

# Kidney Disease and Phosphorus

## What is phosphorus, and why is it important?

Phosphorus [FOS-fur-us], or phosphate [FOS-fayt], is a mineral found in most foods. At the right level in your body, phosphorus works together with calcium to keep your bones and teeth strong. It also helps your nerves and muscles work properly.

## How does kidney disease affect phosphorus?

Kidney disease can cause too much phosphorus to build up in your blood. Healthy kidneys keep phosphorus at the right level in your body. They help get rid of the extra phosphorus you get from your food and release it into your urine (pee).

## What happens if I have too much phosphorus in my blood?

Too much phosphorus can cause serious problems, such as:

- **Your bones can become weak and may easily break.** To balance out the extra phosphorus, your body makes a special hormone. This hormone causes calcium to be pulled from your bones and stick to the extra phosphorus. With less calcium in your bones, they become weaker.
- **Hardened deposits can form in your heart, blood vessels, joints, or lungs.** Extra phosphorus can attach to calcium and be deposited in various areas of your body. These deposits, called calcifications [kal-suh-fi-KAY-shuns], can cause serious health problems.
- **You can have uncomfortable symptoms** like red eyes, itchy skin, and painful or stiff joints.
- **Your kidney disease can progress more quickly**, eventually leading to kidney failure.

## How can I manage phosphorus?

You can help manage your phosphorus levels by:

- **Limiting high-phosphorus foods in your diet.** Use the information on [page 2](#) to identify and avoid high-phosphorus foods. Work with your dietitian to keep the phosphorus in your diet below 1,000 milligrams (mg) each day.
- **Avoiding foods with added phosphorus.** Many packaged foods have additives containing phosphorus (or phosphate). (See the information on [page 2](#) about reading an ingredients list.) Examples of packaged foods where you might find added phosphorus include:
  - **Cake mixes** (may contain sodium acid pyrophosphate 28 or monocalcium phosphate)
  - **Colas** (contain phosphoric acid)
  - **Drink mixes and orange juice** (may contain tricalcium phosphate)
  - **Packaged or canned meats or shrimp** (contain tripolyphosphate)
  - **Pasta** (may contain disodium phosphate)
- **Taking an over-the-counter medication called a “phosphate binder,”** such as Tums, if directed by your healthcare provider. Phosphate binders stick to phosphorus while it’s in your stomach so it can’t be absorbed into your body. When taking a phosphate binder medication:
  - **Take it with every meal and snack**, especially with foods that have added phosphorus.
  - **Don’t “double-up” if you miss a dose.** Just take the normal amount at the next meal.
  - **Keep your medication handy** at the dinner table and in a pill case for when you eat out.
- **Taking other medications as prescribed.** Your doctor may prescribe medication to help your body balance phosphorus, calcium, and hormones.

## Different kinds of phosphorus

Not all phosphorus is created equal and it's important to know the difference. The food and drinks you consume either contain organic phosphorus or inorganic phosphorus.

### Organic phosphorus

Naturally-occurring phosphorus is found in some foods and is called **organic phosphorus**. Our bodies only absorb about half of the organic phosphorus we get in our diets.

Common sources of organic phosphorus include cheese, eggs, chocolate milk, cottage cheese, cream, ice cream, yogurt, bran bread, cereal or muffins, beans, nuts and seeds, peanut butter, chocolate, and beer. Meats like beef, fish, poultry, and pork are also common sources of organic phosphorus.

**Natural (organic) sources of phosphorus can be kept in the diet at moderate levels. They often provide other important nutrients too.**

### Fruits and vegetables

Almost all fruits and vegetables contain low amounts of organic phosphorus. But they may contain potassium, another mineral. If you also need to limit the amount of potassium you get in your diet, see the Intermountain fact sheet **Kidney Disease and Potassium** for more information, including a list of low-potassium fruits and vegetables.

### Inorganic phosphorus

Phosphorus added to foods is called **inorganic phosphorus**. It's added for different reasons, such as to improve color, flavor, and/or stability of the food. Our bodies absorb most of the inorganic phosphorus we get in our diets.

Foods that have high inorganic (added) phosphorus include dark sodas (cola), lunch meat, deli meat, sausage, hot dogs, bologna, fast food, frozen meals, pre-made bakery items, cake mixes, drink mixes, and powdered or canned soups.

**Inorganic phosphorus can be the most damaging to your health. To check for inorganic phosphorus in foods you eat, you'll need to read the ingredients list (see below).**

### How to find added phosphorus in foods

To find added phosphorus in packaged foods, check the ingredients list for any words containing "phos," such as "phosphate" or "phosphoric." An example is in the box below. The red circle indicates the phosphorus ingredient.

**Ingredients: Whole Grain Corn, Sugar, Whole Grain Oats, Brown Sugar Syrup, Corn Syrup, Canola and / or Rice Bran Oil, Salt, Dried Corn Syrup, Banana Puree, Corn Bran, Corn Starch, Trisodium Phosphate, Color Added, Sodium Citrate, Natural Flavor, Natural Almond Flavor. Vitamin E (mixed tocopherols) and BHT Added to Preserve Freshness.**

## Help from a Registered Dietitian Nutritionist

Talk with your doctor about seeing a Registered Dietitian Nutritionist (RDN) to help manage your phosphorus levels. If you have kidney disease, you will have regular blood tests to check your phosphorus levels. In early-stage kidney disease, your phosphorus levels should be below 4.6 mg/dL and in advanced kidney disease, it should be below 5.5 mg/dL. Dialysis removes a little phosphorus, but you will need to manage your phosphorus through diet and/or medications. To learn more about managing your phosphorus levels, and to contact an RDN, visit <https://intermountainhealthcare.org/services/nutrition-services/>.

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