



Cabo San Lucas, Mexico

PIC QUESTION OF THE WEEK: 8/22/11

Q: What are the current recommendations for the management of hyperphosphatemia?

A: Hyperphosphatemia is generally defined as a serum phosphate level greater than 4.5 mg/dl. Although there may be alternative causes, it typically occurs in patients with chronic kidney disease (CKD). Complications include hypocalcemia and secondary hyperparathyroidism. The most common signs and symptoms of hyperphosphatemia include calcinosis of the skin and vasculature due to deposition of calcium phosphate. Patients with CKD develop increased phosphate levels because of their reduced capacity to eliminate it. This results in a decrease in *free* calcium levels accompanied by increased secretion of parathyroid hormone (PTH). Enhanced PTH secretion prevents the kidneys from retaining phosphate and further increases vitamin D₃ levels, which results in additional absorption of calcium. The goal in the treatment of hyperphosphatemia is to restore serum phosphate levels to more normal physiologic values and prevent secondary hyperparathyroidism. Dietary phosphate restriction may not be adequate, thus necessitating the need for administration of oral phosphate binders. Historically, aluminum compounds have been the drugs of choice; however, chronic use may result in aluminum toxicity, thus these agents are no longer recommended. Calcium containing oral phosphate binders generally provide an inexpensive and effective treatment option. These compounds bind to dietary phosphate in the gastrointestinal tract, thus blocking absorption. When dietary restriction and calcium agents fail or are contraindicated, it may be necessary to introduce alternative therapies. Sevelamer (an anion-exchange resin) is available as both carbonate and hydrochloride salts. Lanthanum, a non-calcium phosphate binding agent, is another treatment option. There is little evidence that either of these agents is superior to the other. Lanthanum has poor systemic bioavailability, but long term use may result in the appearance of the drug in bone. The following table includes recommended agents for the treatment of hyperphosphatemia in patients with CKD.

Drugs Used in the Management of Hyperphosphatemia

Drug	Usual Daily Dose
· calcium acetate 667 mg (PhosLo®, Calphron®)	· 3 to 4 capsules three times daily with meals
· calcium carbonate 500 mg (Tums®)	· 1,500 – 7,500 mg daily with meals
· lanthanum carbonate 500 mg (Fosrenol®)	· 2 tablets three times daily with meals
· sevelamer hydrochloride 400 mg (Renagel®)	· 2 to 4 tablets three times daily with meals
· sevelamer carbonate 800 mg (Renvela®)	· 1 to 2 tablets three times daily with meals

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- Navaneethan SD, Palmer SC, Craig JC, et al. Benefits and harms of phosphate binders in CKD: a systematic review of randomized controlled trials. *Am J Kidney Dis* 2009;54:619-37.

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