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Relative Mortality in Daily Home and Matched Thrice-weekly In-center Hemodialysis Patients

Introduction
- Daily home hemodialysis (DHHD) is a rapidly growing alternative to thrice-weekly, in-center hemodialysis (3xIHD).
- DHHD is likely to improve fluid control and better control hypertension, plausibly potentiating lower risk of cardiovascular morbidity. The inherent flexibility of DHHD may also improve quality of life.
- Whether these mechanisms ultimately lower the risk of death is unclear.
- Previous studies have concluded that daily hemodialysis (either home or in-center) is associated with a much lower mortality rate than 3xIHD.1,2,3

Methods
- Exposed patients included those initiating DHHD ( NxStage System One) in 2005-2007, on the basis of provider registry data.
- Patient data were linked to the USRDS database. We retained those patients who either had Medicare as the primary payer for ≥3 months before DHHD initiation or began renal replacement therapy (RRT) ≥6 months before initiation.
- For each DHHD patient, we selected 5 controls from the USRDS database.
- Each control underwent 3xIHD on the exposed patient’s DHHD initiation date.
- Controls were matched according to an ordered set of covariates: age, hospital days during preceding 3 months, hemoglobin at during preceding 3 months, body mass index, transplant waiting list status, cardiovascular failure, RRT duration, race, cancer, primary end-stage renal disease cause, stroke, peripheral vascular disease, other cardiac disease, diabetes, ischemic heart disease, gender, and dual eligibility for Medicare and Medicaid.
- We performed intention-to-treat analysis in all patients and as-treated analysis in only Medicare patients, with follow-up through December 31, 2008.

Results
- The cohort included 1,873 DHHD patients.
- Compared to the 3xIHD population alive on January 1, 2007, DHHD patients were much younger, more likely to be male and non-African American, and were healthier (i.e., had less comorbidity, received less epoetin alfa, and were hospitalized less frequently).
- Matching successfully balanced all measured covariates except dual eligibility (which did not independently predict death [adjusted hazard ratio = 1.03, P = 0.57]).

Conclusions
- Over a relatively brief follow-up interval, DHHD was associated with lower risk of death, compared to 3xIHD.
- The estimated effect was smaller than previously reported, likely owing to superior control of confounding.
- However, the estimated effect is largely congruent with recent findings from the Frequent Hemodialysis Network (FHN) trial, in which hemodialysis six times per week resulted in significant improvement in the composite endpoint of death or increase in left ventricular mass (NEJM, 2010).
- The estimated effect was insensitive to the definition of the follow-up interval, and there was no credible evidence of heterogeneity in the effect across strata defined by patient characteristics.
- Continued follow-up of DHHD patients is needed to more precisely estimate the effects of DHHD on mortality.
- Further studies are needed to assess the effects of DHHD on morbidity, including cardiovascular disease and infection.