

Kidney Disease and Phosphorus

What is phosphorus and why is it important?

Phosphorus (or **phosphate**) is a mineral found in most foods. At the correct level in your body, phosphorus works together with calcium to keep your bones and teeth strong and help your nerves and muscles work properly.

How does kidney disease affect phosphorus?

Healthy kidneys control how much phosphorus from your food is excreted out of your body. In this way, healthy kidneys keep phosphorus at the right level.

Unfortunately, with kidney disease, too much phosphorus can build up in your blood.

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

Too much phosphorus can cause serious problems:

- **Your bones can become weak and easily broken.** To balance out the extra phosphorus, your body makes a special hormone. This hormone causes calcium to be pulled from your bones, so it can bind with the extra phosphorus. With less calcium, your bones are weaker.
- **Hardened deposits can form in your heart, blood vessels, joints, or lungs.** Extra phosphorus can join with calcium to make bony bits (called **calcifications**). These are deposited in various areas of your body, and can cause serious health problems.



If you have kidney disease, you'll have regular blood tests for phosphorus levels.

- In **early-stage kidney disease**, it should be **below 4.6 mg/dL**.
- In **advanced kidney disease**, it should be **below 5.5 mg/dL**. Dialysis removes some phosphorus, but you'll also need to manage your phosphorus through diet and/or medications.

- **You can have uncomfortable symptoms**, such as 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?

- **Limit high-phosphorus foods in your diet, and avoid phosphate-based food additives.** See page 2.
- **If directed by your doctor, take an over-the-counter phosphate binder, such as Tums, with meals and snacks.** Phosphate binders combine with phosphorus while it's in your stomach, so it can't be absorbed into your body. For tips on taking them, see page 2.
- **Take other medications as prescribed.** Your doctor may prescribe medication to help your body balance phosphorus, calcium, and hormones.



Help from a registered dietitian (RD)

Talk with your doctor about whether seeing a registered dietitian would be helpful for you. A registered dietitian can help you create an eating plan based on your diet restrictions and what you like to eat. Help from an RD may be especially useful if you're on several dietary restrictions.

To learn more and contact an RD, visit intermountainhealthcare.org/nutrition

Phosphorus in foods

Category	Very high phosphorus (AVOID these)	High phosphorus (Watch portion sizes)	Low phosphorus alternatives (Choose these instead)
Dairy and dairy substitutes	<ul style="list-style-type: none"> • Cheese • Chocolate milk • Cottage cheese • Cream • Ice cream • Foods made with milk: cream soups, sauces, etc. • Yogurt or frozen yogurt 	<ul style="list-style-type: none"> • Milk (limit to 1 cup per day) • Soy milk (1 cup) 	<ul style="list-style-type: none"> • Cream cheese (1 ounce) • Nondairy milk substitute or creamer (1 Tbsp) • Sour cream (¼ cup) • Unenriched rice milk (avoid enriched rice milk — it has phosphate added) • Foods made with unenriched rice milk: cream soups, sauces, etc.
Breads and grains	<ul style="list-style-type: none"> • Bran bread, cereal, or muffins • Quick-cooking rice and pasta (i.e., Minute rice, Top Ramen, Cup o Noodles, Easy Mac) 	<ul style="list-style-type: none"> • Bread, crackers, noodles, pasta, or tortillas <i>made with whole wheat flour</i> • Brown rice (½ cup) • Oatmeal (½ cup) • Wheat germ (1 Tbsp) 	<ul style="list-style-type: none"> • Bread, crackers, noodles, pasta, or tortillas <i>made with white flour</i> • Corn or rice cereal, hot cereal such as cream of wheat or cream of rice • Popcorn (unsalted)
Meats and other proteins	<ul style="list-style-type: none"> • Beans (dried or canned) • Bologna, hot dogs, processed meats • Liver and other organ meats • Nuts and seeds • Peanut butter 	<ul style="list-style-type: none"> • Beef (3 ounces) • Eggs (2 eggs) • Fish (3 ounces) • Poultry (3 ounces) • Pork (3 ounces) 	<p>Tip: Foods with whole-grain flour are higher in phosphate than foods with white flour, but whole grains are part of a heart-healthy diet. Just limit whole-grain foods to around 4 servings a day.</p>
Sweets and desserts	<ul style="list-style-type: none"> • Chocolate • Cakes, cookies, puddings, or pies made with milk or chocolate • Ice cream 	<ul style="list-style-type: none"> • Cakes, cookies, puddings, or pies made with no milk or chocolate (but can contain nuts) — stick to a small serving 	
Drinks	<ul style="list-style-type: none"> • Beer and ale • Cocoa • Colas 		<ul style="list-style-type: none"> • Coffee and tea • Non-cola sodas • Juices and lemonade

What about fruits and vegetables? All fruits and vegetables are low in phosphorus. However, they often contain potassium. If you have potassium restrictions, see the fact sheet *Kidney Disease and Potassium* for more information.

Food additives — hidden phosphorus

Many packaged foods have additives with phosphorus. Read the ingredients list. Watch out for ingredients that contain **phosphate** or **phosphoric**. Examples of packaged foods where you might find added phosphorus:

- Cake mixes: sodium acid pyrophosphate 28, monocalcium phosphate
- Colas: phosphoric acid
- Drink mixes and orange juice: tricalcium phosphate
- Packaged or canned meats or shrimp: tripolyphosphate
- Pasta products: disodium phosphate

Taking phosphate binders

- **Follow your doctor's directions.** Take your phosphate binder with every meal and snack, especially those with meat/protein, dairy products, or whole grains.
- **If you forget your binder, don't double the dose next time.** Just take the normal amount with your next meal.
- **Keep your binder handy.** It helps to keep the medication bottle at the dinner table. Also, carry some in a pill case so it's handy when you eat out.