Is Hypoalbuminemia a Contraindication to Expanded Hemodialysis?

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Introduction and Objective

- Expanded hemodialysis (HD) utilizes a medium cut-off dialyzer to increase the clearance of uremic toxins and other solutes of larger molecular weight, but greater porosity results in increased loss of albumin.[1]
- Because albumin is a potent predictor of clinical outcomes, it is plausible that preexisting hypoalbuminemia is a contraindication to expanded HD.[2,3]
- We analyzed changes in serum albumin among hypoalbuminemic patients in the MODEL initiative, in which a middle cut-off dialyzer was installed as the formulary dialyzer in 33 dialysis clinics.

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 started 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), with censoring at transfer to home dialysis, death, transplantation, recovery of kidney function, or transfer out of DKC clinics.
- Patients with mean serum albumin <3.5, <3.2, or <3.0 g/dL 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.

Table 1: Patient Characteristics

	Conventional HD N=255	Expanded HD N=250
Age, years, mean (SD)	64.4 (14.3)	66.6 (15.7)
Male sex	56.0%	53.4%
Race		
White	42.5%	48.1%
Black	32.6%	28.2%
Asian	7.7%	3.8%
Other	9.5%	11.5%
Unknown	7.7%	8.4%
Vintage, years, mean (SD)	2.5 (3.3)	2.6 (3.3)

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Results

Figure 1: Patient albumin levels, grouped by baseline albumin level, <3.5 (A), <3.2 (B), <3.0 (C) g/dL

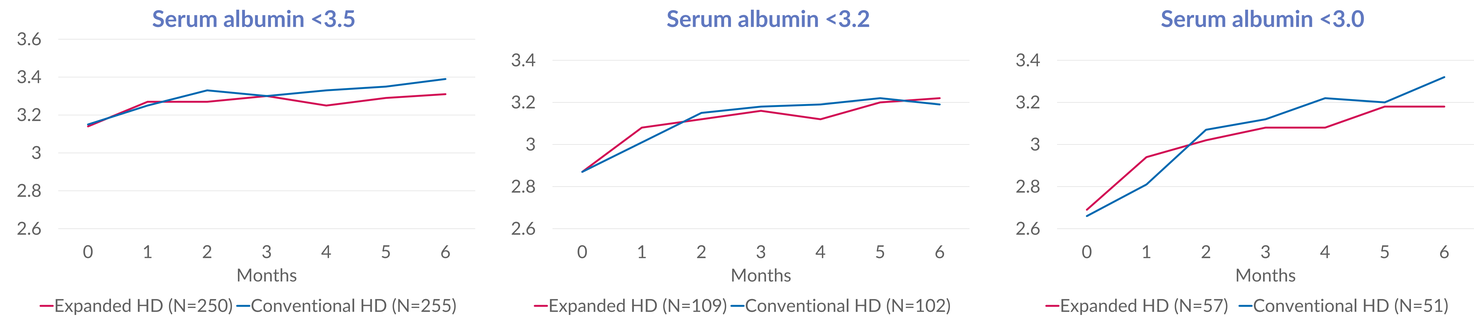


Figure 2: Adjusted effects of expanded HD on serum albumin levels, <3.5 (A), <3.2 (B), <3.0 (C) g/dL

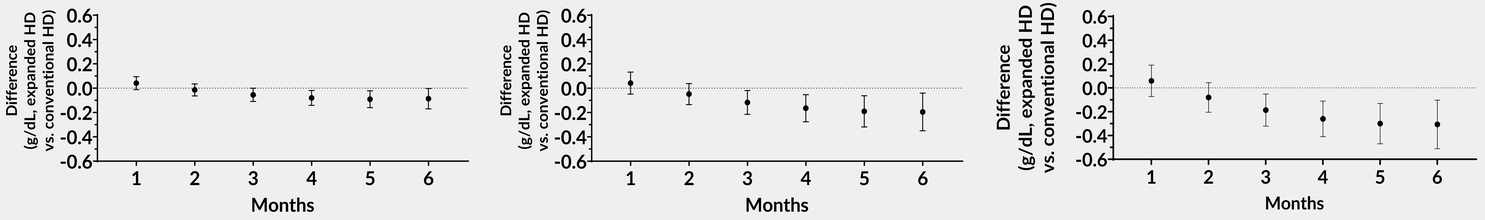
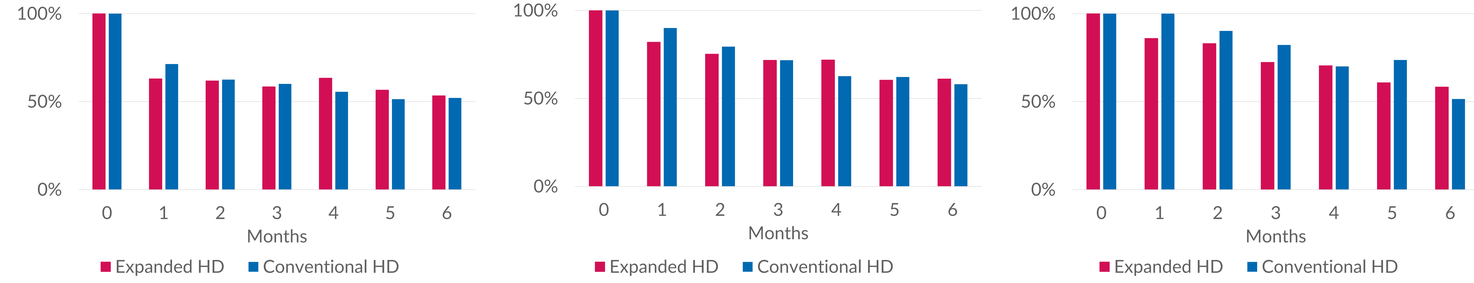


Figure 3: Percentage of patients with serum albumin <3.5 g/dL, among patients with baseline serum albumin <3.5 (A), <3.2 (B), <3.0 (C) g/dL



Results & Conclusions

Results:

- The study cohort included 505 with albumin <3.5 g/dL, 211 with albumin <3.2 g/dL, and 108 patients with baseline serum albumin <3.0 g/dL.
- After initiation of expanded HD, serum albumin increased in all three groups and reached a range of 3.2 to 3.4 g/dL after 6 months (Figure 1).
- Compared to conventional HD with a HF dialyzer, adjusted effects of expanded HD on serum albumin were between −0.06 and −0.10 after 6 months of treatment, although none were statistically significant (P >0.2) (Figure 2).
- The percentage of patients with serum albumin levels <3.5 g/dL decreased over 6 months (Figure 3).

Conclusions:

- Preexisting hypoalbuminemia is not a contraindication to expanded HD.
- Regression to the mean, resulting in an increase in serum albumin, may be anticipated after initiation of expanded HD.

References & Acknowledgements

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