The federal government’s action to provide financial support for dialysis is arguably one of its most successful disease-specific investments. Since passage of the Medicare ESRD Act in 1972, dialytic therapies have extended life for millions of patients with kidney failure by an average of 5 years. Initially estimated to annually treat about 10,000 patients with few comorbidities, the program has grown to support nearly 500,000 individuals with maintenance dialysis (1).

During this time of growth, the care of these individuals has also become complex, costly, and often uncoordinated. Along with increasingly common comorbidities such as diabetes mellitus, hypertension, and cardiovascular disease, patients typically receive dialysis treatment at an outpatient facility or at home for between 3 and 7 days per week. Given their high burden of disease, patients with ESRD experience high hospitalization rates and have 59% mortality within 5 years after onset of ESRD (1).

Perhaps in response, the Centers for Medicare and Medicaid Services (CMS) have slowly guided the ESRD program toward models that have come to be known as value-based care with the twin goals of better health for individuals and lower costs. In a time-limited program from the late 1990s to the early 2000s, providers received capitated payments for the total cost of care (dialysis services, medications, hospital care, and other specialists) for patients with kidney failure receiving dialysis in selected markets (2). Lessons from this experiment likely informed subsequent legislation expanding bundled dialysis composite payments linked to performance metrics and patient experience (surveys) starting in 2011. Yet services and medications outside of maintenance dialysis, have remained under traditional fee-for-service and constitute a large percentage of overall costs (1).

In 2016, CMS launched the Comprehensive ESRD Care (CEC) program (3), a major step forward toward value-based care. Nephrologists and dialysis organizations organized into ESRD Seamless Care Organizations (ESCO) that were considered Accountable Care Organizations for dialysis patients. The CEC program was revolutionary for several reasons. It represented the first time that participating nephrologists and dialysis organizations jointly managed both dialysis and nondialysis care. Staff in CEC clinics also assessed new, patient-focused measures such as depression and falls risk. Additionally, ESCOs, incentivized to provide coordinated care with hospitals and other non-nephrologist providers via performance metrics, made investments in care management resources and information technology. Finally, both nephrologists and dialysis providers were responsible for the total cost of care of their group of patients. Because the CEC program adopted a two-sided financial risk approach, providers could participate in any shared savings while being responsible for losses. At its peak, the CEC program counted 37 ESCOs with three large dialysis organizations and four other dialysis organizations and included 12% of all dialysis facilities nationally (4).

The CEC program attained at least one goal of value-based care: better health for individuals. Patients aligned to ESCOs had higher rates of preventative services (e.g., dilated eye exams, lipid screening), optimal dialysis (e.g., less frequent dialysis catheter use), and a reduction in hospitalizations compared with patients not aligned to ESCOs (4). Attainment of the second goal of value-based care, reduced costs, was nuanced. During its first 2 years, the CEC model resulted in a $68 million reduction in spending; yet, after accounting for shared savings ($114 million), there was a net loss for the CMS (5). By the time of the most recent financial analysis, CEC-aligned beneficiaries had a significant reduction in Parts A and B Medicare compared with traditional fee-for-service beneficiaries; however, total Part D drug costs increased among CEC beneficiaries relative to traditional fee-for-service beneficiaries (4).

Hirth and co-authors have now published new results from the CEC program (6). Motivated to understand the drivers of improvements in the number of maintenance dialysis sessions, they investigated the effect of CEC clinics on dialysis treatment adherence. The study defined adherence as attending as-scheduled treatments and attending rescheduled treatments that were missed for reasons other than hospitalizations. The study included data from the CEC program, 2014–2019, and used a difference-in-difference approach to examine
adherence differences over time between patients who were treated at CEC-aligned or non-CEC-aligned clinics: 1037 CEC facilities were propensity score matched one-to-one with non-CEC facilities (original n=3931) that were deemed eligible comparator facilities. After matching on facility, the authors analyzed facility-clustered data at the patient level, comparing 338,334 CEC-aligned patients versus 277,342 patients who were not aligned with CEC facilities, and controlling in bimodal regression models for additional patient-level covariates.

The authors’ first key finding from this study was that patients at CEC-aligned facilities had a marginally higher odds of attending all as-scheduled treatments over time (odds ratio [OR]=1.02). To disentangle statistical significance from clinical/policy relevance, we translated a few of the odds and OR estimates to absolute probabilities and differences (probability=[odds]/[1+odds]). Using information from table 2 to transform the baseline odds (exp[1.088]=2.97) and difference-in-difference OR (1.018) into probabilities of attending all as-scheduled treatments, the observed difference in probabilities was approximately 0.3% (75.1% for CEC-aligned patients versus 74.8% for non-CEC aligned patients). Additionally, the authors found that the CEC group had higher odds of rescheduled treatments over time (OR=1.09). Using information from table 4 and the same conversion approach, the observed difference in probability of rescheduled treatments was approximately 0.1% (9.6% for CEC-aligned patients versus 9.5% for non-CEC-aligned patients).

As the authors state, certain patient characteristics may modify the potential effects of CEC alignment on treatment adherence. Although the effect of CEC on rescheduled treatments differed between patients aged <70 years (OR=1.12) versus those aged ≥70 years (OR=0.99; P value for homogeneity=0.005) (7), the clinical/policy importance of this heterogeneity may be minimal, given the small absolute magnitude of the difference in probabilities between CEC groups in probabilities between CEC groups. Future analyses on care coordination strategies should follow their example to conduct subgroup analyses assessing potential heterogeneity of effects—as the authors did for sex and age group in their study—especially when working with large databases. For example, such analyses among dually eligible individuals or nursing home residents might clarify opportunities for deploying impactful interventions to well-defined targeted populations.

Several other aspects of this study stand out, and could inform the next generation of programs, policy, and clinical practice in kidney care. First, the authors should be commended for investigating adherence, a common and begging issue for researchers, patients, and providers alike, because there is no “one-size-fits-all” consensus on a definition for this nuanced concept. Methodologically, the authors implemented a clearly defined claims-based approach to identify scheduled patterns of dialysis that could be used in future studies and improved by validating the definition with chart review. Further refinement of the definition of adherence could also incorporate other components of the dialysis prescription, including compliance with the prescribed time and diet, limiting fluid intake, and regular medication (dialysis and nondialysis) use. Finally, adding patients’ perceptions of treatment flexibility—important given the overall burden of disease for maintenance dialysis—would improve the definition. Assessing all of these elements of adherence would enhance future studies by providing a holistic picture of the patient experience and improve future care models.

Second, patients who are dually eligible for Medicare and Medicaid likely need additional support—beyond the infrastructure already built into the CEC program—such as transportation waivers/vouchers. “Duals” constitute about 20% of the total Medicare population. The study found that they may be less adherent to dialysis treatment than others, although these estimates lack the necessary clarity of interpretation (8) and would have been better addressed in subgroup analyses. For the dually eligible group of patients, other social determinants of health (e.g., food security, housing security) may have a significant influence on adherence. The CEC program did not include specific measures related to health care equity or disparities despite its novel approach. Policy makers should consider innovative approaches to address these other components in the next iterations of kidney care models, as demonstrated by the novel Health Equity Incentive aimed at dually eligible patients in the ESRD Treatment Choices (ETC) model (9). For dually eligible patients, the ETC model will promote home dialysis, a key performance metric, by incentivizing providers directly.

Third, the CEC program incentivized clinics to build the infrastructure to extend availability of treatments for patients past usual hours, reinforcing patients’ perceptions and opportunity for greater flexibility to remain adherent. Yet, these improvements appeared small. Notably, participating dialysis centers in the CEC program tended to be large and located in urban settings compared with traditional fee-for-service centers. Thus, these centers were likely able to accommodate extra treatments because of availability of space and staff, and the proximity of patients. Patients living in rural settings may not have the same opportunity for extra treatments when they must travel long distances after hours with limited county level resources such as after-hours transportation assistance; rural clinics may also have a smaller pool of available staff relative to urban clinics. Addressing the rural/urban resource divide will be a necessary step for future models.

As the next generation of kidney care models are considered, we hope CEC informs policy makers to develop equitable, value-based care plans for a medically complex group of patients.

Disclosures
A.V. Kshirsagar reports consultancy for Alkahest, Rockwell, and Target RWE; patents or royalties from UpToDate (contributor); and an advisory or leadership role on the editorial boards of the American Journal of Kidney Disease and Kidney Medicine. The remaining author has nothing to disclose.

Funding
None.

Acknowledgments
The content of this article reflects the personal experience and views of the authors and should not be considered medical advice or recommendation. The content does not reflect the
views or opinions of the American Society of Nephrology (ASN) or Kidney360. Responsibility for the information and views expressed herein lies entirely with the authors.

Author Contributions
A.C. Kinlaw provided major edits and reviewed the manuscript; and A.V. Kshirsagar was responsible for conceptualization and wrote the original draft of the manuscript.

References

Received: January 26, 2022 Accepted: May 3, 2022
See related article, “Association of the Comprehensive ESRD Care Model with Treatment Adherence,” on pages 1039–1046.