

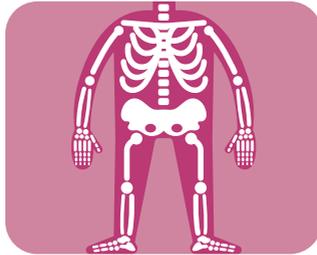
How can chronic kidney disease lead to bone and heart disease?

Information for patients

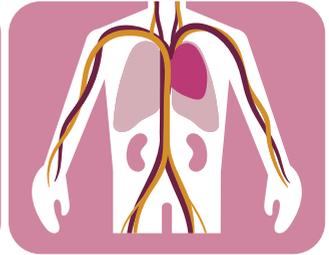


This can occur when the balance of calcium, phosphate, vitamin D and parathyroid hormone (PTH) levels in your blood become difficult to control. This can lead to bone breakdown, hardening of blood vessels and increased risk of heart disease and stroke.

This is known as Chronic Kidney Disease- Mineral Bone Disorder (CKD-MBD)



Bone breakdown



Risk of heart disease and stroke

Why are calcium, phosphate, vitamin D and PTH important and what happens in chronic kidney disease?

Calcium

Calcium is a mineral and together with phosphate provides the main strength and hardness in bones. Calcium is also found in your blood.

Calcium enters your body from food, however the calcium from food does not directly affect your blood calcium level.

The blood calcium level has to be tightly controlled for the body to work properly. Vitamin D and PTH have an important role in this.

We are aiming to help keep your blood calcium level below 2.5mmol/L.

Phosphate

Phosphate is another mineral. As well as keeping bones strong it is also found in muscle and other body tissues.

Phosphate enters your body from food. Any phosphate not needed is filtered out of the kidneys via the urine. In kidney disease this filtering ability no longer occurs effectively and phosphate can build up in the blood. When you have too much phosphate in your blood it can cause the body to pull calcium from your bones. This makes bones weaker, more brittle and more likely to break.

We are aiming to keep your blood phosphate level between 0.8-1.5mmol/L and we will help you get as close to this as you can.

Calcium and phosphate can end up in parts of your body where they do not belong, causing "chalky build ups" in blood vessels. This can lead to hardening of the vessels, heart disease and stroke.

Vitamin D

Healthy kidneys activate vitamin D to a form that helps your body to absorb calcium from your food. When you have kidney disease it is more difficult to produce the activated form. This is an important problem because the body needs the active form of vitamin D to absorb calcium. Blood calcium levels can become too low.

We are aiming to keep your vitamin D to near normal range and we will help you get as close to this as you can.

Parathyroid hormone (PTH)

When the level of phosphate in the blood is high and the levels of vitamin D and calcium are low, the parathyroid glands in your neck make too much parathyroid hormone (PTH).

High PTH levels cause calcium to leave your bones so they become weaker. Some calcium may end up in the heart and blood vessels. This can cause or worsen heart disease.

The aim is to keep your PTH levels in range. Your doctor will agree the most appropriate level for you.

To check your kidney blood results visit www.patientview.org.uk

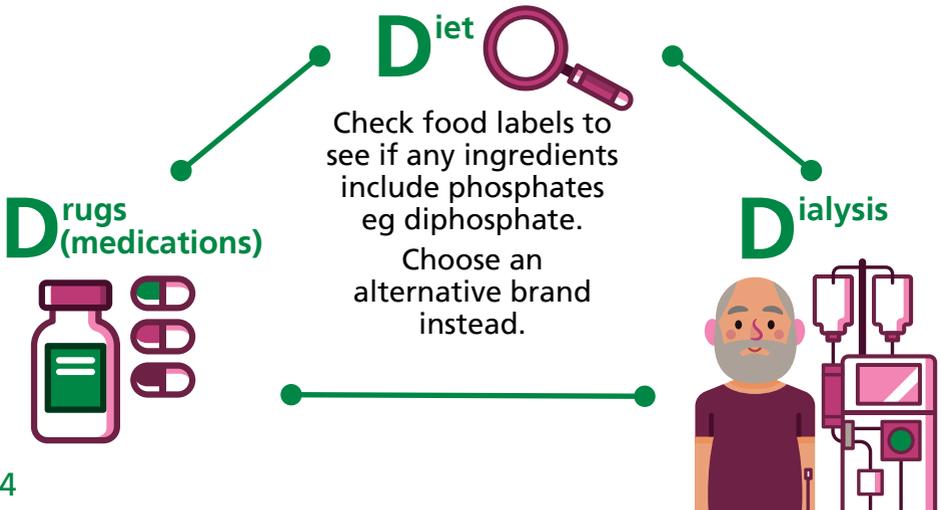
Ask your dietitian or nurse for your blood reading or alternatively join Patient View

www.patientview.org



How is CKD-MBD treated?

You will have regular blood tests that are checked by the renal doctor. Treatment includes low phosphate diet, medication and dialysis. This is often referred to as the '3D's'.



Diet

A low phosphate diet can help to reduce the blood phosphate level.

There are two sources of phosphate in foods; natural sources and added sources known as phosphate additives

Natural sources of phosphate

Phosphate occurs naturally in protein-based foods e.g. meat, poultry, fish, eggs and dairy foods such as milk, cheese and yoghurt. Approximately 40% of phosphate from these sources is absorbed by the body. For some patients reducing these foods may not be appropriate as it may restrict food choices and compromise nutritional status.

Phosphate additives

Phosphate additives are added during the manufacturing of foods e.g. some processed meats, processed cheese, biscuits, cakes, instant sauces and beverages such as cola drinks.

Phosphate additives are almost 100% absorbed by the body.

The renal dietitian can offer individual advice to ensure that your diet is balanced whilst trying to keep your phosphate level in range.

Ask to see the renal dietitian for more information.

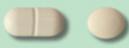
Drugs (medications)

There are several medicines which may be used alone or in combination. These include phosphate binders, vitamin D supplements, Alfacalcidol and Cinacalcet.

Phosphate binders

Phosphate binders reduce the amount of phosphate that moves into the blood from the stomach. After eating, food is digested and phosphate is released into the stomach. Like a sponge soaking up water, the binder soaks up the phosphate in the digestive tract. The phosphate is then removed from your body when you open your bowels. This means that less phosphate is free to move into your blood and helps to stop the phosphate level going too high

There are several types of phosphate binders, some contain calcium and others are calcium- free. The doctor will check your calcium level and prescribe the most suitable one. Some binders have to be swallowed and others have to be chewed. Talk to your renal team if you have a preference.

| Calcium Acetate | Calcium Carbonate | Sevelamer Carbonate | Lanthanum Carbonate | Sucroferric Oxyhydroxide |
|---|---|---|---|---|
|  |  |  |  |  |
| Swallow tablets whole | Chew tablet | Swallow tablet whole (powder form available) | Chew tablet (can be crushed first, powder form available) | Chew tablet (can be crushed first) |

The dose and type of binder prescribed may change depending on your blood levels of calcium and phosphate and your treatment.

For phosphate binders to work properly it is important that they are taken with meals or snacks that contain phosphate.

The renal dietitian can advise on how best to match your prescribed binders to your meal pattern as well as which snacks may require a binder.

How can I remember to take my binders?

Keep them in your cutlery drawer, on your table or where you eat your meals.



Keep a supply in your coat pocket or handbag for when you are away from home.



If you are unable to tolerate your current phosphate binder or are unsure when to take them then **ask to see the dietitian**.



Vitamin D (Colecalciferol)

This may be prescribed if your vitamin D level is low. Increasing the vitamin D level helps to keep your blood PTH level in range which helps to protect your bones.

If you purchase vitamin D supplements over the counter, please let us know what they are and how strong they are.

Alfacalcidol

This is a special activated form of vitamin D. It helps to increase your calcium level and lower the PTH level in your blood. It is taken as a capsule usually once a day in the evening. Sometimes it is prescribed in a bigger dose to be taken once a week or on dialysis.

A common side-effect is that your blood calcium level may go too high. Your blood level will be checked and the dose changed as necessary.

Cinacalcet

Cinacalcet may be prescribed to reduce the amount of PTH in your blood and lower your calcium levels, which will help to protect your bones. Sometimes your doctor may decide to give an injection called Etelcalcetide instead. This is given during haemodialysis.

Dialysis

Dialysis helps to remove some of the phosphate from your blood. Having regular dialysis and completing your dialysis schedule is important to help to prevent phosphate building up in your blood.

Key points - calcium , phosphate, vitamin D and PTH need to be in balance and all have to work together to keep your bones, heart and blood vessels healthy.

Useful websites and reading

www.kidney.org - The National Kidney Foundation provides useful information on kidney disease, treatment and lifestyle.

www.kidneypatientguide.org.uk - Kidney Care UK, offers advice and support for those living with kidney disease. Visit the Kidney Kitchen for recipe ideas

www.beamfeelgood.com - Kidney Beam helps people living with kidney disease to feel good through movement, education and wellbeing support

www.patientview.org - If you want to know your most recent blood levels, why not join PatientView? To see your blood test results, click on the 'I want to join' button, enter your details and select 'renal' speciality

Eating Well for Kidney Health - A practical guide and cookbook. H. Jackson, C. Green & G. James

Please ask your dietitian if you would like recipe ideas.

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