ESKD Treatment Choices Model: 
Responsible Home Dialysis Growth Requires Systems Changes

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The Advancing American Kidney Health (AAKH) initiative has four major goals: early detection of chronic kidney disease (CKD), preventing CKD progression, promoting kidney transplants, and increasing home dialysis. AAKH has undoubtedly increased excitement among the nephrology community, specifically as it relates to home dialysis. As the initiative has the potential to dramatically change the face of nephrology care in the United States, it is critical that all steps be taken to ensure its success. Poorly executed efforts to rapidly increase home dialysis without promoting and funding a robust infrastructure may result in suboptimal outcomes, thus having an unintended, prolonged negative effect on home dialysis. Herein, we evaluate the feasibility of the proposed payment model to support the growth of home dialysis and its associated infrastructure, potential unintended consequences of rapid home dialysis growth, the importance of maintaining patient choice in modality selection, and propose adjunctive programs to ensure a safe and sustainable growth in home dialysis.

The AAKH initiative proposes a mandatory payment model, the End Stage Kidney Disease Treatment Choices Model (ETC), which will randomize new ESKD starts during 2020-22 into one of two treatment arms (Fig 1). Centers allocated to the ETC arm will receive a financial incentive or penalty based on performance metrics, in particular the fraction of total dialysis beneficiary years which are on home dialysis. Specifically, there will be a 3, 2, and 1% Home Dialysis Payment Adjustment in calendar years 2020, 2021, and 2022, respectively. Furthermore, there will be a Performance Payment Adjustment (PPA) with a possible upwards adjustment of 5% and downwards of 8% to the facility, and upwards of 5% and downwards of 6% to the provider in periods 1 and 2 with subsequent adjustments in future periods. Furthermore, those in the ETC model would receive an incentive payment for kidney transplant up to $15,000 over the first three years of transplant. Those randomized to the Conventional Payment Model will continue to be paid under the existing payment model. The proposed primary endpoint is the proportion of ESKD patients on home dialysis or receiving a kidney transplant.

This is not the first government attempt to increase PD utilization using incentives (Table 1). The 1983 composite rate provided the same reimbursement for hemodialysis and home dialysis. Next, the 1990 Omnibus Budget Reconciliation Act further incentivized PD by paying 130% of the median composite hospital rate of in-hospital hemodialysis. Most recently, the 2011 ESKD Prospective Payment System (PPS) provided additional incentives for home dialysis. Previously, although per-treatment Medicare payments were identical for both dialysis modalities, there was a large incentive for in-center hemodialysis due to separate reimbursement for dialysis medications, such as erythropoietin, iron, and vitamin D. The PPS pays a single bundled rate for dialysis treatments and drugs; since PD patients used fewer dialysis medications, profit margins increased substantially for dialysis providers, but was relatively cost neutral for physicians. In the first 3 years after the PPS implementation (2011-13), early initiation of home dialysis (within 90 days of ESKD) increased modestly from 9.4 to 12.6%. In summary, multiple payment incentive plans have produced fairly limited increases in PD (Figure 2).
The ETC model, similar to previous models, provides significant financial incentives to improve home dialysis utilization. However, although the adjustments for the nephrologist and the dialysis are proportionally similar, the absolute value of incentives is far greater for the dialysis provider, given the greater total reimbursement for treatments. Although the ETC incentivizes the dialysis provider and nephrologists, it does little to incentivize key non-nephrologist components of a successful home dialysis program which could be detrimental given the aggressive timeline of 80% incident home dialysis or transplantation by the end of 2025).

A successful PD program requires a comprehensive infrastructure that, at a minimum, includes operators trained in PD catheter insertion and revision, a key omission from the ETC incentives. Many centers struggle to find one operator to place these accesses, let alone a group capable of placing the volume of catheters needed for this initiative. Revisions of PD catheters is just as concerning a problem as placement, as this requires primarily urgent surgical interventions to ensure technique survival. Incentives for operators with performance bonus would be highly advisable to ensure the success of the ETC. Currently, numerous hospitals lack the ability to care for home dialysis patients, including trained staff, nephrologists, and stocked home dialysis supplies. Incentives for these hospitals to care for home dialysis patients would also help ensure the ETC success. Home dialysis patients needing rehabilitation or skilled nursing facilities are often transitioned to in-center hemodialysis due to lack of this service. There is no provision for nursing facilities to offset costs of nurse training required to care for patients on PD. Assisted PD makes PD possible in many patients with mental or social barriers, thereby increasing the pool of potential home dialysis patients. It is currently offered in Canada and several European countries, but not in the U.S. Assisted PD adds substantial costs for the personnel who visit the patients’ homes twice daily to initiate and terminate PD sessions. The annual cost of assisted PD was about $17,000 in France and Denmark and $9,000 in Canada in 2006. Although introduction of assisted PD may substantially increase PD use, there is no provision in AAKH to pay for assisted PD.

There is concern that a rapid rise in the use of home dialysis may lead to increased technique failure rates. An initial study that looked at the effect of the PPS on technique failure rates showed no change in these rates from 2011 to 2013, indicating an early success for the PPS. However, a more rapid increase in home dialysis utilization, in a healthcare system not ready for this influx, may lead to poor outcomes. U.S. nephrology fellows undergo limited PD training. Not surprisingly, nearly half of U.S. nephrologists do not feel competent to care for PD patients. Accommodating a dramatic increase in PD starts will require training nephrologists, not just in initiation, but also in the long-term maintenance of home dialysis. Awaiting new nephrologists with better training will be too late to achieve the desired home dialysis growth, however. Outcomes in larger home dialysis centers are superior to those in than smaller home dialysis centers, in terms of lower technique failure rates and mortality. Strategies to improve the success of the ETC include the funding of Project Extension for Community Healthcare Outcomes (ECHO) to disseminate expertise from centers of excellence to smaller sites. Furthermore, support for home dialysis fellowships through post-graduate funding could go a long way to increase home dialysis expertise in this country.
Although most nephrologists believe that PD offers improvements in quality of life and autonomy, and should be offered to every dialysis patient, there may be valid reasons that patients decline PD. These include concerns about social isolation, reluctance to do daily dialysis, feeling overwhelmed by having to do it all by themselves, or fear of an emergency. There is a critical need to increase access to such education by allowing the Kidney Education Benefit to be provided over telehealth in the patients’ home and payment of peer mentors. Development and adoption of appropriate and standardized education is necessary for all dialysis modalities. It is crucial to ensure patient choice in modality selection and ensure transparency in dialysis education to avoid coercion due to financial gain. Because the AAKH initiative is revenue neutral, any increase in payments for patients starting home dialysis will be counterbalanced by penalties to underperforming sites. These incentives underscore the need for patient advocacy to ensure patient choice and transparency in joint ventures.

To maximize the success of the AAKH, we urge the government to increase funding for initiatives to build the requisite infrastructure and track multiple clinical outcomes (Table 2). We recommend systematic complementary incentives for: 1) operators who place and revise peritoneal dialysis catheters; 2) hospitals that provide home dialysis; 3) nursing facilities that care for home dialysis patients; 4) removal of the originating site restrictions for the KDE and transplantation care for telemedicine; 5) funding of Project ECHO related to home dialysis, 6) development of standard education for all patients with CKD stage 4, and 6) funding of assisted PD. These steps are critical to achieve the desired goal of increasing home dialysis, while at the same time ensuring that patient outcomes are not jeopardized.

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Author Contributions
Eric Wallace: Writing - review and editing
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Table 1: History of government policies to increase home dialysis use in the U.S.

<table>
<thead>
<tr>
<th>Policy (year)</th>
<th>Key features</th>
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<tr>
<td>Composite rate (1983)</td>
<td>Same reimbursement for HD and home dialysis</td>
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<tr>
<td>Omnibus Budget Reconciliation Act (1990)</td>
<td>PD payment = 130% of median composite payment for in-hospital HD</td>
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<tr>
<td>Prospective Payment System (2011)</td>
<td>Bundled payment for dialysis treatment and medications</td>
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<tr>
<td>Advancing American Kidney Health (2020)</td>
<td>Up to 3% increase in reimbursement for home dialysis</td>
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Table 2: Additional features that may enhance the success of AAKH

Payment for assisted PD
Subsidizing telemedicine for PD patients in remote locations
Training of nephrologists for PD
Training of surgeons for PD catheter procedures
Training of PD nurses
Collection of secondary endpoints
  - Death
  - Hospitalization
  - Catheter infections
  - Overall health care costs
  - Quality of life
Figure legends

Fig 1: Scheme of mandatory AAKH initiative

Fig 2. PD use over the last few decades, and timing of government incentives to increase its use. OBRA, Omnibus Budget Reconciliation Act; PPS, Prospective Payment System; AAKH, Advancing American Kidney Health. Adapted from 15.
References

Participant enrollment: Incident dialysis patient

- ESRD Treatment Choices (ETC)
  - Upward adjustment in nephrologist reimbursement: 3% in 2020; 2% in 2021; 1% in 2022
  - Performance Payment Adjustment (PPA) with a possible upwards adjustment of 5% and downwards of 8% to the facility, and upwards of 5% and downwards of 6% to the provider

- Conventional Payment Model
  - Payment not affected

Patient enrollment

Patient randomization and incentives

Study endpoints

Secondary endpoints

Proportion of dialysis patients on home dialysis

Not specified
Fig 2

Percent of dialysis patients on PD

Composite Rate

OBRA

PPS

AAKH