

# CALCIUM AND PHOSPHATE BALANCE

## WHY ARE CALCIUM AND PHOSPHATE IMPORTANT?

Calcium and phosphate are two minerals found in your bones providing much of its strength. They keep other parts of your body healthy as well so it is important that they stay at normal levels in the blood.

Calcium is needed for healthy bones and teeth. Most of the cells in the body need calcium to work properly. The body gets calcium from foods and from some other sources. It is then absorbed from the gut. Some goes to the blood cells and what does not get used is passed out as urine. Most calcium is used by the bones with the help of hormones.

Phosphate is found in all the cells in the body and is important for all the jobs they do. It is found in most foods and the body uses it by absorbing it from the gut with help from Vitamin D. In people with chronic kidney disease the only sign of high phosphate levels is itching.

## WHAT ROLE DO THE KIDNEYS PLAY?

The kidneys help to keep calcium and phosphate balanced in the blood by:

- Removing extra phosphate from your blood
- Producing active Vitamin D that is needed for the absorbing calcium from the gut and into the bone.

## HOW DOES CHRONIC KIDNEY DISEASE AFFECT THE BALANCE?

Calcium and phosphate levels in the blood are kept in careful balance by your body's hormones. Chronic kidney disease can upset this balance causing phosphate to rise in the blood and calcium to fall.

This fall triggers your parathyroid glands to release a hormone. The parathyroid glands are made up of four small glands in your neck. The hormone called parathyroid hormone or PTH acts on bone to return calcium to the blood.

As kidney function slowly worsens, calcium removal from bones can cause serious bone disease. Bone weakening can be very slow and there may be no signs of bone strength loss. If ignored, the bones will eventually crack and crumble.

High phosphate and calcium levels can also eventually lead to calcium deposits in your blood vessels, lungs, eyes and heart. Poor control of calcium and phosphate levels increases the risk of cardiovascular disease over time. See 'Heart disease and chronic kidney disease' fact sheet for more information.

## WHAT IS VITAMIN D?

Vitamin D is made from cholesterol and sunlight and can be found in some foods. It is made active by the kidneys. If the kidneys are not working properly, then Vitamin D is not able to work. Vitamin D is important because it is needed to absorb calcium from the gut. It is also needed to put calcium back into the bones and to lower the effect of parathyroid hormone.

Kidney Health Australia would like to thank Genzyme for providing an unrestricted educational grant that supports the development costs associated with this fact sheet

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## HOW DO YOU CHECK THE BALANCE?

It is very important that your calcium and phosphate balance is checked regularly by a blood test and managed so that the risk of developing serious problems is less. Treatment aims to:

- Prevent phosphate levels increasing in the blood
  - Maintain calcium levels
  - Reduce the release of parathyroid hormone
  - Prevent bone disease caused by the loss of calcium.
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## HOW IS THE BALANCE TREATED?

Management of calcium and phosphate levels for people with chronic kidney disease has improved a lot in recent years. Bone pain, fractures, tendon ruptures and many of the other problems can now be prevented.

Reducing the amount of phosphate taken into the body through the gut is one way to stop phosphate levels rising. However phosphate is so common that it is impossible to have a phosphate-free diet. However there may be high phosphate food that is better avoided. Talk to your kidney specialist or dietician for more information.

Often a phosphate-binding tablet is given to lower the amount of phosphate absorbed from food. Phosphate binders are taken with food and act by trapping the phosphate in the gut before it has a chance to move into the blood. The 'bound' phosphate leaves the body by the bowel into the toilet. There are several types of phosphate binders.

Most phosphate binders in Australia have calcium in them. High calcium levels may mean that your doctor starts you on different types of phosphate binders. Newer phosphate binders do not have calcium in them. Talk to your health care team about the best type of phosphate binder for you.

Your doctor may also prescribe calcitriol, which is active Vitamin D. It helps to absorb calcium into the blood from the gut.

There are also newer types of medications called 'calcimimetics' that help lower levels of parathyroid hormone, calcium and phosphate for people with severe problems. This class of medication is expensive in Australia and research is on going.

If you are on dialysis, your healthcare team may also adjust the length of time of dialysis as well as the dialysate levels to help bring your calcium and phosphate levels into balance. A form of haemodialysis called 'nocturnal haemodialysis' can help to bring the balance back to normal. See 'haemodialysis' and 'home haemodialysis' fact sheets for more information.

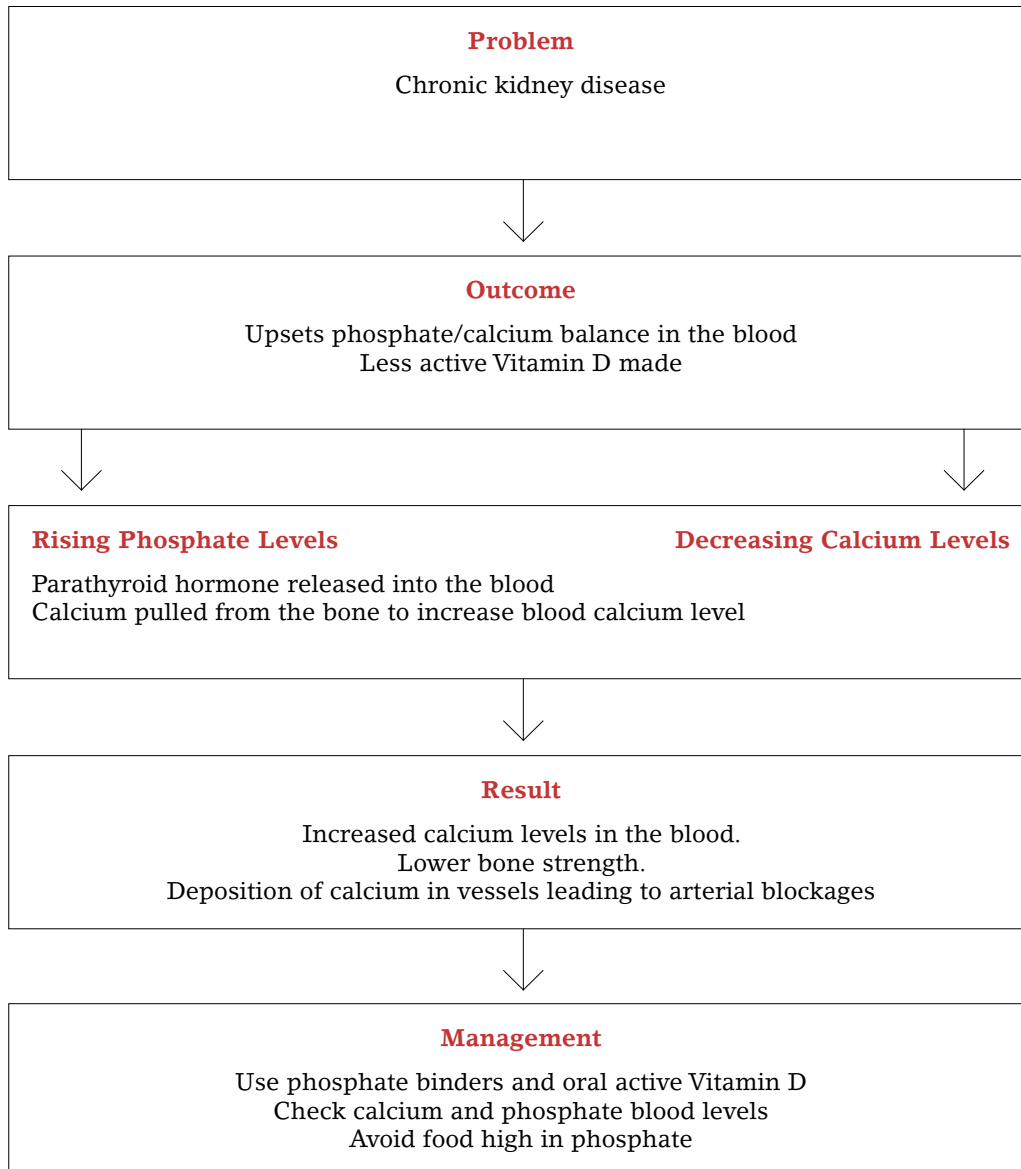
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## WHAT IS PARATHYROID SURGERY?

Some people may need surgery to remove their parathyroid glands as part of their treatment. This is surgery that will remove the small glands. They are located in the throat. Surgery may be required to help control the high phosphate and parathyroid levels.

You may feel worried about having this surgery. It is important to talk to your health care team about it if you are concerned or have any questions. See 'Making the most of your visit to the doctor' fact sheet for more information.

## SUMMARY



For more information about kidneys health or this topic, please contact the Kidney Health Australia: Kidney Information Line (free call) on **1800 682 531** or visit website [www.kidney.org.au](http://www.kidney.org.au)

This is intended as a general introduction to this topic and is not meant to substitute for your doctor's or Health Professional's advice. All care is taken to ensure that the information is relevant to the reader and applicable to each state in Australia. It should be noted that Kidney Health Australia recognises that each person's experience is individual and that variations do occur in treatment and management due to personal circumstances, the health professional and the state one lives in. Should you require further information always consult your doctor or health professional.

The information provided in this fact sheet has been independently developed based on the most current evidence at the time. We would like to thank Genzyme for providing an unrestricted educational grant that supports the development costs associated with this fact sheet.

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