

WHAT IS PHOSPHORUS AND WHY IS IT IMPORTANT?

(ADAPTED FOR CHINESE TRANSLATION)

Phosphorus is a mineral. It is found in milk products, meat, poultry, fish, legumes (dried peas, beans and lentils), nuts, seeds, and whole grains. It is also used as an additive in many processed foods and drinks.

Phosphorus and calcium work together to keep your bones and teeth strong. Healthy kidneys remove extra phosphorus from your body.

When you have kidney disease, the phosphorus from your diet may build up in your blood. Over time, high phosphorus levels cause calcium to be taken out of your bones and bones can become weak and break easily. Calcium and phosphorus can form crystals in your skin, blood vessels, heart, lungs, brain and eyes. This can cause itch, joint pain, hardening of the arteries and damage to muscles and organs.

Dialysis removes some phosphorus from your body, but not as much as healthy kidneys do.

How Can I Control My Phosphorus?

- **Diet:** Eat a diet that is lower in phosphorus. Ask your dietitian to review your diet with you.
- **Phosphorus binders:** Your doctor may prescribe phosphorus binders such as calcium carbonate (Tums™, Apocal™), calcium acetate, Renagel™ or Fosrenol™ to be taken with meals, snacks, and nutritional supplements such as Ensure Plus™, Nepro™, and Glucerna™.
- **Dialysis:** If you are on hemodialysis, do not miss or shorten your dialysis treatments. If you are on peritoneal dialysis, follow your prescribed dialysis schedule.

HOW DO I EAT LESS PHOSPHORUS?

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Limit or avoid high phosphorus foods:

- **Products containing phosphorus additives.** Check food labels for ingredients containing “phos” as part of a word (e.g. *phosphoric acid*).
- **Regular and diet colas, beer, and some root beers/iced teas**
- **Processed cheeses** such as cheese slices, Velveeta™, Cheez Whiz™
- **Evaporated or condensed milk, non-dairy creamer**, such as Coffee Rich™, International Delight™
- **Chocolate** such as chocolate bars, chocolate milk, hot chocolate, chocolate candies and chocolate syrup
- **Chocolate and malt beverages** such as Milo®, Ovaltine®, and Horlicks®
- **Organ meats** such as liver, sweetbreads, brain, kidney
- **Edible bones in fish** such as bones found in sardines or canned salmon
- **Nuts and seeds**, including nut butters
- **High fibre cereals** such as All-Bran™, All-Bran Buds™, Red River™, and granola-type cereals

- **Bran muffins**
- **Dark rye or pumpernickel breads**

Phosphorus absorption is affected by:

1. The amount of phosphorus in food
2. Presence of phosphate binders
3. Bioavailability (ability to digest and absorb) of the phosphorus in that food

Whole grains, nuts, and seeds contain phosphorus but it is harder for the body to digest and absorb it. These high-fibre, heart healthy foods help control diabetes, lower cholesterol, and help with weight management. Ask your dietitian how to include these foods in your diet.



Dairy products such as milk, yogurt, and cheese contain phosphorus but are important sources of calcium, vitamin D, and protein.

Ask your dietitian how to include these foods in your diet.



HIDDEN SOURCES OF PHOSPHORUS

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Phosphorus can be an additive in many processed foods and drinks. Unlike naturally occurring phosphorus, the phosphorus from additives is almost completely absorbed by your body. You should **limit** foods naturally high in PO₄ and **avoid** foods with PO₄ additives. The most common products containing phosphorus additives are:

- processed meats such as chicken nuggets, bologna and hot dogs
- refrigerator biscuits, pastries, cookie doughs
- processed cheeses
- instant puddings and sauces
- pancake and waffle mixes
- cold cereals and instant hot cereals
- many types of drinks
- many fast food restaurant items
- enhanced meats, often labeled “seasoned” (fresh or frozen meats that are injected with sodium phosphate solutions to make them more tender and flavorful)

One third of the phosphorus in our food is from additives. Cooking fresh is the best way to avoid unwanted additives.



Learn to read food labels and look at the ingredient list.

Manufacturers change the ingredients in products, so it is important to check labels often. Avoid foods containing phosphorus additives. Look for “phos” anywhere in the ingredient list:

Coca Cola Classic™ - ingredients: carbonated water, sugar/glucose-fructose, caramel color, **phosphoric acid**, natural flavors, caffeine.

Aunt Jemima Original Pancake and Waffle Mix™ -ingredients: wheat flour, corn flour, sugar, monocalcium **phosphate**, sodium bicarbonate, salt, dextrose, artificial flavor.

High Liner Frozen Cod Fish Fillets™ - ingredients: cod, water, sodium **phosphate**

HIGH PHOSPHORUS VS. LOWER PHOSPHORUS FOOD CHOICES (ADAPTED FOR CHINESE TRANSLATION)

How Do I Eat Less Phosphorus?

- Limit high phosphorus foods to _____ serving(s) per day/week.
- Ask your dietitian how to fit high phosphorus foods in your diet.

Meat, poultry and fish, and eggs also contain phosphorus but are excellent sources of protein and need to be eaten daily. Ask your dietitian how to include these foods in your diet.



**A low phosphorus diet contains
800-1000mg PO₄.**

High Phosphorus Foods (100- 140 mg phosphorus /serving)	Serving Size
Cow's milk	1/2 cup
Soy milk	3/4 cup
Chocolate milk / Hot chocolate	1/2 cup
Yogurt (plain or fruit)	1/2 cup
Ice cream	3/4 cup
Pudding or custard	1/2 cup
Cheese (hard, natural)	1 oz (1"cube)
Cottage cheese (1/3 cup = 330mg sodium)	1/3 cup
Sardines	2
Liver and organ meats	1 oz
Nuts	3 tbsp
Seeds (pumpkin, sunflower)	1 tbsp
Bran flakes cereal	1 cup
All Bran™ cereal	3 tbsp
Bran muffin	1 medium
Dried beans (kidney, white, garbanzo)	1/2 cup
Soy beans (cooked)	1/4 cup
Lentils, boiled	1/3 cup
Peanut butter	2 tbsp

HIGH PHOSPHORUS VS. LOWER PHOSPHORUS FOOD CHOICES (ADAPTED FOR CHINESE TRANSLATION)

HIGH Phosphorus Food Choice	LOWER Phosphorus Food Choice	HIGH Phosphorus Food Choice	LOWER Phosphorus Food Choice
<p>Processed meat</p> 	<p>Fresh meat</p> 	<p>Processed cheese</p> 	<p>Cream or hard cheese</p> 
<p>Canned salmon or sardines (with bones)</p> 	<p>Canned tuna</p> 	<p>Ice cream</p> 	<p>Popsicle</p> 
<p>Nuts and seeds</p> 	<p>Plain crackers</p> 	<p>Dairy products, non-dairy creamer, soy milk</p> 	<p>Almond milk, Rice Dream Original™</p> 
<p>Peanut/nut butter</p> 	<p>Jam, jelly, honey</p> 	<p>Cola, root beer, ice tea</p> 	<p>Clear soda, sparkling water, salt-free club soda</p> 
<p>Bran cereal</p> 	<p>Corn, rice, wheat cereal</p> 	<p>Hot chocolate, Milo®, Ovaltine®, and Horlicks®</p> 	<p>Chinese/Green tea</p> 
<p>Muffin</p> 	<p>Bagel, croissant or donut</p> 	<p>Chocolate bar</p> 	<p>Hard candy, gummy candy</p> 
<p>Dark rye, pumpernickel bread</p> 	<p>Whole wheat, light rye or white bread</p> 	<p>Pizza, alfredo pasta</p> 	<p>Pasta with garlic, basil & olive oil, rice, plain noodles</p> 

PHOSPHORUS BINDERS

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- Phosphorus binders are also called “phosphate binders” or “binders”.
- Your doctor may prescribe binders such as calcium carbonate (Tums™, Apocal™), calcium acetate, Renagel™, Fosrenol™ or Amphogel™.
- Binders hold on to some of the phosphorus from food so that it does not enter your blood stream. Like a sponge soaks up water, binders hold onto the phosphorus and prevent some of it from being absorbed into your blood. The phosphorus is passed out of your body in your stool, helping keep your phosphorus levels normal.
- Take the correct number of binders with each meal and/or snack as directed by your doctor, dietitian, or pharmacist.
- Binders should be taken right before the first bite of food. If you forget to take your binder before your meal, you can take it during your meal or up to 30 minutes after you eat.
- Remember to take your binders with you when you eat out and when you

travel. Keep some in your purse, car, or at your office in case you forget to bring them with you.

- Do not take your binders at the same time as your iron pills, as they decrease the amount of iron your body can absorb.

Tell a member of your health care team if ...

- you don't like the taste of the binders
- they are difficult to chew or swallow
- your binders cause constipation
- you take extra Tums™ for heartburn
- it is hard to remember to take your binders




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