

Bone Disease and Chronic Kidney Disease



Bone Disease and Chronic Kidney Disease

People with Chronic Kidney Disease (CKD) often have problems with the mineral balance in their body. As your kidney function drops, this can affect your mineral balance, bones and other parts of your body. Your bones may become weak, cause pain and break more easily. Mineral imbalances may lead to calcium deposits (calcification) in blood vessels and soft tissues.

The good news is that there are ways of treating, minimizing and preventing mineral and bone disease and its effects.

What Causes Mineral and Bone Disease Associated with CKD?

Your doctor will find out which disorders you may have by examining you and ordering blood tests. The most common disorders are when your phosphorus, calcium, pH and parathyroid hormone (PTH) levels aren't properly balanced. This can happen for many reasons, including:

Model(s) are a depiction of people with kidney disease and bone disease.



Phosphorus Levels Are Too High

Phosphorus is a mineral which helps keep your bones strong and healthy. As kidney function declines, your blood phosphate level may rise, causing itchy skin or painful joints, and loss of calcium from your bones. One way to prevent phosphorus from building up in your blood is to eat foods that are low in phosphorus. A renal dietitian can help you with a low phosphorous diet.

Your doctor may also prescribe phosphate binders. These medications are taken with meals. They bind the phosphate in your food and keep it from being absorbed. Dialysis only removes a small amount of phosphate from the blood. More dialysis can help.

Parathyroid (PTH) Glands Are Too Active

As phosphorus levels in your body increase, calcium levels in your blood tend to drop. The combination of high phosphate and low calcium causes the parathyroid glands (four small glands in your neck) to become overactive and release too much hormone. When this happens over a long period of time it may cause your bones to weaken and make them more likely to break. You may also find that you have bone pain.

This problem may be avoided through changes in your dialysis treatments, eating foods that are low in phosphorus, and by taking medications to decrease PTH levels. Sometimes surgery is needed to remove some of these PTH glands (parathyroidectomy).

Your Body Can't Use Vitamin D Effectively

Vitamin D is important to healthy bones. Vitamin D affects your calcium balance and may improve your bone strength. Sources of vitamin D include sunlight, certain foods, and vitamin and mineral supplements.

Normally, your kidneys convert vitamin D into an active form that your body can use. When your kidneys aren't working well, they can no longer do this important job. Fortunately, active forms of vitamin D are available as a medication. These active forms of vitamin D are part of the treatment to avoid ongoing high levels of parathyroid hormone. Your doctor can prescribe them if you need them.

Your Body Accumulates Too Much Acid

Your kidneys have an important role in maintaining the acid balance in your body. When your kidneys can't remove the acid, it may build up in the body. This acid build-up may affect bone health by

removing minerals out of the bone. This will lead to lower bone strength. Use of bicarbonate and adequate dialysis is needed to keep acid and base in the right balance.

What Are Some of the Treatments?

Your treatment may include one or more of the following:

- Reducing the amount of phosphorus you eat. A renal dietitian can provide helpful advice.
- Taking medications called phosphate binders (often calcium tablets).
- Taking medication with the active form of vitamin D. Sometimes your doctor may prescribe a non-active form of vitamin D.
- Taking medication to decrease your PTH level.
- Changes in your dialysis treatment.
- An exercise program approved by your doctor.
- An operation to remove some of your parathyroid glands.

How Can I Prevent or Minimize the Effects of Bone Disease?

Make Healthy Food Choices

Your kidney team may recommend that you reduce your phosphorus intake. Foods high in phosphorus include dairy products like milk and cheese, nuts and seeds, and phosphate additives. **Phosphate additives** are extremely well absorbed and have the biggest impact on your bone health. Anyone with kidney disease should **avoid** foods with phosphate additives. They are found in processed meats, processed cheeses, and some frozen or prepared meats that are labelled “seasoned”. Check the ingredients lists and avoid foods with ingredients such as:

- Sodium **phosphate**
- Calcium **phosphate**
- **Phosphoric acid**
- Hexamet**phosphate**

Your renal dietitian will help you make a healthy eating plan to reduce phosphorus and maintain good overall nutrition.

Exercise

Many people with CKD have found that an exercise program helps increase strength and energy. In some people, exercise may help to strengthen bones. Ask your doctor about an exercise program that is right for you.

Use Medications as Recommended

In order to prevent and treat bone disease, it's important that you take your phosphate binders, active vitamin D, and any other medications as they are prescribed.

Will a Kidney Transplant Help My Bones?

A successful kidney transplant may help your bones to heal by rebalancing the mineral levels in your body. But, the cortisone-like medication taken by kidney transplant recipients may reduce bone strength. Your doctor will carefully monitor how your bones are doing after a kidney transplant and may give you medication to prevent bone mass loss.



OUR VISION

The Kidney Foundation of Canada is committed to achieving excellent kidney health, optimal quality of life, and a cure for kidney disease.

OUR MISSION

The Kidney Foundation of Canada is the national volunteer organization committed to eliminating the burden of kidney disease through:

- Funding and stimulating innovative research for better treatments and a cure;
- Providing education and support to prevent kidney disease in those at risk and empower those with kidney disease to optimize their health status;
- Advocating for improved access to high quality healthcare;
- Increasing public awareness and commitment to advancing kidney health and organ donation.

For further information, or to help us in our efforts, please contact The Kidney Foundation office in your area. You can also visit our website at kidney.ca.

The Kidney Foundation would like to acknowledge and thank the members of the Kidney Foundation's National Programs & Public Policy committee for their contributions and professional expertise in the development of this resource, and specifically, Fabrice Mac-Way, MD, Clinician-Scientist at CHU de Québec-Université Laval.

This material is available in accessible formats upon request by contacting info@kidney.ca or calling 1-800-361-7494.