

Home Dialysis in the United States: To Increase Utilization, Address Disparities

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The 2019 Advancing American Kidney Health Initiative proposed to increase the number of US patients with kidney failure treated at home, whether by peritoneal dialysis (PD) or home hemodialysis.¹ As of 2017, only

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10.8% of US incident and only 11.8% of prevalent dialysis patients dialyzed at home.² Although this represents a >30% increase during the past decade, home dialysis use remains lower than in many other developed economies.² Despite little agreement in the United States as to how many patients should dialyze at home, most members of the kidney community acknowledge that home dialysis rates could increase substantially without reducing patient choice.

In the recently proposed End-Stage Renal Disease (ESRD) Treatment Choices (ETC) Model, the Centers for Medicare & Medicaid Services (CMS) set the goal that 80% of incident dialysis patients should be treated by home dialysis or preemptive transplantation.³ This contrasts dramatically with current use: <14% of incident patients are currently treated by home dialysis or preemptive transplantation, and only 38% of prevalent patients dialyze at home or undergo transplantation.

This very ambitious goal focuses our attention on the barriers to home dialysis and preemptive transplantation. Barriers to home dialysis include unstable living situations and limited space for storage, poor health literacy, and limited family support,^{4,5} circumstances that are more common among individuals with lower socioeconomic status. In proposing the ETC model, CMS struggled with these disparities, stating: “We also considered excluding beneficiaries with housing insecurity from attribution for the purposes of calculating the home dialysis rate, but could not find an objective way to measure housing instability.”³

In this issue of *Kidney Medicine*, Shen et al⁶ explore the association between socioeconomic status and dialysis initiation at home, focusing on PD as the dominant home therapy in the United States. They match US Renal Data System incident dialysis data to zip code–level socioeconomic factors in the American Community Survey and explore differences among non-Hispanic white, Hispanic white, non-Hispanic black, and Asian patients in the use of home dialysis as compared with in-center hemodialysis. Sensitivity analyses evaluate day 90 modality to account for early transition either to or from home dialysis. Many more black (36%) and Hispanic (38%) than white (29%) patients had not seen a nephrologist before dialysis

initiation. Among black patients, 11% were uninsured at dialysis initiation, and, among Hispanic patients, 13% were uninsured, compared with only 4% among white patients. Black and Hispanic patients also more often resided in regions where poverty was more common and high school graduation rates were lower. In analyses adjusting for demographic and medical factors, black patients were 34% less likely and Hispanic patients were 31% less likely to initiate dialysis with PD than white patients. This was attenuated after adjusting for socioeconomic factors, although black patients remained 24% and Hispanic patients remained 10% less likely to initiate dialysis with PD. Remarkably, this race and ethnicity discrepancy increased substantially when modality use at 90 days following dialysis initiation was examined.

Shen et al both confirm and expand on prior research,⁷ specifically by highlighting use at dialysis initiation and at 90 days, while also showing that adjustment for zip code–specific socioeconomic factors modestly attenuates but does not abrogate disparities in home dialysis use, particularly among black and Hispanic patients with kidney failure. This study also has some limitations. It is not based on patient-level socioeconomic data and does not have patient-level information about why individual patients were not considered for home dialysis. Although challenging, future research should explore collection of such data.

Racial and ethnic disparities in the initiation of dialysis at home have declined slightly over time. Perhaps the modest financial incentive for PD in the 2011 ESRD bundle has helped; perhaps expansion of access to health care under the Affordable Care Act^{8,9} has helped. However, despite the paucity of absolute contraindications to home dialysis,⁴ enormous barriers remain. Overcoming them will require population-wide strategies that can overcome current disparities in use.

More than a decade ago, Prakash et al¹⁰ used mixed-methods research to explore barriers to PD in Canada. Canadians’ almost universal access to chronic kidney disease care before dialysis initiation allows us to draw important lessons. A multidisciplinary team comprising a nephrologist, social worker, chronic kidney disease nurse, and PD nurse classified more than a third of patients as ineligible for PD. In regression models, family support, predialysis medical care, and availability of home care were all strongly associated with PD eligibility. Semi-quantitative analyses highlighted critical barriers, including nonmodifiable medical factors such as abdominal cancers, and social factors, including home characteristics and cultural issues. For PD-eligible patients

Box 1. Socioeconomic Barriers to Home Dialysis and Potential Means to Address These Barriers

Domains	Possible Solutions
Environmental <ul style="list-style-type: none"> • Insufficient space for supplies • Shared bedrooms and bathrooms • Housing insecurity • Pets • Utility expenses 	Increase frequency of supply deliveries Provide funds for housing for home dialysis patients Support community house dialysis Cover dialysis-related utility costs Fund “handyman” consult to address modifiable home factors
Social <ul style="list-style-type: none"> • Limited family support • Limited time due to patient supporting others • Resides in a long-term care facility 	Funding for assisted PD and patient care assistants Make respite PD care available Provide additional funding and incentives for rehabilitation and long-term care facilities for providing PD
Knowledge and health literacy <ul style="list-style-type: none"> • Limited predialysis care <ul style="list-style-type: none"> ○ Access to CKD care ○ Denial/fear regarding CKD • Insufficient education <ul style="list-style-type: none"> ○ Inappropriate for literacy ○ Not adequate in patient’s native language ○ Noninclusive of care partners • Impacts on confidence in performing self-care 	Maintain improved access to health care coverage, including expansion of Medicaid in all states Train providers in more effective communication Develop language- and literacy level–appropriate educational instruments Fund education of patient care partners, even if patients are not present Develop educational tools that specifically address care partners Fund resources needed for telehealth and remote monitoring

Abbreviations: CKD, chronic kidney disease; PD, peritoneal dialysis. Items abstracted from Chan et al,⁵ Crews et al,¹³ and Prakash et al.¹⁰

who selected in-center hemodialysis, multiple reasons emerged favoring in-center hemodialysis over home dialysis, including a general preference for in-center treatment, task difficulty, and social support issues. Less common but equally important patient-centered lifestyle issues included the presence of pets and a desire to swim. Among lower income individuals, social support and environment both were twice as likely to be cited as a barrier to home dialysis.

Both Prakash et al¹⁰ and the recent National Kidney Foundation Kidney Disease Outcomes Quality Initiative conference report on barriers to home dialysis⁵ note that increasing use of home dialysis will require multifaceted and sometimes creative solutions if patients and care partners are to succeed in home care regardless of socioeconomic factors. **Box 1**, which is not comprehensive, lists several barriers and possible solutions.

Despite CMS’s increased emphasis on home dialysis in the United States, it seems unlikely that policy makers will

increase funding. However, in a system in which the US government is already “all in,” spending \$35 billion per year for Medicare ESRD beneficiaries alone,² interventions that could improve patient experience and quality of life while potentially reducing overall annual per-patient costs should represent a sensible use of financial resources.

Given the magnitude of the Medicare ESRD program, relatively small investments could have major long-term dividends for addressing home dialysis disparities. For example, New Zealand has a robust community house hemodialysis program, providing community locations in which patients can perform self-care dialysis when their homes for whatever reason are not well suited to dialysis.¹¹ Canada, Denmark, France, and other countries fund assisted PD,¹² and, in the United States, a small pilot trial showed that providing 1 day of handyman services could positively affect the living situation of older hemodialysis patients.¹³ These steps and numerous others all require investment and all would start small, but if scaled, could have tremendous impact on dialysis patients and their families.

In proposing the ESRD Treatment Choices model, CMS considered excluding beneficiaries experiencing housing insecurity, we presume with the intent of making the model fair to providers. The agency requested public comment on how to assess housing insecurity and similar factors that affect home dialysis use, thus directing scientific attention to social determinants of health. We support the overall goals of this initiative and view tools to account for existing barriers as important for the success of any near-term payment model that targets increased home dialysis use. However, we struggle with how to apply a tool that could be used in this model to ongoing societal needs. Should an assessment tool for housing insecurity be used to exclude patients at high risk from the model or should it be used to identify patients who need extra assistance to achieve their treatment choices and perhaps also to increase reimbursement to providers willing and able to take on the task of treating them at home?

The authors of the Medicare ESRD entitlement understood kidney failure to be both a social and also a biological problem and intended that dialysis care should comprise more than blood washing. In 1966, commenting on a report on the treatment of “indigent” patients, J. Russell Elkinton, the nephrologist serving as editor of the *Annals of Internal Medicine*, made the social problem explicit, wondering “whether ‘chronic dialysis’ does provide a qualitatively satisfactory life to many of these patients under conditions that are less than optimal in terms of expensive facilities, extensive personnel, and the kind of esprit de corps that obviously contributes to the success of the Seattle program.”¹⁴

The important question that we as a society should be asking is not how to design inclusion, exclusion, and adjustment criteria in a payment model, but rather why equitable provision of home dialysis care does not occur and how this can be addressed. Health care should strive to

overcome rather than control for disparities in health. The true limitation here is not a lack of objective measures of housing instability; rather it is that, as a nation, the United States has not found a way to address the disparities that result in the differential receipt of patient-centered medical care, specifically access to home dialysis, regardless of socioeconomic status. The work by Shen et al highlights the true issue that we as a community are facing. Rather than risk adjusting or changing denominators to account for factors such as housing instability when quantifying home dialysis use, we should be making every effort to address these factors directly to improve care for all patients with kidney failure.

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Support: Drs Weiner and Meyer receive support paid to their institution from Dialysis Clinic, Inc, a national not-for-profit dialysis provider.

Financial Disclosure: The authors declare that they have no relevant financial interests.

Other Disclosure: Dr Weiner is a member of the Quality Committee and the Policy and Advocacy Committees of the American Society of Nephrology and is the Editor-in-Chief of *Kidney Medicine*.

Disclaimer: The opinions in this editorial are the authors' own and do not necessarily reflect the opinions of any of the mentioned organizations.

Peer Review: Received January 30, 2020, in response to an invitation from the journal. Direct editorial input by an Associate Editor. Accepted in revised form February 3, 2020.

Publication Information: © 2020 The Authors. Published by Elsevier Inc. on behalf of the National Kidney Foundation, Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Published online February 29, 2020 with doi [10.1016/j.xkme.2020.02.003](https://doi.org/10.1016/j.xkme.2020.02.003)

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