DERBYSHIRE JOINT AREA PRESCRIBING COMMITTEE (JAPC)

Information Sheet
Phosphate binders for the long-term treatment of hyperphosphataemia in patients on dialysis

Phosphate Binders are indicated for the control of hyperphosphataemia in adult patients with chronic kidney disease.

A number of phosphate binders are available which may be used in the context of a multiple therapeutic approach. It is important to highlight that diet and dialysis (when appropriate) have a large impact on serum phosphate levels. Before phosphate binders are commenced it is important that a nutritional assessment is carried out by a Renal Dietitian to see if dietary modifications are possible.

Phosphate binders used include calcium acetate (Renacet, Phosex), calcium carbonate (Calcichew), sevelamer carbonate (generic*), lanthanum carbonate (Fosrenol) and sucroferric oxyhydroxide (Velphoro). These products may be used in combination with 1-hydroxycholecalciferol (Alfacalcidol) or one of its analogues and/or cinacalcet, to control the development of chronic kidney disease - mineral and bone disorder (CKD-MBD).

Calcium acetate (Renacet) is recommended as the initial phosphate binder therapy for patients with chronic kidney disease whose serum calcium levels are within the normal range. As a first line treatment it provides the best balance of benefits, harm and cost. They should always be used in conjunction with dietary phosphate restriction, to control serum phosphorus levels.

Calcium carbonate (Calcichew) can be used in patients who require a chewable tablet, or for patients whose serum calcium levels are below the normal range (less than 2.2mmol/l). If hypercalcaemia develops with the use of calcium-containing phosphate binders, it may be necessary to change to a non-calcium containing phosphate binder, or a combination of calcium acetate and a non-calcium containing phosphate binder.

Non calcium-based phosphate binders may be used for patients with raised serum calcium levels, despite modifications in the dose of alfacalcidol, and cinacalcet use where appropriate. Sevelamer carbonate is recommended as the first line non-calcium phosphate binder. If a patient requires a chewable tablet or does not tolerate sevelamer, lanthanum carbonate may be required. They may also be required to improve patient concordance by reducing the tablet burden or changing the way the phosphate binder is taken. As there are concerns regarding the calcification and cardiovascular complications with high doses of calcium-based phosphate binders, non-calcium containing phosphate binders may be indicated.

* Sevelamer prescribed generically is cost effective over Renagel and Revelar brands which come as hydrochloride and carbonate salt respectively. The SPC and personal communication, UKMi (June 2016) and local consultant opinion suggest that the different salts of sevelamer are interchangeable with the generic version.

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Prescribing information

Phosphate binder	Brand and formulation	Dose	Other information	Adverse effects	Clinically relevant drug interactions and contra-indications	Monitoring requirements
Calcium Acetate Green after specialist initiation	Renacet 475mg or 950mg (calcium 120mg or 241mg) Tablets	Initially 475mg – 950mg three times per day (one with each meal) Titrate dose with meals and snacks according to serum phosphate levels. Max 6.65g daily	To be taken with meals and snacks Renacet may be easier to swallow and tolerate. To be taken whole – do not crush or chew The maximum daily dose is 14x475mg tablets 7x950mg tablets Patients should adhere to dietary advice	In trials, the most common side effects were: • hypercalcaemia and hypercalciuria. • gastrointestinal disorders including constipation, flatulence, nausea, abdominal pain and diarrhoea. • skin and subcutaneous disorders (rarely) including pruritus, rash and urticaria	Serum calcium should be regularly monitored during concomitant use of thiazide diuretics, as these reduce the urinary excretion of calcium. Systemic corticosteroids reduce calcium absorption so it may be necessary to increase the dose of calcium carbonate. Calcium-based phosphate binders may interfere with the absorption of concomitantly administered tetracycline preparations, quinolones and bisphosphonates. Separate drug administration by 2 hours to minimise interaction. Calcium salts are contra-indicated in hypercalcaemia and hypercalciuria	**Patients receiving phosphate binders will have their phosphate, calcium and parathyroid levels measured at least quarterly in the hospital environment**
	Phosex 1000mg (Calcium 250mg) tablets	Initially three tablets daily (one with each meal). The dose can be increased until the desired serum phosphate level is achieved, as long as hypercalcaemia does not occur. Most patients need 4 to 6 tablets per day.	The maximum daily dose of Phosex is 12 tablets Patients should adhere to dietary advice			
Calcium Carbonate Green after specialist initiation	Calcichew 1.25g (calcium 500mg) Chewable tablets	As required by individual patient depending on serum phosphate level.	To be taken just before meals Patients should adhere to dietary advice			

Phosphate binder	Brand and formulation	Dose	Other information	Adverse effects	Clinically relevant drug interactions and contra-indications
Sevelamer carbonate Green after specialist initiation	Sevelamer Carbonate (generic) 800mg tablets (Prescribe generically as preferred cost-effective choice over Renagel and Revela tabs)	Initially 2.4 – 4.8g daily in 3 divided doses. Adjusted according to serum-phosphate concentration.	To be taken with meals (and snacks if required) Patients should adhere to dietary advice The 2.4g Renvela sachet should be dispersed in 60ml of water prior to administration and the suspension should be ingested within 30 minutes of preparation.	In trials, the most common side effects were: • hypercalcaemia and hypercalciuria • gastrointestinal disorders including constipation, flatulence, nausea, abdominal pain and diarrhoea • skin& subcutaneous disorders (rarely) including pruritus, rash and urticaria Other adverse events reported for lanthanum included clotting of the haemodialysis graft, myalgia and cough.	Sevelamer is contra-indicated in patients with bowel obstruction
	Renvela 2.4g Powder sachet				
Lanthanum Green after specialist initiation	Fosrenol 500mg, 750mg 1000mg Chewable tablets	Usual dose range 1.5 – 3g daily in divided doses adjusted according to serum-phosphate concentration. To be taken with or immediately after meals	To be taken with or immediately after meals Patients should adhere to dietary advice Tablets must be chewed and not swallowed whole Powder sachets to be mixed with soft food and consumed within 15 minutes		Compounds known to interact with antacids should not be taken within two hours of lanthanum. Interactions with tetracyclines and quinolones are theoretically possible Lanthanum is contra-indicated in pregnancy
	Fosrenol 750mg, 1000mg Powder sachets				
Sucroferric Oxyhydroxide RED	Velphoro 500mg chewable tablets	The recommended starting dose is 1500mg (3 tablets) per day (one tablet with each meal). The dose can be increased to a maximum dose of 3000mg (6 tablets) per day. Most patients require 1500mg – 2000mg per day (3 - 4 tablets).	Tablets should be chewed and not swallowed whole. Tablets can be crushed if the patient prefers not to chew tablets.	Can discolour stools black. Other common adverse effects may include diarrhoea, nausea, constipation, vomiting, dyspepsia, abdominal pain, flatulence, tooth discolouration and abnormal taste.	Can reduce the absorption of tetracycline and quinolone antibiotics. If concurrent use cannot be avoided, Velphoro should be avoided 1 hour before and 2 hours after taking antibiotics. Velphoro can theoretically reduce the absorption of levothyroxine. Additional monitoring of TFTs may be required following initiation of treatment and/or any dose change. Must not be used in patients with haemochromatosis or any other iron accumulation disorder.

References

1. Derbyshire Shared Care Guideline – Phosphate binders for the treatment of hyperphosphataemia in patients on dialysis, June 2014
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4. NICE NG203 Chronic Kidney Disease (Aug 2021) https://www.nice.org.uk/guidance/ng203 (accessed March 2022)
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6. UKMi personal communication Ref 99278 (17/6/2016)

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