


Chronic Kidney Disease Mineral Bone Disease (CKD-MBD)



Working together for better patient information



Your kidneys do many important jobs such as removing waste and fluid from the body. Once they are damaged your kidneys can't filter blood well. This leads to changes in minerals and hormones which are important to keep bones healthy. This is known as mineral bone disease or CKD-MBD.

Which minerals and hormones are important for my bones?

Our bones are continuously rebuilding to stay healthy. Bones need:

- **Calcium and Phosphate.** These are used to maintain bones. The kidneys are important in keeping blood levels of calcium and phosphate balanced
- **Active Vitamin D (Calcitriol).** Healthy kidneys change vitamin D to an active form. This is important to form new bones and to keep blood calcium levels balanced
- **Parathyroid hormone (PTH)** This is released by the four pea-sized parathyroid glands in your neck to keep calcium levels in your blood stream balanced. When the kidneys are not working properly, this hormone is released to move calcium from your bones into your blood stream

What happens to these minerals and hormones in CKD?

If your kidneys are damaged, they cannot balance the calcium and phosphate levels in your blood. Phosphate increases and this combines with calcium, taking calcium from the bones and causing them to weaken. The combined calcium and phosphate can line blood vessels and lead to blood vessel and heart disease.

Damaged kidneys can't change vitamin D to the active usable form and this can lead to bone weakness.

In kidney disease too much parathyroid hormone is released to keep calcium levels in the blood balanced. By taking calcium from the bones the bones become weaker.

What are the symptoms of mineral bone disease?

Most adults will not have symptoms of mineral bone disease (MBD) until it is advanced. Despite this it is very common and by the time dialysis starts, almost everyone has mineral bone disease.





How can mineral bone disease affect me?

When mineral bone disease is not treated, your bones may become weaker. This can lead to bone and joint pain. It can also increase your chance of breaking bones.

High levels of calcium and phosphate can damage your blood vessels and can line the blood vessels, making them hard like bone. This can lead to heart disease and blood vessel disease.

High phosphate levels can make your skin itchy. Although this is not dangerous, it can be unpleasant.

How do I know if I have CKD-MBD?

Mineral bone disease can be diagnosed by measuring the levels of phosphate, calcium and parathyroid hormone in blood samples.

Your doctor will check these tests on your clinic visits.

How can you treat CKD-MBD?

Treating CKD-MBD can protect your bones and your blood vessels.

The treatment will usually include changes to your diet, taking supplements and medications and making sure that you get the best dialysis when you need it.

Diet

You may be advised to reduce the amount of phosphate you eat. Many processed foods have phosphate additives in them so try to reduce the amount of these foods that you eat. Phosphate additives can be found on the ingredient lists on food labels. Here are some of the most common ones but generally look for the letters “phos”.

E Number	Phosphate Additives
E338	Phosphoric Acid
E339	Sodium phosphates
E340	Potassium phosphates
E341	Calcium phosphates
E343	Magnesium phosphates
E450	Diphosphates
E451	Triphosphates
E452	Polyphosphates
E541	Sodium aluminium phosphates

Other foods containing phosphate include dairy products, bony fish, shellfish, nuts and chocolate.

Drinks such as cola, malted drinks and milky drinks such as Ovaltine and hot chocolate are also high in phosphate.

Reducing your intake of these foods and drinks and choosing low phosphate alternatives will help prevent an increase in phosphate in your blood.

Ask to speak to your kidney dietitian for more information. They can provide you with ideas for low phosphate alternatives to help you adapt and continue to enjoy your diet.



Medications to reduce phosphate levels

Your doctor may prescribe medication to help treat mineral bone disease.

- **Phosphate binders.** These are tablets that you can take to soak up the phosphate in food. This will reduce the amount of phosphate absorbed into the blood stream. You should take your phosphate binders with or just before meals and snacks. Avoid taking iron tablets at the same time and check with your pharmacist or doctor if you are prescribed antibiotics, as the binders can affect how they are absorbed.
- There are different types of phosphate binders. Some need to be chewed while others are swallowed whole, dissolved in water or sprinkled on your food. Your doctor, dietician or pharmacist will discuss which type might suit you.
- Examples of phosphate binders include calcium carbonate e.g. Calcichew[®], calcium acetate e.g. Renacet[®]. sevelamer e.g. Renvela[®], and lanthanum e.g. Fosrenol[®].
- The most common side effects with these tablets are constipation or diarrhoea, feeling sick and a chalky taste in your mouth.
- Vitamin D supplements - your doctor may prescribe an activated form of Vitamin D. This helps to raise the calcium level and lower the PTH in the blood. The most common side effects are a high calcium level and rashes.
- Calcimimetics - your doctor may prescribe another medicine which mimics the effect of calcium on the parathyroid gland. This is called a calcimimetic and the drug is called cinacalcet (Mimpara)[®]. This treatment can protect the bones by reducing the amount of parathyroid hormone.

Dialysis

Dialysis helps to remove phosphate from your blood. Getting the best quality of dialysis for as long as you need can help treat mineral bone disease. However when your diet contains lots of phosphate, even good quality dialysis can't remove all the phosphate from your blood.

Surgery

If diet, medication and dialysis don't help, you may need an operation to remove one or all of your parathyroid glands (parathyroidectomy). After this operation, the levels of calcium may drop and you may need to take extra vitamin D and calcium tablets.

Diet, medication, dialysis and surgery can all help to improve your bone health.



Key points to remember

- Mineral Bone Disease (MBD) is a common problem in people with Chronic Kidney Disease (CKD) and affects almost all patients on dialysis
- MBD leads to weakness in bones and blood vessel disease
- MBD is caused by changes in blood levels of calcium and phosphate and hormonal changes
- MBD can be treated by diet, medications and dialysis
- Sometimes surgery is required in severe cases

Where can I find out more information?


See your kidney dietitian for more information about foods containing phosphate


NHS Choices website www.nhs.uk

Patient View - www.patientview.org - online access to your health records. Ask your renal unit for details about how to join



 www.kidneycareuk.org

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St Mary's Close, Turk Street,
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