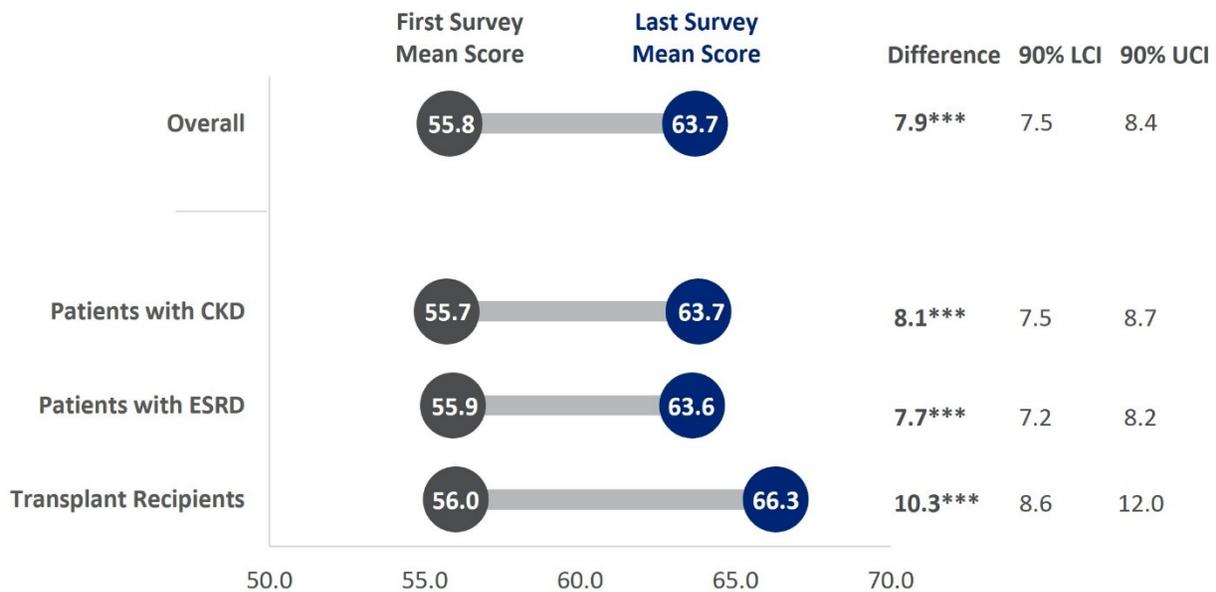
The PAM survey is included in the KCC Model as a quality measure to assess patients' ability to manage their own health and health care. By incentivizing improvement in patient activation, the KCC Model encourages providers to increase patient outreach and care coordination and to

empower patients with CKD and ESRD to take a more active role in their care, which can lead to better health outcomes and improved quality of care.

Patient activation scores increased overall and across patient subgroups in PY 2023 (see **Exhibit 18** and **Appendix H**). The average score for KCC survey participants from the first to the last PAM survey increased by 7.9 points (90% confidence interval [CI]: 7.5, 8.4). The largest mean increase in PAM survey scores occurred in patients with transplants, with a mean risk-adjusted score difference of 10.3 points (90% CI: 8.6, 12.0).

The increase in PAM scores cannot be attributed to the KCC Model because comparison group responses and pre-KCC responses from participants are not available.

**Exhibit 18. Risk-Adjusted Average PAM Survey Scores Increased from the First to the Last Survey in PY 2023**



**Note:** Patients who scored a Level 4 at the time of their first survey, patients who took their first and last surveys closer than 4 months apart, and patients who took two PAM surveys on the same day at the same time and received different scores were dropped from the analysis. Significance of the estimate is indicated next to each mean difference, where \* implies significance at the 10% level, \*\* at the 5% level, and \*\*\* at the 1% level assuming a two-tailed test. These categories were combined due to the small sample size. LCI = lower confidence interval; UCI = upper confidence interval; PAM = Patient Activation Measure.

Interviews and site visits with providers suggest that KCEs and KCF Practices found the PAM survey to be a helpful tool for evaluating patient engagement and managing care. One KCE used the PAM question about whether patients understand their medications to target educational pharmacist visits, and a KCF Practice used the PAM survey to target the frequency and content of office visits. Patients with poor activation would be scheduled for more visits, but each visit would focus on a single issue to ensure understanding; more highly activated patients would have fewer visits, with each visit addressing multiple issues.

*"I think the biggest challenge is we're just logistically working this additional effort into our workflow and, especially for me, taking on the extra burden of having to organize and make sure the patients were getting their surveys on time."*

– KCF Participant

While some participants identified benefits of the PAM, others felt survey administration was burdensome.

### 4.2.3. Patient Quality of Life

#### Patient Quality of Life

**Potential Impacts** | The KCC Model could enhance quality of life for patients aligned to the model through improved disease management and treatment of physical and mental health symptoms.

**Findings** | The KCC Model was **not associated with clinically meaningful differences in quality of life.**

Under the KCC Model, improved communication about treatment options could mean that more patients are being connected to a treatment modality that better aligns with their lifestyle and preferences. Additionally, better disease management and care coordination may facilitate improved treatment of physical and mental health symptoms. In turn, KCC patients may report better quality of life than patients in the comparison group.

We assessed patient quality of life through the Patient-Reported Outcomes Measurement Information System (PROMIS)-29 survey, which asks about physical function and ability to participate in social activities as well as symptoms such as anxiety, depression, and fatigue. In the analysis adjusting for demographic factors, scores for anxiety, depression, pain interference, and pain intensity were slightly more favorable for the KCC treatment group than for the comparison group (see **Appendix C** for detailed results). Scores for sleep disturbance were less favorable for the KCC treatment group but well within normal limits. Although statistically significant at the  $p < 0.10$  level, these differences were small and not clinically meaningful.

## 5. Discussion

In its second performance year, the KCC Model showed promising signs of increasing quality of care, and participants have made measurable progress on some of the model’s stated goals, including shifting patients toward home dialysis. Despite evidence of progress on a number of key care and quality outcomes, the model has not resulted in Medicare savings to date and increased net Medicare spending in PY 2023.

Acronyms	
CKCC	Comprehensive Kidney Care Contracting
CKD	chronic kidney disease
CMS	Centers for Medicare & Medicaid Services
ESRD	end-stage renal disease
ETC	End-Stage Renal Disease Treatment Choices
IOTA	Increasing Organ Transplant Access
KCC	Kidney Care Choices
KCE	Kidney Contracting Entity
KCF	CMS Kidney Care First
PAM	Patient Activation Measure
PY	performance year

Given that KCC relies on voluntary participation, understanding who participated can inform our understanding of model impacts and policy decisions. Most Cohort 1 participants remained, and model participation rose substantially in the second performance year, which included the addition of Cohort 2 participants that joined the model in PY 2023. Overall, the CKCC model option represents the vast majority of model participants; thus, impact estimates for the overall KCC Model most closely reflected the performance of KCEs. Conversely, there was less statistical power to assess performance specific to the KCF model option.

Participating practices were larger in terms of aligned patients and operated in larger, more densely populated markets than nonparticipating practices. We also found some variation in overlap with Comprehensive ESRD Care (CEC) and ESRD Treatment Choices (ETC) Model participation. These differences suggest that improvements in care delivery driven by the model may be less accessible for patients in rural and less densely populated areas and may be more challenging without prior or concurrent CMS Innovation Center model experience.

In this second evaluation report, we found that participants made improvements in several key quality and utilization outcomes. The model increased rates of home dialysis and increased the proportion of patients in the model who received home dialysis training, suggesting that the increase in home dialysis use may persist. Notably, these model-associated increases in home dialysis utilization and training come in addition to the overall increasing trends observed nationally.

*“There’s in the hospital education from Kidney Smart ... a new thing for us for crash landers, and I’ve been able to start some of the crash landers on home dialysis rather than [in-center] hemo[dialysis], right from the start. So that’s the success story in the value-based process—to be able to introduce new patients to home modalities.”*

– KCE Physician

Another important goal of the KCC Model is slowing the progression of CKD; however, we did not find impacts on this outcome in PY 2023. In interviews with participants, multiple respondents suggested that aligning patients starting at CKD Stage 3 would allow more time to intervene. Clinically, Stages 4 and 5 are already advanced, and arresting progression may be harder once kidney function has deteriorated to that stage.

We found improvements in several other quality outcomes in PY 2023. The rate of optimal starts of renal replacement therapy increased—a composite of starting on home dialysis, starting

hemodialysis with permanent vascular access in place, or receiving a preemptive transplant. Relatedly, hemodialysis catheter use decreased and arteriovenous graft use increased for KCC patients relative to the comparison group. Use of an arteriovenous fistula or graft is preferred because these types of vascular access are associated with a lower risk of complications than dialysis using a catheter.

Living donor transplant rates rose under the KCC Model relative to the comparison group. Based on participant interviews, the deployment of additional care coordinator resources appeared to be the primary contributor to our observed findings. The model's impact on living donor transplants may be particularly beneficial given that this transplant type is associated with better long-term patient outcomes than deceased donor transplants.<sup>30</sup> This finding is notable given that achieving improvements in outcomes related to transplantation, another major model objective, can be challenging for model participants because there are substantial dependencies on external factors, such as organ availability and transplant center practices.

Although there was no statistically significant impact on Total Medicare Parts A & B payments, we found the KCC Model increased net Medicare spending during PY 2023, driven by incentive payments to KCC participants. Impactful changes to the care of patients under the KCC Model could result in long-term savings to Medicare, so it will be important to continue examining net impact on Medicare spending as the model progresses.

We examined patient-reported outcomes to help understand how both care delivery and treatment may affect experience with care, patient activation, and health-related quality of life. We did not find that KCC patients had worse care experiences than comparison patients and, in fact, identified some positive signals for patients in the model. Among patients with CKD, we found that a higher percentage of KCC patients reported receiving information about different dialysis modalities and transplants than comparison patients.

We also examined whether enhanced person-centered care and shared decision-making under the KCC Model improved patient activation. KCC patients reported that they took actions to better manage their own health care between their first and last Patient Activation Measure (PAM) survey overall and across subgroups. In interviews and site visits, we found that PAM surveys were generally perceived as having value but also somewhat burdensome to administer.

*"I think everybody fusses about the PAM and the PHQ-9s, but I truly think that it's eye opening to see the level of poor engagement and depression in some of these patients."*

*– KCF Participant*

The KCC Model is part of a broader effort to improve care for patients with kidney disease that includes other models with overlapping goals. The CMS Innovation Center's series of Medicare kidney-focused models includes the CEC Model, the mandatory ETC Model, and, the Increasing

<sup>30</sup> Lentine, K. L., Smith, J. M., Lyden, G. R., Miller, J. M., Dolan, T. G., Bradbrook, K., Larkin, L., Temple, K., Handarova, D. K., Weiss, S., Israni, A. K., & Snyder, J. J. (2024). OPTN/SRTR 2022 annual data report: Kidney. *American Journal Of Transplantation*, 24(2S1), S19–S118.

Organ Transplant Access (IOTA) Model, a mandatory, transplant hospital–based model that aims to increase access to kidney transplants, both deceased and living donor.

These models are building blocks along the disease life cycle, from CKD to transplantation. The findings in this report include encouraging signals that the efforts to date will result in meaningful change to the quality of care for patients throughout the course of kidney disease.

The next annual evaluation report will cover the third performance year (PY 2024), representing the midpoint of the KCC Model’s 6 years of operation. Given that even the newest cohort will be beyond its first performance year, the PY 2024 evaluation will provide an opportunity to assess how the model is maturing. As the model progresses, we will examine how the termination of the ETC Model on December 31, 2025, and KCC Model changes planned for PY 2026 affect the drivers of change and progress toward model goals.<sup>31</sup>

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<sup>31</sup> Centers for Medicare & Medicaid Services. (2025). *Kidney Care Choices Model Performance Year 2026 model update – quick reference*.  
<https://www.cms.gov/kidney-care-choices-model-performance-year-2026-model-update-quick-reference>