Patient Information

University Hospitals Coventry and Warwickshire NHS Trust

Nutrition and Dietetics

Kidney disease - Low phosphate diet

What is phosphate

Phosphate is a mineral found in many foods. Phosphate combines with calcium in your bones to help keep them strong. Healthy kidneys usually control the level of phosphate in your blood by removing extra amounts. If your kidneys are not working properly, phosphate levels can rise.

Normal range of blood phosphate levels

Not on dialysis:	0.9 – 1.5 mmol/L
When on dialysis:	1.1 – 1.7 mmol/L

Why it's important to avoid high phosphate levels

In the short term, high phosphate levels in your blood can cause red, sore eyes and itchy skin. In the long term, high levels of phosphate can lead to weaker bones, joint pain and hardening of blood vessels. This increases the risk of heart and circulation (cardiovascular) disease.

How to control your phosphate levels

There are 3 steps you can take to help control your phosphate levels.

Step 1: Reduce your intake of artificial phosphate in additives

Step 2: Reduce your intake of naturally high phosphate foods

Step 3: Take your phosphate binders (if prescribed)

Step 1: Reduce your intake of artificial phosphate additives

This step is discussed in the diet sheet “Getting started on a low phosphate diet.” It gives advice on how to check food labels to recognise the phosphate additives that contribute the most. As a reminder, check food labels for the following:

E338 Phosphoric acid

E339 Sodium phosphates

E340 Potassium phosphates

E341 Calcium phosphates

E541 Sodium aluminium phosphates

E343 Magnesium phosphates

E450 Diphosphates

E451 Triphosphates

E452 Polyphosphates

If your phosphate level are still high after following step 1, this diet sheet will explain the next steps you can take.

Step 2: Reduce your intake of naturally high phosphate foods - while making sure you have enough protein in your diet

Protein-rich foods such as meat, fish, pulses, nuts, and especially dairy foods contain phosphate and are an important part of any diet. This is because not having enough protein can lead to:

- muscle loss and weakness,
- a weaker immune system (less able to fight off infections),
- slow recovery from illness, and
- poorer overall health.

The table below lists the protein-rich foods you still need and shows how much natural phosphate they contain. Try to avoid the high phosphate choices and select more from the medium and low phosphate options.

Meat / protein alternatives

High phosphate	Medium phosphate	Low phosphate
Beef burgers (take away)	Beef burgers (shop bought)	beef burgers (homemade)
Processed meats* such as ham, sausages, sausage rolls, breaded or crumbed chicken/turkey products such as nuggets, drummers, twizzlers Offal, paté		Fresh chicken, turkey, lamb, pork, beef, duck, rabbit, venison
Quorn, Textured Vegetable Protein (TVP)	Pulses (lentils and beans)	Soya or pea protein-based veggie burgers, sausages or pieces, soya mince, tofu, tempeh

* Please note these foods are also high in salt

Fish and shellfish

High phosphate	Medium phosphate	Low phosphate
Pilchards, sardines, sea bass, monkfish or whitebait	Cod, fresh salmon, trout mackerel, kippers*	Tinned salmon (boneless and without skin), tuna (fresh and tinned)
Clams, fresh crab, crayfish, mussels, oysters, scampi	Prawns, shrimps, lobster, squid or cockles	Tinned crab, crab sticks, scallops or winkles
Taramasalata, cod roe or fish paste.		

* Please note these foods are also high in salt

Listeriosis

Avoid ready-to-eat smoked or cured fish products such as smoked salmon or gravlax because of an increased risk of listeriosis.

Listeriosis is an infection caused by bacteria called listeria**.** People with kidney disease are at higher risk of becoming serious ill from listeriosis.

More information on how to reduce the risk of listeriosis can be found at:

Listeriosis - NHS: www.nhs.uk/conditions/listeriosis/

Listeria - Food Standards Agency: www.food.gov.uk/listeria

Dairy / Dairy alternatives

High phosphate	Medium phosphate	Low phosphate
Cheese spreads like Dairylea, Primula. Processed cheese such as cheese slices.	All hard dairy cheese - limit to …… / week	Cream cheese like Philadelphia cheese. Cottage cheese, ricotta cheese.
Vegan nut-based cheese such as Nush, Mouse's Favourite		Vegan Coconut Oil/Soya based cheese such as supermarket own brands, Violife
Condensed, evaporated, dried, sterilised, UHT milk. Tinned coconut milk	Cow's milk (limit to ½ pint/300ml daily) **or** 1 pint/600ml of a milk substitute*: Fresh soya milk, UHT coconut/oat/rice milk	Milk substitutes: Fresh hemp milk can be drunk freely (within your fluid restriction)
Yogurt (substitute ¼ pint/150mls of cow's milk for one 125g pot yogurt **or** $^1/_3$	Fromage frais	Crème fraiche

pint/200mls of fresh soya milk for one 125g pot soya yogurt)		

Note* The phosphate content of cow's milk substitutes can vary a lot between brands. Only soya milk has similar protein to cow's milk. Please speak to your dietitian for advice.

Foods high in fat and sugar*

High phosphate	Medium phosphate	Low phosphate
Biscuits/cakes containing chocolate, nuts or coconut. Scones, rock cakes, Scotch pancakes.	Sponge cakes, Danish pastry, plain flapjack, tea cake	Cream cakes, doughnuts, jam tarts. Plain biscuits such as Digestives, Rich tea, ginger biscuits, jam cream biscuits.
Bombay mix, nuts, seeds, Twiglets.	Pretzels, tortilla chips	Breadsticks, cream crackers, popcorn, corn snacks such as Skips/Wotsits
Chocolate, fudge, caramels. Indian snacks made from condensed milk, nuts or coconut.	Toffee, Liquorice Allsorts, Mars, Twix, KitKat	Marshmallows, Turkish Delight, jelly sweets, mints, boiled sweets.

* Try to eat these foods in small amounts, unless you have a poor appetite or have lost weight recently. Please speak to your dietitian for more advice.

Miscellaneous foods high in phosphate

- Bovril and Marmite are high in both phosphate and salt and should be used sparingly.
- Nut butters, tahini paste and hummus.
- Dried powdered food items such as: cheese-based sauces, dessert mixes, soups, instant pasta dishes, instant noodles, and dried milk.

Miscellaneous foods low in phosphate

- Spices, garlic, herbs, pepper, and condiments such as mustard, tomato ketchup, brown sauce, salad cream, mayonnaise, and vinegar.

Step 3: Take your phosphate binders

You may be prescribed tablets called phosphate binders. These, along with a low phosphate diet, help lower the amount of phosphate in your blood. They work by soaking up some of the phosphate from food in your stomach so it is not absorbed. For these tablets to work properly, it is important to take them with the right foods and at the right time.

Phosphate binders	When to take	How to take
Calcium acetate (Renacet®) 475mg tablet or 950mg tablet  	With meals	Swallow whole
Calcium carbonate (Calcichew®) 0.25g 	Before meals	Suck or chew
Lanthanum (Fosrenol®) Tablets 500mg/750mg/1g sachet 750mg/1g (powder) 	With or immediately after food	Tablet: Chew Sachet: Mix with a small amount of soft food (do not mix with water or other

		liquids)
Sevelamer hydrochloride (Renagel®) 800mg tablets 	With meals	Swallow whole
Sevelamer carbonate (previously Renvela®) 800mg tablets or 2.4g sachets	With meals	Tablet: Swallow whole Sachet: Disperse each sachet in 60ml water

Your phosphate binders are: ……

Tips:

- Take your phosphate binders every time you eat a meal or snack that contains phosphate, such as milk, cheese, eggs, fish, poultry, or meat.
- You do not need to take phosphate binders with low phosphate foods such as bread, plain biscuits, crisps, and fruit.
- Remember to take your phosphate binders with you when you are away from home, for example, when you are on dialysis or eating out. Ask your dietitian for a small tablet pot to carry them easily.
- Do not take phosphate binders at the same time as iron tablets or some antibiotics, as this can stop them from working properly. Ask your pharmacist or doctor for advice.

Warning: Star fruit contains a chemical that can be dangerous for people with kidney problems and should be avoided.

Produced by Coventry Renal Dietitians, University Hospitals Coventry & Warwickshire NHS Trust.

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