

NEPHROLOGY ASSOCIATES OF MICHIGAN

UNDERSTANDING KIDNEY BONE DISEASE

Chronic kidney disease can affect your heart, blood vessels, blood count (Anemia), and your bones.

Bone problems can develop in the early stages of kidney disease and result from vitamin D deficiency, excess parathyroid hormone and imbalances of calcium and phosphorus.

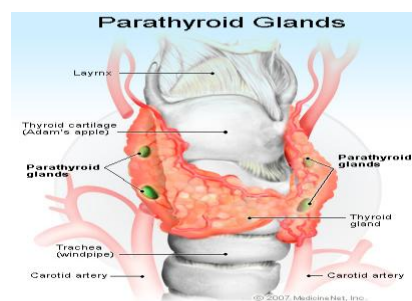
Vitamin D helps to regulate calcium and phosphorus levels in your blood and is needed for healthy bones. Low levels of vitamin D can lead to low calcium levels, elevated phosphorus level and parathyroid hormone (PTH) abnormalities. Vitamin D levels are affected by sunlight. The kidney converts vitamin D to an active form the body can use. Depending on the level of these substances your doctor may prescribe a form of nutritional vitamin D, or an active form from the kidney.

Phosphorus is a mineral that is needed for healthy bones and comes from the food you eat. Although your body needs phosphorus, too much is harmful to your bones and blood vessels. One of the jobs of your kidneys is to remove excess phosphorus from your blood. Reduced kidney function results in elevated phosphorus. This can lead to weak bones as well as a buildup of calcium and phosphorus. This build-up can lead to many health problems.

Calcium is a mineral that is important for strong bones, muscle and nervous system activity. Not enough calcium will lead to weak bones, fractures, cramps or an irregular heartbeat. Too much calcium will lead to constipation, confusion and calcium deposits in your skin and blood vessels. Calcium deposits can lead to heart problems and calciphylaxis.

Parathyroid Hormone (PTH) is a hormone made by the parathyroid glands. These tiny glands are located next to your thyroid gland in the base of your neck. Imbalances in calcium, vitamin D and phosphorus cause the parathyroid glands to work harder leading to overproduction of the PTH hormone and enlargement of the glands. This condition is called **secondary hyperparathyroidism**. High PTH hormone levels steal calcium from your bones resulting in soft, weak bones .

Kidney bone disease leads to fractures and increases your risk of a heart attack and stroke.



Now that you know this you may be asking yourself, what can be done to keep my bones healthy and strong and reduce my risk of heart and blood vessel disease?

The 5 most important things you can do to maintain healthy bones and reduce your risk of heart disease and stroke when you have chronic kidney disease are:

1. Keep phosphorus, calcium and PTH and Vitamin D levels under control.

Normal levels are as follows:

CKD Stage	Stage 3	Stage 4	Stage 5
Calcium	8.4 to 9.5	8.4 to 9.5	8.4 to 9.5
Phosphorus	2.7 to 4.6	2.7 to 4.6	3.5 to 5.5
PTH	30 to 70	71 to 110	150 to 300
Vitamin D (inactive)	30 to 50	30 to 50	30 to 50

2. Follow a low phosphorus diet if you are asked to do this by your doctor. Common foods to avoid include colas, dairy products (cheese, ice-cream, and milk), nuts, peanut butter, and dried beans. See your doctor for a list of high phosphorus foods to avoid.
3. You may be asked to take a medication we call binders when you eat your meals. Binders taken during a meal reduce phosphorus absorption from your food into your blood stream. Excess phosphorus is absorbed like a sponge and eliminated from your body through your stool. Renvela, Phoslo, Renagel, and Fosrenal are binders that may be prescribed for you. They should be taken with meals or snacks. Common side effects include a gassy stomach and change in bowel s. Take your binders regularly for best results.
4. To control PTH levels you may be asked to take one or both forms vitamin D. Medications such as over the counter Vitamin D or Ergocalciferol (prescription required) are “inactive” forms of vitamin D. “Active” forms of Vitamin D include Rocaltrol, Calcitriol, Zemplar, or Hectoral. These medications require a prescription. Vitamin D can cause high calcium levels and should only be taken as prescribed by your physician.
5. To help maintain normal calcium levels avoid use of over the counter calcium products unless your doctor tells you to take them. Be aware that “Tums” and other calcium supplements can cause high calcium levels and should only be taken by doctor’s advice if you have chronic kidney disease.
6. In some cases, you may be asked to take a medication called Sensipar to control your PTH level. This medication lowers both your PTH and calcium level.
7. **DINING OUT-** Every one needs a break from cooking once in a while, or eat out with friends. **When you are away from home**, remember to plan ahead and take your binders with you. Pick up a container such as pill box for binder storage and slip it into your purse or pocket for easy reach. **DO NOT USE A CANDY BOX AS A CHILD MAY THINK THEY ARE CANDY.**

