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## Two phosphAtE taRGets in End-stage renal disease Trial (TARGET): A Randomized Controlled Trial

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### Abstract

**Background and objectives** Hyperphosphatemia is common among recipients of maintenance dialysis and is associated with a higher risk of mortality and cardiovascular events. A large randomized trial is needed to determine whether lowering phosphate concentrations with binders improves patient-important outcomes. To inform such an effort we conducted a pilot randomized controlled trial.

**Design, setting, participants, & measurements** We conducted a randomized controlled trial of prevalent hemodialysis recipients already receiving calcium carbonate as a phosphate binder at five Canadian centers between March 31, 2014 and October 2, 2014. Participants were randomly allocated to 26 weeks of an intensive phosphate goal of 2.33–4.66 mg/dl (0.75–1.50 mmol/L) or a liberalized target of 6.20–7.75 mg/dl (2.00–2.50 mmol/L) by titrating calcium carbonate using a dosing nomogram. The primary outcome was the difference in the change in serum phosphate from randomization to 26 weeks.

**Results** Fifty-three participants were randomized to the intensive group and 51 to the liberalized group. The median (interquartile range) daily dose of elemental calcium at 26 weeks was 1800 (1275–3000) mg in the intensive group, and 0 (0–500) mg in the liberalized group. The mean (SD) serum phosphate at 26 weeks was 4.53 (1.12) mg/dl (1.46 [0.36] mmol/L) in the intensive group and 6.05 (1.40) mg/dl (1.95 [0.45] mmol/L) in the liberalized group. Phosphate concentration in the intensive group declined by 1.24 (95% confidence interval, 0.75 to 1.74) mg/dl (0.40 [95% confidence interval, 0.24 to 0.56] mmol/L) compared with the liberalized group. There were no statistically significant differences between the two groups in the risk of hypercalcemia, hypocalcemia, parathyroidectomy, or major vascular events.

**Conclusions** It is feasible to achieve and maintain a difference in serum phosphate concentrations in hemodialysis recipients by titrating calcium carbonate. A large trial is needed to determine if targeting a lower serum phosphate concentration improves patient-important outcomes.

Hemodialysis phosphate binders randomized controlled trials  
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