

Kidney Care Choices (KCC) Model Evaluation



Summary of Findings for the Second Performance Year, 2023



About the Authors

Submitted by:

The Lewin Group, in partnership with the University of Michigan Kidney Epidemiology and Cost Center

Brighita Negrusa, Project Director

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Authors:

Brighita Negrusa, Jennifer Wiens, Darin Ullman, Claudia Dahlerus,¹ Richard Hirth,¹ Kelsey Bacon, Alexander Johann, Annalise Maillet, Rachel Pinson, Nicholas Jones, Daniel Strubler, Betsy Vomacka, Mary Beth Schaefer, Savannah Lantz, Jonathan Segal,¹ Vahakn Shahinian,¹ Yi Li,¹ Tempie Shearon,¹ Valarie Ashby,¹ Tammie Nahra,¹ Joseph Gunden,¹ Mia Wang,¹ David Mosack,¹ Ashley Garcia¹

¹ University of Michigan Kidney Epidemiology and Cost Center

Prepared for:

Sarah Lewis, PhD, MSPH

Research and Rapid Cycle Evaluation Group (RREG),
Center for Medicare and Medicaid Innovation (CMMI),
Centers for Medicare & Medicaid Services (CMS)

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The evaluation team would also like to recognize contributions from additional team members: Daniel Gregory, Brian Mercer, Colin Jarvis, Madelyn Lensing, Micaela Brewington, Sararat Tosakoon, Kassandra Fate, John Ayanian,¹ Sandra Callard,¹ Yating Sun¹

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About this document

This report summarizes findings from the evaluation of the Kidney Care Choices (KCC) Model in 2023, the model's second performance year. It offers a high-level snapshot of evaluation results.

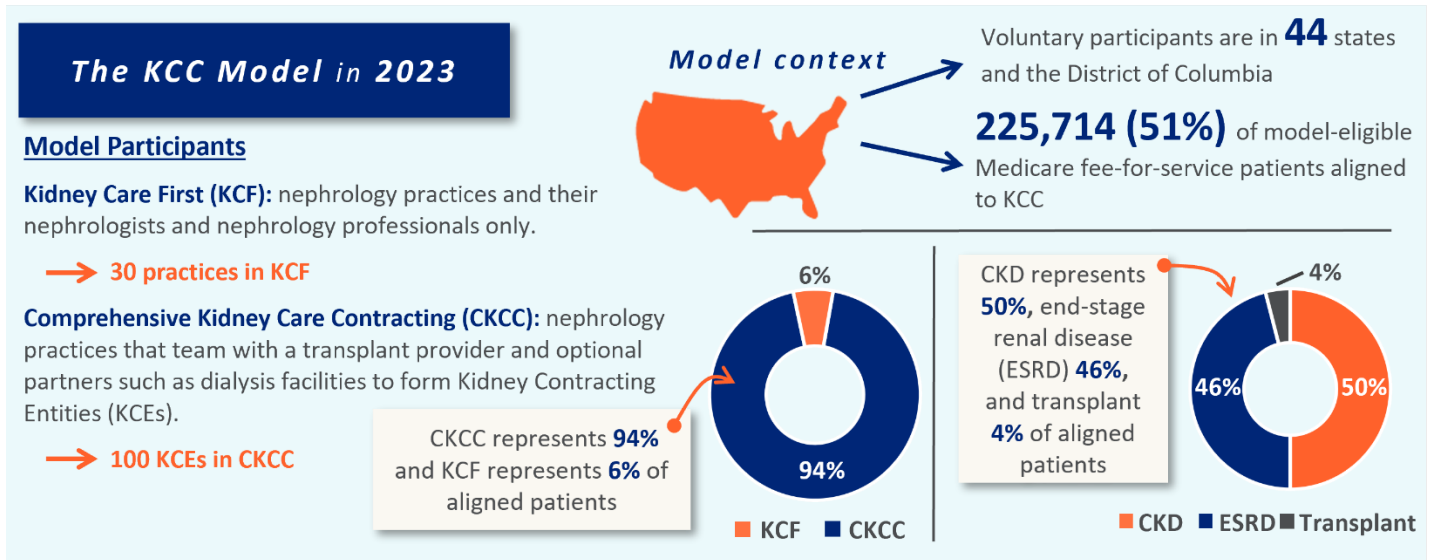
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The Kidney Care Choices Model aims to improve the quality and reduce the cost of care for patients with advanced kidney disease.



Report snapshot

The Kidney Care Choices (KCC) Model focuses on improving care throughout the kidney disease life cycle, from advanced chronic kidney disease (CKD) care to successful transplantation.



The KCC Model improved quality of care in its second performance year but resulted in an increase in net Medicare spending.

Improvements in quality of care in 2023 (impact relative to pre-KCC rates)

- Increased Optimal ESRD Starts by 31%
- Decreased hemodialysis catheter use, which is generally considered less safe, by 29%
- Increased preemptive waitlisting (that is, waitlisting prior to the start of dialysis), a potential precursor to preemptive transplants, by 40%
- Increased preemptive transplants by 69% and living donor transplants by 22%
- Increased the rates of home dialysis by 10% and decreased in-center dialysis use by 1%
- Increased home dialysis training, a necessary step before beginning home dialysis, by 22%

Payments and net spending impacts in 2023

- No statistically significant impacts on Total Medicare Parts A & B payments overall
- Increases in net Medicare program spending of \$304.8 million

KCC Model overview

Chronic kidney disease (CKD) is a life-changing diagnosis for patients and their families. By the time a person experiences CKD symptoms, the damage to kidney function is often irreversible.¹ In early disease stages, patients may need to significantly change their lifestyle to slow disease progression. In later stages, when kidneys fail, patients depend on dialysis treatments several times a week, with a small minority receiving kidney transplants.

Kidney disease poses a large and growing burden to the Medicare program. About a quarter of people with Traditional (fee-for-service) Medicare had a CKD diagnosis in 2020.² Care delivery for patients with CKD is also expensive and complex. As CKD progresses to more advanced stages, patients require treatment from multiple providers of different specialties who may work in siloes, potentially leading to fragmented care.³

The Centers for Medicare & Medicaid Services (CMS) launched the Kidney Care Choices (KCC) Model in 2022 to improve care for patients with advanced CKD and end-stage renal disease (ESRD) covered by Traditional Medicare.⁴ The KCC Model encourages providers to collaborate and improve care coordination for patients with advanced CKD and ESRD. Specifically, the KCC Model is designed to achieve the following key goals for patients with advanced CKD and ESRD:

- Delay the progression to kidney failure
- Increase the use of home dialysis
- Increase the number of kidney transplants
- Reduce the cost of care
- Improve the quality of care

KCC is a voluntary model where participants can choose from options with varying levels of financial risk. Nephrology (kidney care) professionals and their practices can participate on their own in the CMS Kidney Care First (KCF) model option, or they may team up with a transplant provider and other partners to join the Comprehensive Kidney Care Contracting (CKCC) model option. When nephrologists and nephrology practices opt to form Kidney Contracting Entities (KCEs) with a transplant provider under the CKCC model option, they can take on more financial risk by sharing in savings or losses for the total cost of care.

¹ Katella, K. (2024). *Why is chronic kidney disease (CKD) on the rise? 6 things to know*. Yale Medicine. <https://www.yalemedicine.org/news/why-is-chronic-kidney-disease-ckd-on-the-rise>

² Centers for Medicare & Medicaid Services. (2022). *Chronic kidney disease disparities in Medicare fee-for-service beneficiaries*. <https://www.cms.gov/files/document/data-snapshot-ckd-march-2022.pdf>

³ Taha, A., Iman, Y., Hingwala, J., Askin, N., Mysore, P., Rigatto, C., Bohm, C., Komenda, P., Tangri, N., & Collister, D. (2022). Patient navigators for CKD and kidney failure: A systematic review. *Kidney Medicine*, 4(10).

⁴ People with ESRD are eligible for Medicare at any age, and medical coverage continues for 3 years after a successful kidney transplant, with additional coverage for immunosuppressive drugs for the life of the kidney transplant (as of January 1, 2023), for patients who have not aged into Medicare coverage.

Participation options in the KCC Model

Nephrology professionals and their practices may choose to join the CMS **Kidney Care First (KCF)** option, which offers incentives such as a bonus for successful kidney transplants and a capitated payment for each patient with CKD to help manage their care. Nephrology practices that team up with a transplant provider, and other optional partners such as dialysis facilities or integrated kidney care organizations, can join the **Comprehensive Kidney Care Contracting (CKCC)** option. In the CKCC option, these teams of providers—called Kidney Contracting Entities (KCEs)—receive similar incentives to those in the KCF option, but they are also accountable for the total cost of care for their patients who are aligned to the model. This accountability allows participants to share in the savings or losses they generate for CMS.

In this report, we focus on combined effects of the two model options at the KCC Model level.

In 2023, 30 nephrology practices comprising 339 nephrology professionals participated in the KCF model option. The CKCC model option comprised 100 KCEs and 4,331 nephrology professionals, along with 229 transplant providers and 1,594 dialysis facilities. Across both model options, participation spanned 44 states and the District of Columbia, with higher concentrations of participants in the South and fewer in the Midwest. About 51% of model-eligible fee-for-service beneficiaries were aligned to the KCC Model in 2023.

KCC exists in a landscape that includes other models with overlapping goals. For example, CMS is testing another model focused on improving care for patients with ESRD. The ESRD Treatment Choices (ETC) Model is mandatory for dialysis facilities and certain managing nephrology clinicians in selected geographic areas. The ETC and KCC Models share some important goals of improving rates of home dialysis and increasing transplants, and their incentives may reinforce each other for patients aligned to both models. The ETC and KCC Models build on an earlier kidney care–focused model, the Comprehensive ESRD Care (CEC) Model, and experience in the CEC Model might influence provider participation and performance in the KCC Model. It is important to consider external factors like these, where feasible, in evaluating the KCC Model.

This report provides evaluation findings on how the KCC Model is changing care for patients with advanced CKD and ESRD, with a focus on the model’s second performance year (2023). We first describe the drivers of quality and payment impacts throughout the stages of CKD and then discuss impacts on payments and net costs to Medicare. We focus on statistically significant impacts at the KCC Model level and include views and experiences that participants shared in site visits and interviews.

The Lewin Group, an independent contractor, analyzed claims, survey, interview, and site visit data for this evaluation to determine whether the model achieved its primary goals.





In 2023, KCC Model participants shifted patients toward home dialysis, enhanced patient education about treatment choices, and improved transplant rates. There was no statistically significant impact on Total Medicare Parts A & B payments; however, the model resulted in increased net Medicare spending in 2023. KCC

Participant investments associated with the KCC Model's incentives may lead to impactful changes to the care of patients with kidney disease that result in long-term savings for this population by delaying disease progression, shifting patients toward home dialysis, and increasing transplants.



The KCC Model led to statistically significant changes in quality, utilization, and payments across the disease life cycle relative to pre-KCC rates.

The table below shows results for statistically significant impacts of the KCC Model among patients with CKD, patients with ESRD, and transplant recipients. For each outcome, we provide the point estimate and percent change relative to the pre-KCC mean and indicate favorability of the result.

Domain	Outcome	KCC Impact		
Chronic kidney disease 	Quarterly eGFR testing	1.2 pp	1.4%	◆
	Number of CKD QCP services provided by nephrology professionals	0.02	5.8%	◆
	Optimal ESRD Starts	12.4 pp	30.5%	◆
End-stage renal disease 	Home dialysis utilization	1.1 pp	9.9%	◆
	Peritoneal dialysis utilization	1.2 pp	13.7%	◆
	Home dialysis training	0.11 pp	22.1%	◆
	In-center dialysis utilization	-1.0 pp	-1.1%	◆
	Graft use	1.3 pp	6.0%	◆
	Hemodialysis catheter use	-2.6 pp	-28.5%	◆
Transplantation 	Preemptive waitlisting	3.0 pp	40.0%	◆
	Transplants per 1,000 patient-months	0.46	14.8%	◆
	Living donor transplants per 1,000 patient-months	0.15	22.1%	◆
	Preemptive transplants per 1,000 patient-months	1.7	69.3%	◆
Payments 	Total Part B payments	\$39	1.6%	●
	Evaluation and management payments	\$2	2.1%	●
	Total dialysis payments	\$26	0.9%	●
	Home dialysis payments	\$16	5.6%	◆
	Peritoneal dialysis payments	\$23	9.8%	◆
	Home hemodialysis payments	-\$13	-25.2%	●
	Institutional post-acute care payments	-\$10	-2.8%	●
	Home health payments	\$3	1.9%	●

Notes: This table includes KCC Model-level difference-in-differences (DiD) impact estimates that are significant at or below the 10% level, expressed as the point estimate and percent change relative to the pre-KCC mean. CKD = chronic kidney disease; eGFR = estimated glomerular filtration rate; ESRD = end-stage renal disease; KCC = Kidney Care Choices; pp = percentage point; QCP = Quarterly Capitation Payment.



Favorable change



Neutral

Drivers of impact

The KCC Model has several incentives to drive changes to achieve the model goals. We evaluated more than 50 measures, including those related to quality, cost, and utilization, as well as patient-reported outcomes.

How does the evaluation team measure KCC Model impacts?

To estimate KCC Model impacts relative to KCF and CKCC comparison groups, we used a difference-in-differences (DiD) approach. DiD is a statistical method that quantifies the impact of the model by comparing changes in risk-adjusted outcomes for KCC patients with changes in outcomes for similar patients in the comparison group, before (2017–2019) and after (2022) KCC implementation. For mortality and delayed progression outcome measures, we used survival analyses to estimate KCC Model impacts. This report summarizes impacts in the second year of the model (2023).



Quality looks different across the stages of CKD.

The KCC Model focuses on improving care for patients throughout the kidney disease life cycle, from CKD care to successful transplantation. The relevant measures of quality change as patients move along the continuum of kidney disease. How we consider and measure quality depends on where the patient is within the disease life cycle. For example:

- With CKD, the primary objective is to delay disease progression as much as possible.
- For those who do progress to ESRD, the primary objective shifts to facilitating an “Optimal ESRD Start,” which includes:
 - Starting home dialysis
 - Starting in-center dialysis with a preferred form of vascular access
 - Receiving a preemptive transplant (that is, before requiring dialysis)
- Finally, for all patients with ESRD, the primary objective shifts to how well the patient is cared for and the disease managed, including increasing the use of transplantation and home dialysis.

Chronic kidney disease Stage 4 and 5

CKD is diagnosed by a sustained reduction in kidney function (for longer than 3 months) and is most often caused by diabetes or high blood pressure. Other health conditions and certain social and environmental factors can also lead to the development of CKD or accelerate the decline in kidney function.⁵ CKD is a common chronic disease, affecting about 1 in 7 adults, or roughly 35.5 million people, in the United States, but as many

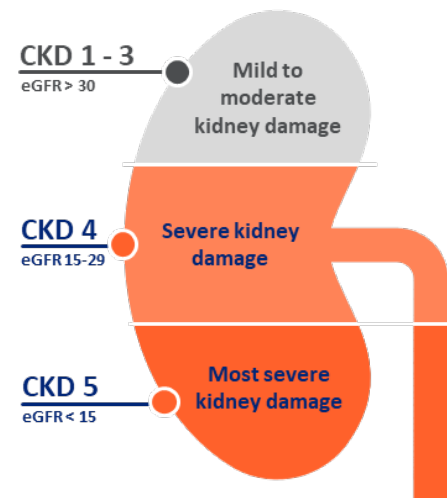
⁵ National Kidney Foundation. (n.d.). *Social determinants of health and chronic kidney disease*. <https://www.kidney.org/kidney-topics/social-determinants-health-and-chronic-kidney-disease>

as 9 in 10 people with mild to moderate CKD do not know that they have it. Among adults with advanced CKD and severe kidney damage, as many as 1 in 3 are not aware they have CKD at all.⁶ The KCC Model aims to offer coordinated, seamless care to patients with advanced CKD by providing interventions that effectively manage kidney disease to delay or prevent the onset of ESRD.



Activities to manage a patient's CKD and delay progression to ESRD improved under the model.

Kidney damage is categorized into one of five stages based on the estimated glomerular filtration rate (eGFR). Patients with advanced CKD, typically Stage 4 or 5, are at higher risk of progressing to ESRD and may experience other complications, such as high potassium in the blood, fluid overload, and heart disease. Providers may prescribe medications such as angiotensin-converting enzyme inhibitors (ACE inhibitors), angiotensin receptor blockers (ARBs), or sodium-glucose cotransporter-2 inhibitors (SGLT2 inhibitors) to help slow the progression of CKD. Once patients advance to Stage 5, they need to initiate dialysis at some point or receive a kidney transplant for survival.⁷ The advanced stages of CKD can present many challenges to patients, including physical symptoms and emotional stressors.



The KCC Model includes features designed to improve health and care coordination for patients with CKD Stages 4 and 5 and to delay progression to ESRD. Delayed progression is critical to patient health, as the 1-year rate of mortality increases by 21% from CKD Stage 4 to CKD Stage 5.⁸ CMS provides an up-front, per-patient (capitated) payment for investment in care coordination for patients in the model with CKD; this payment is called the CKD Quarterly Capitation Payment (QCP). The CKD QCP could contribute to increased staffing, patient outreach, and care innovation. Increased uptake of eGFR testing, SGLT2 medication use, and nephrology services can help ensure that a patient's CKD is well managed to try and slow progression. Additionally, educating patients about dialysis modality and transplant options before they reach ESRD may help them feel empowered and informed to select the modality choice that is right for them. The KCC Model also rewards providers who support patients in having an Optimal ESRD Start.

⁶ Centers for Disease Control and Prevention. (2024). *Chronic kidney disease in the United States, 2023*. <https://www.cdc.gov/kidney-disease/php/data-research/index.html>

⁷ National Kidney Foundation. (n.d.). *Stages of chronic kidney disease (CKD)*. <https://www.kidney.org/kidney-topics/stages-chronic-kidney-disease-ckd>

⁸ U.S. Renal Data System. (2024). *2024 USRDS annual data report: Epidemiology of kidney disease in the United States*. <https://usrds-adr.niddk.nih.gov/2024/chronic-kidney-disease/8-transition-of-care-in-chronic-kidney-disease>

Drivers in action: How does the model affect care for patients with CKD?

Multiple participants noted that they see patients more frequently under the KCC Model. In interviews with participants, some noted that they have added care processes such as **following up with patients** who skip visits, **enhancing medication management**, or **creating “triggers” for when patients with CKD should be referred** for vascular access or transplant planning.

Monitoring kidney function and connecting patients with CKD to nephrology care are important components of CKD management. Based on the DiD models for patients with CKD, **quarterly eGFR testing increased by 1%** over pre-KCC rates. Additionally, the number of **CKD QCP services provided by nephrologists per patient per month (PPPM) increased by 6%** over pre-KCC rates. These represent common outpatient and other care coordination services included in the CKD QCP paid to KCC participants.⁹ Overall, the KCC Model did not have a statistically significant impact on the use of SGLT2 inhibitor medication among patients with CKD who have diabetes; however, we found a modest 3 percentage point increase under the KCF model option, translating to about 211 more patients using this medication in 2023.

Given the high number of patients who are unaware that they have CKD, the model’s impact on connecting patients to needed nephrology care before they reach ESRD could be important for delaying disease progression. However, the KCC Model had no aggregate impact on delaying progression from CKD Stage 4 to ESRD.

The CKD Patient Experience Survey showed more favorable results for patients in KCC than the comparison group.

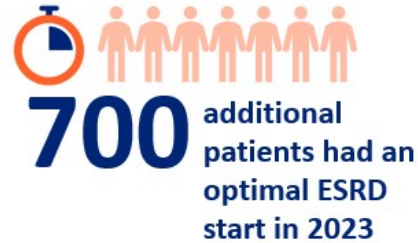
- A higher percentage of KCC patients with CKD reported receiving **information about dialysis modality and transplants** than comparison patients.
- About 30% of KCC patients with CKD surveyed (vs. 18% in the comparison group) indicated that the clinic “Always” provided **education about peritoneal dialysis** if they needed to start dialysis.
- A higher percentage of KCC patients with problems affording their medications said that providers gave them information on **services to help them pay for their medications**.

⁹ CKD QCP services are an aggregate measure of services provided by nephrology and non-nephrology professionals. Unlike under traditional fee-for-service, the CKD QCP gives nephrology professionals up-front, predictable payments aimed to assist in the care coordination of patients with CKD.



Optimal ESRD Starts increased under the KCC Model.

Receiving nephrology care and preparing for dialysis before the transition into ESRD can improve quality of care and outcomes for patients with CKD. By incentivizing Optimal ESRD Starts and delivery of appropriate nephrology care, the KCC Model encourages providers to offer timely interventions for patients with CKD. In the long term, these quality improvements may result in reduced morbidity, mortality, hospital admissions, and use of emergency department services,¹⁰ which could lead to lower costs to Medicare.



The rate of **Optimal ESRD Starts increased by 31%** over pre-KCC rates for the model overall, with a 26% increase in the KCF model option and a 31% increase in the CKCC model option.

Drivers in action: How does the model encourage Optimal ESRD Starts?

KCE participants 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.

There was also general agreement that of the three components of Optimal ESRD Starts, increasing the number of patients receiving a preemptive transplant was the most challenging.

“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

End-stage renal disease

In the final stage of CKD, known as end-stage renal disease (ESRD) or end-stage kidney disease, a person's kidneys can no longer function on their own. At this point, either chronic dialysis or a kidney transplant is necessary for survival.

Dialysis involves removing waste and excess fluid from the blood and keeping safe levels of minerals in the blood when a person's kidneys are no longer able to. Patients who need dialysis have options for where and

¹⁰ Crooks, P. W., Thomas, C. O., Compton-Phillips, A., Leith, W., Sundang, A., Zhou, Y. Y., & Radler, L. (2018). Clinical outcomes and healthcare use associated with optimal ESRD starts. *American Journal of Managed Care*, 24(10), e305–e311.

how they receive treatment. The time required to receive dialysis can be significant, and many factors, such as patient preference and dialysis modality availability, may influence a patient's modality selection. In the United States, in-center hemodialysis is by far the most common treatment modality.¹¹ However, home dialysis can offer more flexibility and independence than the more rigid schedule of in-center hemodialysis.

Types of dialysis

In-center hemodialysis (82% of all dialysis)

- Patients generally spend 3 to 4 hours at a facility three times per week.

Home dialysis (14% of all dialysis)

Home hemodialysis (2% of all dialysis)

- Short daily home hemodialysis involves five to seven treatments per week lasting about 2 to 3 hours each.
- Nocturnal home hemodialysis consists of slow overnight treatments up to 6 nights per week.

Home peritoneal dialysis (12% of all dialysis)

- Continuous ambulatory peritoneal dialysis requires 30 to 45 minutes per exchange and is typically done three to five times per day.
- Automated peritoneal dialysis uses a cycler machine to exchange solution and is done overnight.

In-center hemodialysis involves the removal of fluid and waste from the bloodstream using a hemodialyzer machine at a dialysis facility. The bloodstream is accessed through a fistula, graft, or catheter. Ideally, an arteriovenous fistula or graft is placed prior to a patient initiating hemodialysis, as this avoids the use of a catheter. Access through a fistula or graft is preferred over a catheter because they pose a lower risk of bloodstream infection. Accordingly, these are the types of vascular access included in the Optimal ESRD Starts measure. **Hemodialysis catheter use decreased by 29%** (1,607 fewer patients) and **graft use increased by 6%** (790 more patients) relative to pre-KCC rates.



Although home dialysis is growing in the United States, it is still underused by patients.

Home dialysis use grew steadily in the United States from 2012 to 2022, increasing from 9% to 14% among new patients with ESRD.¹² However, in countries where home dialysis is most prevalent, patients who dialyze at

¹¹ U.S. Renal Data System. (2024). 2024 *USRDS annual data report: Epidemiology of kidney disease in the United States*. <https://usrds-adr.niddk.nih.gov/2024/end-stage-renal-disease/2-home-dialysis>

¹² U.S. Renal Data System. (2024). 2024 *USRDS annual data report: Epidemiology of kidney disease in the United States*. <https://usrds-adr.niddk.nih.gov/2024/end-stage-renal-disease/2-home-dialysis>

home account for more than 30% of patients on dialysis.¹³ This gap suggests there is still room for growth in use of this modality in the United States.

Several factors may be limiting faster growth in the adoption of home dialysis. For example, during the coronavirus disease 2019 (COVID-19) pandemic, changes in economic and workforce conditions may have constrained expansion of home dialysis, even though home dialysis might have been appealing to patients to avoid potential exposure in a dialysis center.¹⁴ Medicare payment policies, absent the KCC Model, also may create a bias toward in-center dialysis by providing potentially higher physician reimbursement for this modality than for home dialysis. In addition, gaps in patient education about modality options may have played a role in slowing home dialysis growth. A key theme that the evaluation team heard in a discussion with an advisory group of patients with CKD and ESRD was the gaps in patient education and selection.



The KCC Model increased home dialysis use and lowered in-center dialysis use among patients with ESRD.

Multiple aspects of the KCC Model's design are intended to increase the use of home dialysis. The model provides financial incentives to achieve this goal through the Home Dialysis True-Up, which reduces the financial bias toward in-center dialysis by increasing nephrologist payments for managing home dialysis patients. The model's CKD QCP also 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 is another model feature that provides financial incentives to allow more types of providers to deliver (dietitians, registered nurses, licensed clinical social workers), and an expanded pool of patients to receive (CKD Stage 5 and first 6 months of ESRD), kidney disease education services.



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



The model's Optimal ESRD Starts quality measure rewards participants when new patients start dialysis on a home dialysis modality. Further, the participation structure of the model could help drive increases in home dialysis; because KCC is a voluntary model, the providers who opt to participate may be more motivated to change their approach to care delivery.

¹³ Briggs, V., Davies, S., & Wilkie, M. (2019). International variations in peritoneal dialysis utilization and implications for practice. *American Journal of Kidney Diseases*, 74(1), 101–110.

¹⁴ U.S. Renal Data System. (2024). *2024 USRDS annual data report: Epidemiology of kidney disease in the United States*. <https://usrds-adr.niddk.nih.gov/2024/end-stage-renal-disease/2-home-dialysis>

Drivers in action: How does the model encourage use of home dialysis?

Model participants reported investing in and providing enhanced modality education. For example, clinic staff or care coordinators provided dialysis and transplant education using a combination of in-person classes and follow-up appointments.

Several KCEs relied on their integrated kidney care organization partners to do follow-up modality education after patients' initial education sessions. Other model participants used the existing modality education program provided by their large dialysis organization partner.



Rates of home dialysis utilization increased for patients with ESRD in the KCC group and the comparison groups over time.¹⁵ Based on DiD analyses of patients with ESRD, in 2023, the KCC Model **increased use of home dialysis by 10%** and **decreased use of in-center dialysis by 1%** relative to pre-KCC use. These changes correspond to an increase of about 800 patients receiving home dialysis and a decrease of about 760 patients receiving in-center dialysis in 2023.

“ 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

Growth in home dialysis was driven by an **increase of 14% in peritoneal dialysis**. This finding is consistent with model participants' reports of investing in and providing enhanced modality education, and as noted above, a higher percentage of patients with CKD in the KCC Model reported receiving information about peritoneal dialysis relative to those in the comparison group.

CMS measures a patient's “activation,” or ability and confidence to manage their health and health care, using the Patient Activation Measure (PAM), which is one of the quality measures tied to model payments. Participant accountability for performance on the PAM quality measure may have contributed to improvements in home dialysis use if more activated patients are better equipped for managing home dialysis.

¹⁵ The KCC group increased an average of 5.3 percentage points, and the comparison group increased 4.3 percentage points from the evaluation baseline (2017–2019) to 2023.



The KCC Model led to growth in home dialysis training, a key step for patients with ESRD to be able to dialyze at home.

In 2023, the KCC Model **increased use of home dialysis training by 0.1 percentage points, or 22%**, above pre-KCC levels. In other words, about 371 more patients received home dialysis training under the model relative to patients in the comparison group.

Patients can complete training for peritoneal dialysis in about a week, while home hemodialysis training typically takes 4 to 6 weeks, so average monthly uptake and estimated changes in use may appear low. However, the change is a meaningful signal that KCC providers are increasing the share of patients in a given month who are training for home dialysis.



Total dialysis payments grew under the KCC Model, driven by increases in home dialysis, specifically peritoneal dialysis.

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. The KCC Model led to **increases in total dialysis payments of \$26 PPM, or 0.9% over pre-KCC rates**, and **peritoneal dialysis payments of \$23 PPM, or 10%**. These payment results align with increases in home dialysis use. While we may expect to see a reduction for in-center dialysis payments given the decline estimated for in-center dialysis use, we did not find a statistically significant change in payments. This may be the result of an offsetting increase in payments due to fewer missed treatments.

Transplantation

Kidney transplantation is the optimal treatment for many people with ESRD. Patients with ESRD can receive either a deceased or a living donor kidney transplant. Registration on the waitlist is a required step before deceased donor 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 criteria for a kidney transplant. While on the waitlist, patients may be in either active or inactive status. Maintaining active status is crucial, as it means patients are ready for immediate transplantation if an organ becomes available. To maintain active status, a patient must continue to meet certain eligibility criteria, such as health status, medication adherence, and required blood work. In 2023, there were about 28,000 kidney transplants in the United States, with more than 6,000 transplanted from

living donors.¹⁶ In that same period, about 94,000 people were on the transplant waitlist, 49,000 of whom had active status.

Drivers in action: How does the model encourage kidney transplants?

Several KCE physicians reported having an existing relationship with their partner transplant hospital. They felt this relationship helped with communication between the transplant centers and nephrologists. In interviews, KCE participants noted that their formal transplant partner (nephrologist or surgeon) was actively engaged.

Some participants also reported investing in creating new transplant coordinator or patient navigator roles to support patients through the evaluation process.

“The nurses from CKCC help [with] the process of patient listing and keeping the patient active on the transplant list. And after the transplant, they help sometimes with the social worker, too, and they have a dietitian. So they have [helped] on both ends of the transplants ... they [are] additional resources.”

– KCE Physician

Based on DiD analyses of patients eligible for a transplant,¹⁷ the KCF model option increased the percentage of patients on the transplant waitlist with active status by 39% relative to the pre-KCC mean, or about 101 patients. For KCC overall, the percentage of **patients preemptively waitlisted increased by 40%** relative to the pre-KCC mean, or about 128 patients. Preemptive waitlisting reflects waitlisting that occurs prior to the start of dialysis, allowing potential for earlier transplantation, including preemptive transplantation.

“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

The increased number of patients on waitlists corresponds to an increase in kidney transplants. Specifically, the KCC Model led to an **increase in living donor transplants of 0.2 transplants per 1,000 patient-months**, or 72 patients. KCC also **increased the number of preemptive transplants by 2 transplants per 1,000 patient-months**,

¹⁶ Organ Procurement & Transplantation Network. (2023). *National data*. <https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/>

¹⁷ 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.

which equates to about 69 patients. Collectively, this growth led to an **increase in total transplants of 0.5 transplants per 1,000 patient-months** for KCC patients, translating to about 215 patients.

In 2023,



Although not directly incentivized by the model, transplant waitlisting is a required step prior to transplantation. Thus, the model's incentives to increase kidney transplantation may have contributed not only to the increase in transplants but also to the increase in patients with preemptive waitlisting, or an increase in waitlisting with active status.

“ We did have a patient that was transplanted back in April, who, when I [care coordinator] came to the program, thought she was active [on the waitlist]. She wasn't. And we got that taken care of to get the ball rolling. ”

– KCF Care Coordinator

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 2023, more significant changes in these outcomes might take time to emerge.

Continuum of kidney disease stages

In addition to disease stage-specific outcomes, we evaluated outcomes that span the continuum of disease stages covered by the KCC Model. We measured patients' use of more urgent, intensive, or costly services because decreases in such services could reflect better care coordination. We also used patient surveys to understand whether KCC patient “activation”—or their ability to manage their health and health care—and patient quality of life are improving under the model. Some of the payment outcomes also reflect the use of services by all patients in the model. These include payments for patient evaluation and management services and post-acute care. All these outcomes can provide insights into the quality of care delivered to patients under the KCC Model.



Overall, the KCC Model did not affect the proportion of patients with an acute care hospitalization, readmission, or emergency department visit.

Avoiding preventable use of costly hospitalizations through better care coordination could help lower Medicare expenditures and improve quality of life for patients across disease stages. In the CEC Model, the predecessor

to the ETC and KCC Models, decreases in hospitalizations and readmissions among patients with ESRD were a primary driver of payment reductions.¹⁸ CEC exclusively focused on patients with ESRD. Therefore, it might take more time to see similar payment reductions in KCC, which includes a larger, more varied population.

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, could motivate providers to invest in new staff or other resources to improve care coordination and prevent hospitalizations.

“ 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

Based on DiD analyses, the KCC Model **did not affect the proportion of patients with an acute care hospitalization, readmission, or emergency department visit** in a given month in 2023. In general, reducing hospitalizations and emergency department visits for patients with kidney disease may be challenging because of their multiple comorbidities and the complexity of their care needs. Participants reported holding interdisciplinary team meetings to discuss patients with high risk of hospitalization and conducting medication reconciliation after a hospitalization to prevent readmission. Some participants reported that hospitalization outcomes are hard to move in the short run.

How did the KCC Model affect survival?

A key consideration of the model's ultimate success is its effect on mortality. Patients with kidney disease have a higher mortality rate than the general U.S. population, which worsened during the COVID-19 pandemic.¹⁹ The KCC Model aims to reduce mortality through increased kidney transplants and better care coordination.

The KCC Model did not have an impact on all-cause mortality in 2023.

¹⁸ 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>

¹⁹ U.S. Renal Data System. (2024). *2024 USRDS annual data report: Epidemiology of kidney disease in the United States*. <https://usrds-adr.niddk.nih.gov/2024/end-stage-renal-disease/2-home-dialysis>



Patient quality of life and patient activation surveys showed favorable results for KCC patients.

Patient-reported outcomes are important for understanding KCC patients' care experiences, quality of life, and activation. For instance, KCC patients could have better experiences than patients not aligned to the model due to providers' enhanced focus on education and care coordination. For the KCC Model evaluation, we examined patient-reported outcomes to complement the clinical quality of care and utilization outcomes.

Patient quality of life was favorable for KCC patients in four topic areas, including mental health.

Based on a quality of life survey fielded to KCC participant and comparison group patients with CKD Stage 4, CKD Stage 5, ESRD, or a kidney transplant, patient-reported quality of life for anxiety, depression, pain interference, and pain intensity was slightly favorable for KCC patients, but overall, these differences between the KCC and comparison group were small and not clinically meaningful.

Under the KCC Model, improved communication about treatment options could mean that more patients are choosing a treatment modality that better aligns with their lifestyle and preferences. Better disease management could also facilitate treatment of symptoms related to physical function, depression, pain, and fatigue. As expected, KCC patients reported better quality of life than patients who are not in the model, but differences were not clinically meaningful.

CMS measures patient activation using the PAM survey and holds participants financially accountable for this quality measure. This accountability for performance on the PAM quality measure could help motivate providers to improve patient education, engagement, and shared decision-making. Patient activation increased across patients in all stages of the disease life cycle.

The PAM survey showed increased patient activation among KCC patients.

The average score for KCC survey participants from the first to the last PAM survey increased by 8 points and increased most among transplant patients.

Although these results are encouraging, we cannot attribute the increases in PAM scores to the model because we do not have patients' PAM scores from before the model began or from a comparison group as points of reference.



Payments varied for services used by KCC patients across disease stages.

Payments for evaluation and management visits are a small part of the total cost of care for patients with advanced kidney disease. While increased patient-centered care could result in greater use of evaluation and management visits, providers participating in shared savings options under CKCC may minimize these visits to lower the total cost of care. **Payments for evaluation and management visits increased by \$2 PPM** under the

KCC Model. Providers may be increasing evaluation and management visits to improve their oversight of patient care and avoid higher-cost complications in the future. This increase parallels improvements in quality measures noted in 2023. It will be important to continue monitoring quality measures to assess the impact of increased clinical touches on quality outcomes.

The model could also lead to decreases in payments for post-acute care by reducing post-acute care use or shifting patients toward lower-cost post-acute care options. **Payments for institutional post-acute care**, such as care in a skilled nursing facility, **decreased under the model by \$10 PPM** in 2023.

Patients with CKD and ESRD are complex, and patient needs vary in different stages of kidney disease. While care may look different as kidney disease progresses, ongoing support, accessible patient education, and comprehensive clinical oversight are important for the health and quality of life of patients with CKD and ESRD throughout the continuum of their care. Given the burden that kidney disease, dialysis, and the transplant process places on patients, patient quality of life and activation are important indicators of effects of the model on patients. Choices about dialysis and transplantation are highly personal and affect patients' daily lives, and reports of favorable quality of life scores in the KCC Model signal that patients are engaged in their care and feel empowered to make decisions that are right for them.

As patients shift away from in-center to home dialysis, the frequency of in-person contact with their care team decreases. The KCC Model did not increase the proportion of patients with acute care hospitalizations, readmissions, or emergency department visits, even with significant shifts to home dialysis. These findings may signal that the patient-centered focus of the model resulted in more thorough clinical management of patients with kidney disease. In the long term, this increased care coordination may result in significant decreases in the use of expensive emergency or inpatient care, leading to reduced costs to Medicare.

Impacts on payments and net spending

In its second year, the KCC Model did not lead to a statistically significant gross change in Total Medicare Parts A & B payments but did result in a statistically significant increase in net Medicare spending.

Payments

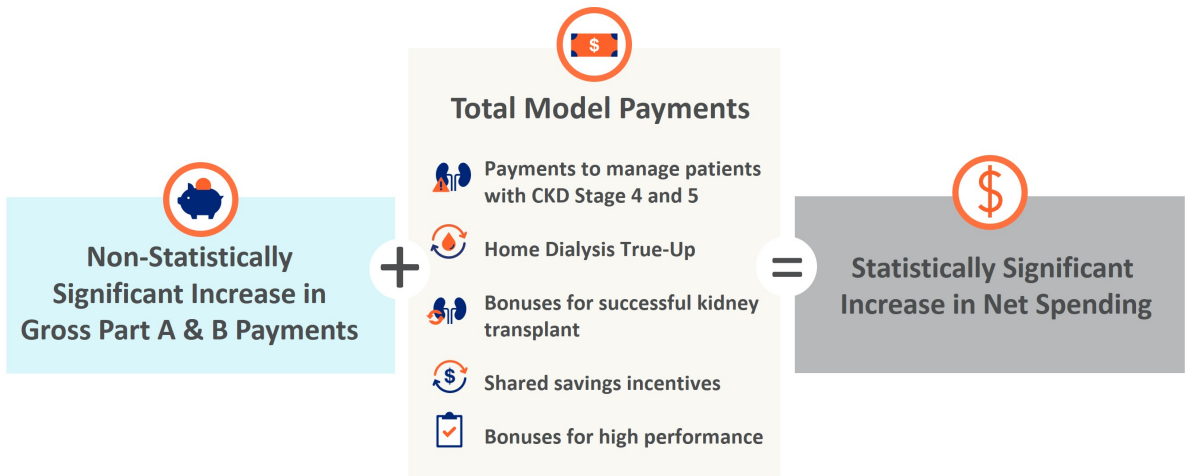
In our DiD analyses, we estimated an increase of \$52 PPM in Medicare Part A and B spending that was not statistically significant at the 10% level. KCF and CKCC had **no statistically significant impact on Total Part A payments**, but there was some movement within Total Part B payments and the subcomponents of Part A and B payments.

In terms of Part A payments, KCC **decreased payments for institutional post-acute care services by \$10 PPM and decreased payments for home health services by \$3 PPM** relative to the comparison group. Despite these changes, there was no impact on Total Part A payments in 2023.

Increases in Part B payments of \$39 PPM for KCC patients relative to comparison group patients corresponded to KCC impacts on dialysis modality and largely aligned with overall model goals. While payments for both forms of home dialysis increased from the pre-KCC period to 2023, home hemodialysis payments for KCC patients increased at a lower rate than for comparison group patients. Conversely, home peritoneal dialysis payments for KCC patients increased at a higher rate than for comparison group patients.

Specifically, **home hemodialysis payments** for KCC patients **increased by \$13 PPM less** than for comparison group patients, and **home peritoneal dialysis payments increased by \$23 PPM more** than for comparison group patients. In total, **home dialysis payments increased \$16 PPM**, and **all dialysis payments increased \$26 PPM** under the KCC Model. This high rate of peritoneal dialysis use could signal patient preference for the increased flexibility and shorter training that peritoneal dialysis offers over home hemodialysis.

Net spending



In 2023, we found a non-statistically significant increase in gross payments, calculated from the estimated change in total payments PPM multiplied by patient-months. However, combining this estimate with the payments made for model incentives resulted in a statistically significant increase in net spending to Medicare.

The model contributed to an **estimated increase in net spending to Medicare of \$304.8 million in 2023**, driven by **an estimated increase in net spending of \$275.4 million** in the CKCC model option. These increases stem from estimated increases in Part B payments, as well as incentive payments allocated to KCC participants.

The KCC Model improved quality of care but increased net Medicare spending.



Progress toward model goals

In its second performance year, the KCC Model showed promising signs of increasing quality of care across the stages of CKD. Specifically, participants have made measurable progress on some of the model's stated goals, which include reducing in-center dialysis use and increasing the number of kidney transplants. Although the KCC Model is improving patient care and education, it has not resulted in Medicare savings to date and increased net Medicare spending in 2023.

The KCC Model did not achieve savings to Medicare in 2023.

Long-term Medicare program savings, while maintaining or improving quality, is a goal for CMS. Shifts to home dialysis have been associated with increased up-front costs that decrease over time compared with in-center dialysis.²⁰ Additionally, transplants represent a large, short-run cost to Medicare with long-run benefits. An increase in kidney transplantation under the model will lead to an increase in total payments due to the cost of the surgery and follow-up care in the initial months or years after the transplant. The gains to Medicare materialize in the years following the transplant, when the patient has fully recovered and is no longer on costly maintenance dialysis.

Finally, large incentive payments made to participants, such as shared savings payments, high performers pool payments, and the CKD QCP, may not have large, immediate impacts on total payments or specific payment categories. They may yield some short-term gains, as evidenced by the reduction in post-acute care facility and home health payments, or some costs, like the modest increase in evaluation and management payments. However, they also could result in larger gains to Medicare in the long run, once participants have established the appropriate structure of care for these patients. It will be important to monitor these costs as the model matures to understand how KCC performance corresponds to Medicare net spending impacts.

Quality of care improved for several measures.

KCC demonstrates the ability to affect outcomes for patients at earlier stages of the kidney disease journey. While many of the primary goals of the model aim to address outcomes associated with ESRD, KCC participants can engage in efforts that help patients with advanced CKD slow progression to ESRD, as well as better prepare patients for initiating kidney replacement treatment so that they have an "Optimal" ESRD Start. These efforts include increasing internal staffing to facilitate greater outreach, providing more and enhanced education, and collaborating with external providers to enhance the care continuum. The KCC Model did not have an aggregate impact on slowing disease progression for the CKD population. However, we did find an increase in

²⁰ Walker, R., Marshall, M. R., Morton, R. L., McFarlane, P., & Howard, K. (2014). The cost-effectiveness of contemporary home haemodialysis modalities compared with facility haemodialysis: A systematic review of full economic evaluations. *Nephrology (Carlton, Vic.)*, 19(8), 459–470.

Optimal ESRD Starts, gains in preemptive waitlisting and transplantation, and increases in eGFR testing and the number of CKD QCP services, perhaps indicating more physician involvement.

Providers made meaningful progress toward other model goals for the ESRD and transplant populations. The model includes financial incentives to foster growth in home dialysis use, such as performance adjustments that encourage providers to ensure their patients are informed about their dialysis options and prepared to start dialysis when they advance to ESRD. As a result, the model achieved its goal of increased home dialysis use, driven by peritoneal dialysis. As peritoneal dialysis increases, other important quality indicators, such as patient quality of life, may continue to improve. Similarly, with multiple incentives around increased transplantation, including the kidney transplant bonus, the Optimal ESRD Starts quality measure, and shared savings, the model led to increased transplants, which was likely a function of waitlisting efforts.

Conclusion

The KCC Model is part of a larger effort to improve care for patients with kidney disease. The CMS Innovation Center's series of Medicare kidney-focused models includes CEC, which centered on enhancing care for patients with ESRD, with dialysis facilities voluntarily forming Accountable Care Organizations. The mandatory ETC Model builds on CEC and incentivizes home dialysis, transplant waitlisting, and living donor transplants. Concurrently, the voluntary KCC Model expands on ETC in both the patient population served—by including patients with advanced CKD, ESRD, and transplant recipients—and the types of providers included—by requiring at least one transplant provider to participate in each CKCC KCE.

Looking ahead, the Innovation Center is continuing its focus on improving care and treatment for kidney disease by announcing the Increasing Organ Transplant Access (IOTA) Model, a mandatory, transplant hospital-based model that aims to increase access to kidney transplants, both deceased and living donor. IOTA also has the potential to reduce spending on ESRD care, as the amount Medicare pays for patients with a kidney transplant is substantially lower over time than the annual costs for in-center and home dialysis.

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.

