Change in Serum Albumin Following Initiation of Expanded Hemodialysis

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Introduction and Objective

- Currently the most common type of renal replacement therapy in the US is conventional hemodialysis (HD) using a high-flux (HF) dialyzer, which, while efficient at removing small (<500Da) toxins, does not readily clear larger molecules.[1]
- Expanded HD utilizes a dialyzer with larger pore sizes to increase the clearance of uremic toxins and other solutes of larger molecular weight (500-45,000Da).[2]
- The porosity of this dialyzer class results in increased loss of albumin during HD treatment.
- It has been hypothesized that serum albumin decreases after initiation of expanded HD, but there are no large studies that establish whether this change in serum albumin is clinically significant.[3]
- In this study, we analyzed serial measurements of serum albumin during the first 6 months of follow-up following dialysis with expanded HD.

Methods

- Beginning in summer 2025, 33 dialysis clinics were identified that were of requisite size, geographically positioned within supply lines, and whose medical directors expressed interest in implementing dialyzers with expanded HD.
- The governing body of each clinic approved switching the formulary dialyzer to a dialyzer capable of expanded HD (in two sizes).
- The quality initiative began in October 2025. From each of 33 DaVita Kidney Care (DKC) clinics participating in the MODEL initiative, we identified all adult end-stage kidney disease patients who initiated expanded HD on or after first use of the new dialyzer (Theranova 400/500, Vantive Healthcare) in the clinic.
- Contemporaneous control patients who underwent HD with a high-flux (HF) dialyzer were ascertained from 30 randomly selected DKC clinics.
- Patients were followed for 6 months after initiation of expanded HD (or for control patients, an imputed index date).
- Patients with ≥1 serum albumin measurement during the 2-month interval ending on the date of follow-up initiation were retained for analysis.
- Change in serum albumin during follow-up was modeled with a linear mixed model, with adjustment for age, sex, race, HD vintage, and baseline serum albumin.

Results

Table 1: Patient Characteristics

	Conventional HD N=2,434	Expanded HD N=2.273
Age, years, mean (SD)	63.1 (14.6)	64.2 (14.2)
Male sex	57.9%	59.3%
Race		
White	45.1%	51.1%
Black	32.8%	32.2%
Asian	6.5%	3.2%
Other	12.0%	11.2%
Unknown	3.6%	2.3%
Vintage, years, mean (SD)	3.5 (3.4)	3.4 (3.3)

Figure 1: Mean Serum Albumin Levels

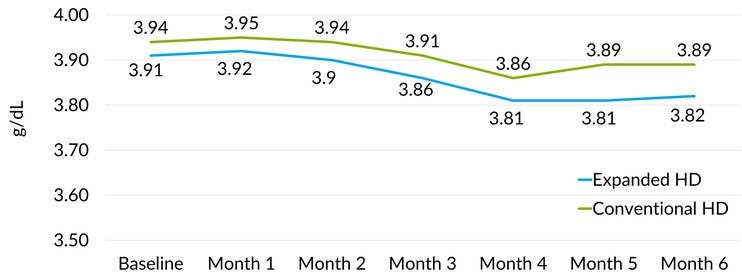


Figure 2: Percentage of Patients with Serum Levels <3.5 g/dL

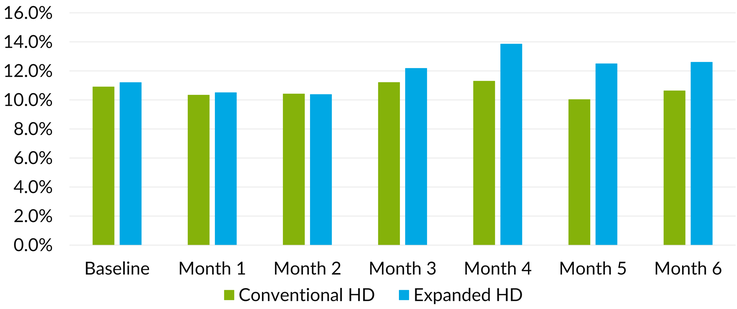


Figure 3: Adjusted Effects of Expanded HD on Serum Albumin Levels

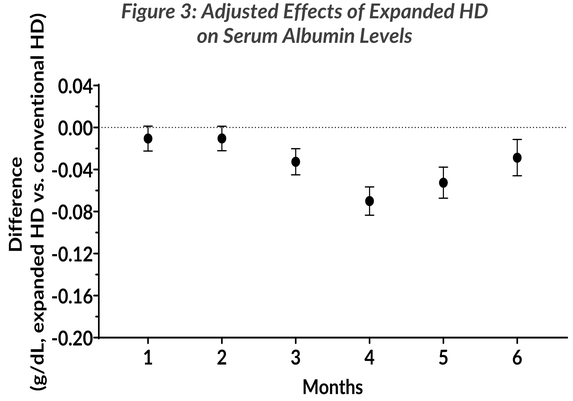
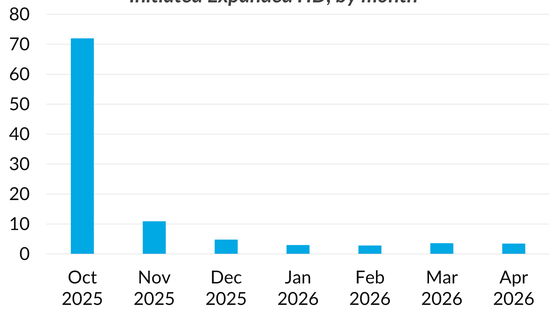


Figure 4: Percentage of Patients that Initiated Expanded HD, by month



Results & Conclusions

- At baseline, mean serum albumin was 3.91 g/dL in the expanded HD group and 3.94 g/dL in the HF dialyzer group (Figure 1).
- Serum albumin declined 0.1 g/dL during the first 4 months after initiation of expanded HD and then stabilized (Figure 2).
- Compared to HD with a HF dialyzer, adjusted effects of expanded HD on serum albumin were −0.07, −0.05, and −0.02 g/dL at 4, 5, and 6 months of treatment, respectively (Figure 3).
- A majority of patients initiated expanded HD when the quality initiative began in October 2025. (Figure 4)

Conclusions: Relative to conventional HD with a high-flux dialyzer, expanded HD is associated with a small, clinically insignificant, decline in serum albumin, which was mitigated by 6 months of therapy.

References & Acknowledgments

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