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### **Estimating the Effect of Low Dialysate Calcium on Clinical Outcomes among US Patients**

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Over the past several years, some clinics in the U.S. have reduced dialysate calcium concentration (dCa) from 2.50 to 2.25 or 2.00 mEq/L (together referred to as low dCa herein), potentially to avoid calcium overload. To date, there has been no rigorous systematic examination of the effects of low dCa on clinical outcomes. The goal of the present study was to compare clinical outcomes among patients at dialysis clinics that converted from predominant use (>75% patients) of 2.50 mEq/L dCa to predominant use of low dCa (converter clinics) versus those that maintained predominant use of 2.50 mEq/L dCa (control clinics) from January 2008 through December 2010. Converter and control clinics were matched (1:up to 4, with replacement) on the basis of mean age, % incident patients, geography, and clinic length of ownership. Mixed linear models were fit to assess change in event rates pre- (Months -3 to -1) to post-conversion (Months 0 to +11) among converter clinics versus contemporaneous change in control clinics. Results were expressed as relative rate ratios (RRRs): values >1 indicate worse outcomes among converter clinics. Responses were estimated separately for post-conversion months 0-2 and 3+ to allow for possible latent effects.

Converter (n=79) and control (n=274) clinics were well balanced for case mix. Compared to control clinics, converter clinics experienced a notable decrease in serum calcium and increase in serum phosphate and PTH, and a notable increase in the proportion of patients using phosphate binders, vitamin D sterols and calcimimetics. Patients in converter clinics experienced greater risk of heart failure exacerbation, atrial fibrillation, intra-dialytic hypotension, and hypocalcemia (serum calcium <8.0 mg/dL). No differences were observed in rates of all-cause mortality or hospitalization.

These findings indicate potential safety concerns when a dCa <2.50 mEq/L is utilized. In addition, less biochemical control and greater medication utilization may also be consequences of the use of low dCa.

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