Phosphate Binders (Non-Calcium, Non-Aluminum)
Lanthanum Carbonate, Sevelamer Carbonate
for the Management of Hyperphosphatemia in Chronic Kidney Disease
Criteria for Use
September 2011

VA Pharmacy Benefits Management Services, Medical Advisory Panel, and VISN Pharmacist Executives

The following recommendations are based on medical evidence, clinician input, and expert opinion. The content of the document is dynamic and will be revised as new information becomes available. The purpose of this document is to assist practitioners in clinical decision-making, to standardize and improve the quality of patient care, and to promote cost-effective drug prescribing. **THE CLINICIAN SHOULD UTILIZE THIS GUIDANCE AND INTERPRET IT IN THE CLINICAL CONTEXT OF THE INDIVIDUAL PATIENT. INDIVIDUAL CASES THAT ARE EXCEPTIONS TO THE EXCLUSION AND INCLUSION CRITERIA SHOULD BE ADJUDICATED AT THE LOCAL FACILITY ACCORDING TO THE POLICY AND PROCEDURES OF ITS P&T COMMITTEE AND PHARMACY SERVICES.**

The Product Information should be consulted for detailed prescribing information.

EXCLUSION CRITERIA (if ONE is checked, patient is not eligible)

☐ Hypophosphatemia

☐ Bowel obstruction

INCLUSION CRITERIA FOR A NON-CALCIUM, NON-ALUMINUM PHOSPHATE BINDER (must fulfill the following to be eligible)

The non-calcium, non-aluminum phosphate binders (lanthanum carbonate, sevelamer carbonate) are restricted to Nephrology Service[a] and are to be used for the management of patients with chronic kidney disease (CKD) and hyperphosphatemia according to the criteria below:

☐ Diagnosis of Stage 3 to 5 CKD (refer to estimated glomerular filtration rate range below) with or without kidney replacement therapy (i.e., hemodialysis or peritoneal dialysis)

Stage 3 CKD	Stage 4 CKD	Stage 5 CKD
30 to 59 mL/min/1.73m^2	15 to 29 mL/min/1.73m^2	< 15 mL/min/1.73m^2

AND

☐ Documented hyperphosphatemia

AND one or more of the following:

- ☐ Persistently elevated serum phosphorus despite dietary restriction of phosphate AND adherence to calcium based phosphate binders[b]
- ☐ Intolerance (e.g., unmanageable significant adverse event) to a calcium based phosphate binder
- ☐ Elevated total serum calcium (corrected for serum albumin)[c] on conventional treatment with calcium based phosphate binding therapy[b] and despite adjustment of vitamin D preparations to lowest effective dose
- ☐ Low intact plasma parathyroid hormone (iPTH) level with normal or elevated serum calcium associated with adynamic bone disease

[a] Restricted to Nephrology for the initial prescription; if deemed appropriate, local P&T Committees may approve selected providers to renew prescriptions

[b] e.g., recommendations have been to limit elemental calcium intake from phosphate binders to < 1500 mg/d, with the total daily intake (including dietary calcium) of elemental calcium not to exceed 2,000 mg. In general, it is recommended that 2.5 mEq/l (1.25 mmol/l) calcium dialysate for patients on hemodialysis, and 2.5 to 3.0 mEq/l (1.25 to 1.5 mmol/l) for peritoneal dialysis should be part of therapy to reduce hypercalcemia; however, this should be based on individual patient requirements. An aluminum containing phosphate binder should NOT be used for long-term management of hyperphosphatemia due to potential toxicity.

[c] Calculation for corrected total serum calcium=total calcium + 0.8 (4 - serum albumin). The normal serum albumin of 4.0gm/dl is based on measurements using bromocresol green. If the bromocresol purple method is used, the normal serum albumin should be adjusted accordingly (e.g., 3.5gm/dl).
[4 gm/dl (normal serum albumin) – most recent serum albumin]
Ex. Calcium 9.9 mg/dl; albumin 3.2 gm/dl
[4 – 3.2] = 0.8; 0.8 X 0.8 = 0.64
9.9 + 0.64 = 10.54 (10.5 mg/dl is the corrected serum calcium)

DOSING AND ADMINISTRATION

- Lanthanum carbonate (tablets): doses should be administered with meals and should be chewed thoroughly (tablets can also be crushed to assist in chewing) prior to swallowing; tablets should not be swallowed intact. Initial recommended total daily dose is 1500 mg; doses may be increased (e.g., by 750 mg every 2 to 3 weeks) until serum phosphorus goal is achieved. Usual maintenance dose (to reduce phosphorus < 6.0 mg/dl in clinical trials) is 1500 mg to 3000 mg daily (maximum dose studied 4500 mg daily). The manufacturer recommends that medications that interact with antacids should not be administered within 2 hours of lanthanum carbonate.
- Sevelamer carbonate (tablets and powder): doses should be administered with meals. Initial recommended dose is 800 mg to 1600 mg three times daily; doses may be increased by 800 mg three times daily every 2 weeks, based on response. In clinical trials with sevelamer carbonate tablets, mean doses of 5.5 gm and 6.0 gm per day reduced mean phosphorus levels to 4.8 and 4.6 mg/dl, respectively. Average prescribed daily dose is 7.2 gm/day (maximum dose studied 14 gm daily). The contents of the powder packet should be mixed with the recommended amount of water so as to suspend the medication (it will not dissolve); the entire contents should be consumed within 30 minutes, or the preparation resuspended immediately prior to consumption. Patients receiving medications where a reduction in bioavailability may result in a significant clinical impact on the safety or efficacy of the medication should be instructed to take the medication at least 1 hour before or 3 hours after sevelamer carbonate, or the provider should consider monitoring blood levels of the interacting medication, if applicable.

MONITORING

- Lanthanum carbonate: serum phosphorus levels should be monitored as needed during titration and regularly once on maintenance dose. Decreased bioavailability of levothyroxine with concomitant administration of lanthanum carbonate (levothyroxine should be taken at least 2 hours before or 2 hours after lanthanum carbonate); monitor TSH in patients taking lanthanum carbonate and thyroid hormone replacement therapy
- Sevelamer carbonate: phosphorus, bicarbonate, chloride levels should be monitored. Rare cases of increased TSH reported with concomitant levothyroxine and sevelamer hydrochloride; monitor TSH in patients taking sevelamer carbonate and levothyroxine

ISSUES FOR CONSIDERATION

Pregnancy:

- Lanthanum carbonate is Pregnancy Category C: data are not available on the effect of lanthanum carbonate on the absorption of vitamins and other nutrients; lanthanum carbonate is not recommended to be used during pregnancy
- Sevelamer carbonate is Pregnancy Category C: sevelamer may decrease vitamin absorption; use with caution in pregnant females
- Patients should be provided contraceptive counseling and education on potential risk vs. benefit of taking these agents if they were to become pregnant

RECOMMENDATIONS FOR DISCONTINUATION OR DECREASE IN DOSE

- If the patient does not respond adequately to an average/ usual maintenance dose (refer to Dosing and Administration above), reevaluate adherence to the medication regimen and to dietary restrictions. Consider referral to dietitian and reinforce importance of medication adherence
- If patient is deemed adherent and experiences no or minimal response to most recent increase in dose (up to maximum studied doses), refer to Dosing and Administration above), recommend decrease to lowest effective dose
- Discontinue therapy or reduce dose if patient experiences a significant drug related adverse event