



HYPER = High
PHOSPHAT = Phosphate
AEMIA = Blood

Taking charge of your blood phosphate levels

A brochure for patients with chronic kidney disease who have been diagnosed with high phosphate in their blood

 **Shire**

WHY HAVE I BEEN GIVEN THIS BOOKLET?

Your doctor has diagnosed you with high blood phosphate levels, related to your chronic kidney disease.

This booklet is a guide to help you understand:

- **Why you need phosphate**
- **How your body uses phosphate**
- **Why you have high phosphate**
- **Why we need to control it.**

This booklet will also provide you with information on ways to help you control your phosphate levels.



Shire Australia has provided this information as a guide for patients. It is not intended to replace the advice of your health care professional. Should you require further information about hyperphosphataemia, please consult with your doctor.

WHAT IS PHOSPHATE?

Phosphorus is a naturally occurring mineral that is found in food. In the body it is found primarily as phosphate. Along with calcium, phosphate is needed for building strong bones.

Healthy kidneys filter the blood and remove excess phosphate from the body. When your kidneys aren't working well, blood phosphate levels can rise. This build up of excess phosphate is called hyperphosphataemia.

HYPERPHOSPHATAEMIA REFERS TO A HIGH LEVEL OF PHOSPHATE IN YOUR BLOOD

Many patients will not have any symptoms associated with their hyperphosphataemia. However, for some patients, too much phosphate in the blood can make you feel unwell. Symptoms may include:

- itching and/or rash
- fatigue
- anorexia, nausea, vomiting and abdominal pain
- muscle weakness, cramps
- numbness or tingling in the face
- shortness of breath
- sleep disturbances
- bone and joint pain.



Over time, high blood phosphate levels can draw calcium out of the bones, weakening them and causing bone disease. High blood phosphate and calcium levels can also increase parathyroid hormone levels and cause the blood vessels to harden, reducing blood flow.

Lowering your blood phosphate levels may reduce your risk of heart and bone problems.

HOW DO I KEEP MY BLOOD PHOSPHATE LEVEL UNDER CONTROL?



Keeping your blood phosphate levels 'under control' means working with your healthcare team to take any necessary measures to maintain your phosphate at recommended target levels. Your doctor will take your blood as often as monthly (before dialysis) to monitor the level of phosphate in your blood.

In Australia, the recommended blood phosphate levels are:^{1,2}

- <1.5 mmol/L in patients with stage 3 or 4 chronic kidney disease.
- <1.6 mmol/L in patients with stage 5 chronic kidney disease who are on haemodialysis or peritoneal dialysis.

There are a number of things your doctor will discuss with you so you can manage your phosphate level.

These include:

1. The importance of eating a healthy diet that is low in phosphorus, which will help you to reduce your blood phosphate levels
2. Taking phosphate binder medications as directed by your doctor (see **Why do I need a phosphate binder?**)
3. Dialysis to help clean your blood (if you have stage 5 chronic kidney disease).

HOW CAN I REDUCE THE AMOUNT OF PHOSPHORUS IN MY DIET?

The following section presents some general tips that will help you to decrease your phosphorus intake from your diet. Make sure you talk to your renal dietitian and doctor about your specific situation. Your renal dietitian is specially trained to help patients with chronic kidney disease make the best food choices.

Food and fluids with high protein content (e.g. red meat, chicken, fish, eggs and dairy products) are an essential part of a healthy diet, but are high in dietary phosphorus. Limiting the amount of these that you eat and taking phosphate binders with these foods will help to reduce your blood phosphate levels.

Many other foods are also high in phosphorus. It may be necessary to limit the amount of some of these foods for better blood phosphate control.

Processed foods often have higher levels of phosphate additives. These may be added to keep food from drying out (e.g. some fresh and processed meats), improve flavour or colour and to increase shelf life. It is often hard to know what foods may have phosphate additives in them.

To assist in identifying these and other sources of dietary phosphorus, the tables in this booklet have been divided into two groups: **LIMIT** and **BETTER ALTERNATIVES**.

- Foods and fluids to **LIMIT** are particularly high in phosphorus and should generally be avoided.
- **BETTER ALTERNATIVES** are lower in phosphorus or the form of phosphorus is absorbed less; although serving sizes still need to be considered (see **The importance of serving sizes**).

THE IMPORTANCE OF SERVING SIZES

Even if food is low in phosphorus, serving size also plays an important role in the amount of phosphorus you get from foods. For example if you eat lots of small snacks with phosphorus in them, this will add to your blood phosphate levels. Talk to your renal dietitian and doctor for specific advice about number of serves and serving sizes based on your individual needs and limitations.

MEAT, POULTRY, FISH AND ALTERNATIVES

You can choose — serves of meat, poultry, fish or alternatives per day (your renal dietitian will work with you to decide how many serves are right for you).

Remember, these high protein foods are also high in dietary phosphorus. Phosphorus present in legumes and lentils is poorly absorbed by your gut, and may present a better dietary alternative for you – please discuss this option with your renal dietitian.

LIMIT	BETTER ALTERNATIVES
Offal e.g. kidney, brains, tripe and liver	Lean red meat, poultry and pork
Sausages and other processed meats	Eggs (3–4 per week)
Meat pies, sausage rolls	Fresh fish, canned tuna
Fish with edible bones e.g. canned salmon, sardines, anchovies, kippers	Tofu (bean curd)
Fish roe, fish paste, crab, prawns and oysters	Boiled legumes and lentils e.g. borlotti, cannellini, kidney and baked beans
Hard cheese e.g. cheddar, fetta, parmesan	Ricotta or cottage cheese

1 SERVE = 1 SLICE ROAST MEAT / CHICKEN OR 1 EGG OR 20 g COOKED MEAT OR 1/2 CUP OF COOKED LEGUMES

MILK, YOGHURT AND OTHER DAIRY FOODS

Dairy foods are high in dietary phosphorus and hence should be **limited to two (2) serves per day**. Your doctor will work with you to decide if/when you need to take phosphate binders when consuming these foods.

1 SERVE =	100 mL milk (fresh / uht / soy)
	100 mL flavoured milk / milkshake / malted milk
	100 mL cappuccino / café latte / hot chocolate
	100 g yoghurt
	100 mL custard
	2 scoops ice cream
	100 mL white or cheese sauce

FRUIT AND VEGETABLES

The good news is that all fruit and vegetables are low in phosphorus!

However, some types may need to be limited if your potassium levels are high. Ask your renal dietitian for advice about what is right for your individual needs.



BEVERAGES

Please note: for milk-based drinks (such as milkshakes, cappuccinos etc.), check out the recommended number of serves and serving sizes in the milk, yoghurt and dairy foods section.

LIMIT	BETTER ALTERNATIVES
Beer	Water
Cola-based soft drinks	Cordial
	<u>Black</u> tea
	<u>Black</u> coffee (instant, espresso and percolated coffee)
	Wine and spirits (spirits shouldn't be mixed with cola-based soft drinks)

ALCOHOL SHOULD BE CONSUMED IN MODERATION. PLEASE TALK TO YOUR RENAL DIETITIAN FOR A GUIDE ON AMOUNTS.

SPREADS

LIMIT	BETTER ALTERNATIVES
Peanut butter, nut-based spreads	Jam and honey
Brewer's yeast and yeast extracts	Marmalade
	Lemon spread

CEREALS AND GRAINS

LIMIT	BETTER ALTERNATIVES
Brown rice and wholemeal pasta	White rice, noodles, white pasta
Bran-based cereals e.g. bran flakes, whole wheat cereal	Plain breakfast cereals e.g. porridge
Cereal products containing chocolate, or nuts e.g. chocolate puffed rice cereals, muesli	Puffed rice cereal and corn flakes

WHY IS WHITE BETTER THAN BROWN?

Wholegrain foods are higher in dietary phosphorus than white breads or grains. Raising agents like baking powder and yeast increase the amount of phosphorus you absorb. You should discuss with your renal dietitian the number of serves and serving sizes that are right for you.

BREADS

LIMIT	BETTER ALTERNATIVES
Wholemeal/brown, rye and multigrain bread or rolls	White bread and rolls, continental bread
Wholegrain cracker biscuits	Unleavened breads e.g. tortilla, pita
	Muffins, crumpets, croissants
	White cracker biscuits
	Water crackers

SNACKS

Self-raising flour and raising agents like baking powder or yeast increase phosphorus absorption.

LIMIT	BETTER ALTERNATIVES
Cakes, especially chocolate cakes or cakes with chocolate icing	Plain cakes (e.g. orange, madeira, butter) +/- icing
Baked muffins, buns	Jelly
Scones, pancakes and pikelets	Plain biscuits e.g. shortbread, milk coffee
Chocolate coated biscuits	Pieces of fresh fruit
Nuts and seeds	Plain cereal bars e.g. fruit filled
Chocolate or yoghurt covered muesli bars	Vegetable sticks
Chocolate	Pretzels
Cheese flavoured snacks	Home-made popcorn

Please consult with your dietitian about the recommended sugar and salt content of your snacks.

REMEMBER...

High-phosphorus drinks and snacks between meals should be avoided, including milk drinks, cheese, yoghurt, cakes and scones. Choose snacks that are lower in phosphorus, such as plain biscuits, white crumpets or fruit.

Packaged and processed foods often contain phosphate-rich additives. Cooking with fresh produce can help to reduce the amount of phosphorus you consume.

Baking without raising agents (such as yeast, self-raising flour or baking powder) also helps to decrease your phosphorus intake.

Controlling your diet alone (even if you are on dialysis) usually will not keep your blood phosphate levels within a healthy range. This is why phosphate binders are used. Phosphate binders are taken with your food and help to prevent your body from absorbing some of the phosphorus from the food you eat.

The phosphorus in the food interacts with the phosphate binder and is carried through the digestive tract without being absorbed into the blood, and is eliminated in your stool.

People have different levels of phosphate and calcium in their blood. In order to control your phosphate you may require more than one phosphate binder. Your doctor will advise you on which phosphate binders to take to help you to reduce your blood phosphate level.

Remember, you will need to **reduce your dietary phosphorus intake and take your phosphate binder**, as recommended by your doctor and renal dietitian, even if you are also on dialysis.

WHY IS IT IMPORTANT THAT I TAKE MY PHOSPHATE BINDER AND MANAGE MY DIET?

Managing your blood phosphate levels is all about balance; take a moment to weigh up:

- The need to manage your dietary phosphorus intake and take your phosphate binders as recommended by your doctor and renal dietitian.

Against:

- The potential short- and longer-term effects that high levels of blood phosphate can have on your body (see **What is phosphate?** for a list of symptoms that may be caused by your hyperphosphataemia).

YOU are in charge of your phosphate levels. Sticking to your low-phosphorus diet and taking your phosphate binder medications with meals as advised by your doctor will help you to control the amount of phosphate in your blood.

WHAT ARE SOME COMMON TYPES OF PHOSPHATE BINDERS?

There are three common types of phosphate binders:

- Calcium-based phosphate binders
- Calcium-free phosphate binders
- Aluminum-based phosphate binders.

Please refer to the Consumer Medicine Information sheets provided with your medication and discuss with your doctor if you would like more information about the medicines you are prescribed.

CALCIUM-BASED PHOSPHATE BINDERS

Calcium-based phosphate binders bind phosphate from your food and may also be used to add calcium to your diet. Calcium carbonate (e.g. Calcitab[®], Calsup[®]) is one commonly used binder.

CALCIUM-FREE PHOSPHATE BINDERS

Calcium-free phosphate binders such as lanthanum carbonate (Fosrenol[®]), sevelamer hydrochloride (Renagel[®]) and sucroferric oxyhydroxide (Velporo[®]) are used in some chronic kidney disease patients. Your doctor will advise which phosphate binders are right for you.

Alu-tab[®] registered to iNova Pharmaceuticals Australia. Calcitab[®] registered to Intas Pharmaceuticals. Calsup[®] registered to iNova Pharmaceuticals Australia. Fosrenol[®] registered to Shire Australia. Renagel[®] registered to Genzyme Corporation USA. Velporo[®] registered to Fresenius Medical Care Australia.

ALUMINUM-BASED PHOSPHATE BINDERS

Aluminum-based phosphate binders such as aluminium hydroxide (e.g. Alu-tab[®]) may be prescribed when phosphate is poorly controlled.

HOW DO I TAKE MY PHOSPHATE BINDER?

For phosphate binders to work properly, it is essential that they are taken with or immediately after meals and snacks. Your doctor and renal dietitian will tell you how and when you should take your phosphate binders. They will also discuss how many phosphate binders you need to take when you eat.

If you miss a meal then there is usually no need to take your phosphate binders at that time, unless otherwise advised by your doctor or renal dietitian. You should resume taking your phosphate binders with or after your next meal as advised by your doctor.

Talk to your doctor or renal dietitian if you find it difficult to swallow large tablets. Some phosphate binders (but not all) can be chewed or crushed. Speak to your renal pharmacist for specific advice about your phosphate binder medication.

HOW CAN I REDUCE THE AMOUNT OF PHOSPHORUS IN MY DIET?



Remembering to take your medications isn't always easy. Here are a few tips that might help:

- Know which medicines need to be taken with meals and which ones should be taken on an empty stomach.
- Know which medicines may cause side effects when taken alone or if they are taken together. Check with your doctor or pharmacist regarding side effects that may be associated with the medications

you are taking, and always report any side effects you experience when you take your medicines.

- Set a routine. Ask your doctor, nurse or pharmacist if you need help remembering to take your medicines.
- It is very important to take your medicines. You should always talk to your doctor if you have any concerns about your phosphate binders or other medications as they may be able to help.

NAME	PHONE NUMBER	ADDRESS
Doctor		
Renal dietitian		
Renal nurse		
Renal pharmacist		

Acknowledgements



This booklet was developed with editorial support by Anthony Meade, Principal Renal Dietitian at the Royal Adelaide Hospital, and reviewed by renal dietitians. Nutritional analysis was performed with FoodWorks®2009 Professional Edition v 6.0.2539 (Xyris™ Software).

References 1. National Kidney Foundation. K/DOQI Clinical Practice Guidelines for Bone Metabolism and Disease in Chronic Kidney Disease. *Am J Kidney Dis* 2003;42 (suppl 3): S1–S202. 2. Hawley C *et al.* *Nephrology (Carlton)* 2006;11 (suppl 1):S198–S229.

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