

Preventing Kidney Stones



THE OHIO STATE
UNIVERSITY

WEXNER MEDICAL CENTER

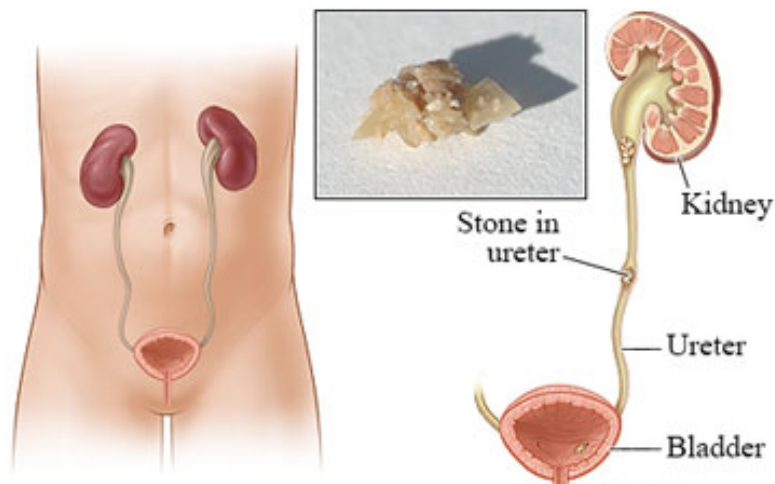
About kidney stones

Kidney stones are formed when salts, minerals, and other substances normally found in the urine clump together. They can be as small as grains of sand or, rarely, as large as golf balls.

While the stone is traveling through the ureter, which is the tube that carries urine from the kidney to the bladder, you may feel pain. The pain may be mild or very severe. You may also have some blood in your urine. As soon as the stone reaches the bladder, any intense pain should go away. If a stone is too large to pass on its own, you may need a medical procedure to help you pass the stone.

There are different types of kidney stones. A 24-hour urine test will find your risk factors for forming kidney stones. This information, along with the type of kidney stone you have, will help your healthcare provider recommend diet changes and medicines to lower your risk of forming more stones.

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Tips to prevent kidney stones

If you have had kidney stones before, follow these tips to lower your risk of getting them again:

Drink Plenty of Water and Other Fluids Each Day

- **Drink 3 liters (about 100 ounces) of water and other fluids daily** to make 2½ liters of urine. Drinking enough fluids is the best way to prevent kidney stones, no matter the type of stone. Drinking fluids throughout the day helps keep your urine diluted. The more diluted your urine is, the less risk you have to form a stone.
 - To meet your goal of 3 liters daily, drink 1 liter (4 cups or 32 ounces) of fluid 3 times a day (in the morning, afternoon, and evening) to spread out when you drink fluids.
 - Stop drinking 2 hours before bedtime to help reduce nighttime bathroom trips.
- **Make most of your fluids water.** You may also drink milk*, coffee, sugar free lemonade, diet soda (non-colas), and sparkling sugar free water.
 - Water is the best choice, but any of the drinks listed above can help you reach your daily fluid goal. Avoid sugary drinks like regular soda, lemonade, sports drinks, fruit punch, etc. Eating whole pieces of fruit is better than drinking fruit juice.

- *Most dairy foods are a good source of calcium that can reduce your risk of kidney stones by binding with oxalates in foods. Include milk or yogurt with meals and snacks.
 - If you are lactose intolerant, try lactose free milk. Yogurt and kefir are almost lactose free. If you do not tolerate dairy products at all, try calcium-fortified drinks and foods. Oat or rice milk, tofu with added calcium, and soy yogurt are good choices.
- **If you have a calcium-based stone** (the most common type of kidney stone), add lemon or lime juice to your water or try drinking lite or sugar free lemonade.
- **Make drinking your fluids a habit every day, 365 days a year.**
- For more helpful tips, ask for the handout “Preventing Kidney Stones with Fluids and Citric Acid” or visit go.osu.edu/pted5201.

Be Mindful of Oxalates, But Do NOT Worry Too Much

Oxalates are naturally found in some foods. High oxalate levels in your urine can increase the risk of certain types of kidney stones. **You only need to lower your oxalate intake if you have a high oxalate diet and high oxalate levels in your urine.** If your urine does not have high oxalate levels, then you do not need to worry about cutting back on oxalates. In fact, trying to avoid oxalates could take away important nutrients your body needs.

Foods high in oxalate to limit:

- Almonds (and almond milk)
- Beets
- Bran cereal
- Buckwheat
- Cashews
- Dark chocolate
- Navy beans
- Peanuts
- Potatoes (white and sweet)
- Rhubarb
- Spinach

Tip: If you eat foods with high oxalates, try to eat calcium-rich foods with them. This helps the calcium bind to the oxalates in your stomach and intestines instead of urine, making it less likely for kidney stones to form. Good sources of calcium include most dairy products like milk, yogurt, and cheese.

Eat a Healthy Diet with Plenty of Fruits and Vegetables

There are many compounds in fruits and vegetables that help to prevent kidney stones like potassium, magnesium, and citric acid. **Try to include at least 1 fruit or vegetable at each meal.** Fruits and vegetables make great snacks too!

Fruits: Eat 4 to 5 servings per day.

- 1 serving equals:
 - 1 medium fruit
 - ½ cup fresh, frozen, or canned fruit
- Choose whole fruits (fresh, frozen, or dried) over fruit juice.
- Add up to ½ cup or 4 ounces of lemon or lime juice to 1 to 2 liters of water and drink that throughout the day.



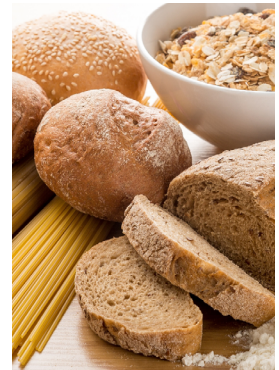
Vegetables: Eat 4 to 5 servings per day.

- 1 serving equals:
 - 1 cup raw, leafy vegetables
 - ½ cup chopped raw or cooked vegetables
 - ½ cup low sodium vegetable juice
- Eat more non-starchy vegetables like broccoli, carrots, lettuce, cucumbers, mushrooms, onions, cauliflower, and cabbage.



Grains: Eat 4 to 6 servings per day.

- 1 serving equals:
 - 1 slice of bread
 - 1 ounce of dry cereal (about ½ to 1¼ cups, depending on cereal type)
 - ½ cup of cooked rice, pasta, grains, or cereal
- Choose whole grains (100% whole wheat or whole grain bread, brown rice, quinoa, or oatmeal) over refined grains (white flour, degermed cornmeal, white bread, or white rice).



Fat free or low fat dairy: Eat or drink 3 to 4 servings per day.

- 1 serving equals:
 - 1 cup fat free or 1% low fat milk
 - 1½ ounces low fat cheese
 - 6 ounces fat free or low fat yogurt



Lean meats, poultry, fish, and eggs: Eat up to 6 to 8 ounces of animal protein per day.

- 1 ounce cooked meat, poultry, or fish is about 7 grams of protein.
- 1 egg is about 1 ounce or 7 grams of protein.
- Try to keep animal protein servings to about 3 to 4 ounces (21 to 28 grams of protein) at meals. **This is about the size of a deck of cards or ¼ of your plate.**
- Eating too much animal protein can increase your chances of getting kidney stones, but not eating enough can cause malnutrition. Most people need 50 to 75 grams of protein a day. To learn more about your specific protein needs, ask for the handout “Protein: How Much You Need and Where to Get It” or visit go.osu.edu/pted1209.
- Read food labels to learn how much protein is in a food.
- Trim visible fat from meats and remove skin from poultry.
- Use low fat cooking methods, like broil, roast, poach, and bake.



- Try whole food, plant-based proteins like beans, lentils, tofu, nuts, and seeds, but avoid plant-based meat products. For more information, see the **Legumes, nuts, and seeds** section.
- Avoid supplemental protein shakes or powders unless your provider advises them.

Legumes (beans, lentils, and peas), nuts, and seeds: Eat 4 to 5 servings per week.

- 1 serving equals:
 - ½ cup cooked beans, lentils, or peas
 - 4 ounces tofu
 - ¼ cup or 1 ounce nuts
 - 2 tablespoons nut butter
 - 2 tablespoons or ½ ounce seeds
- Avoid plant-based meat products like burgers, patties, and nuggets because they often have ingredients that can increase your risk of kidney stones.



Fats and oils: Eat 2 to 3 servings per day.

- 1 serving equals:
 - 1 teaspoon oil, butter, or margarine
 - 1 tablespoon mayonnaise
 - 2 tablespoons salad dressing
- Use olive oil as your first choice for oils and over butter or margarine.
- Use small amounts of butter or margarine.



Sodium: Limit to 2,300 mg or less per day.

- 2,300 mg of sodium = 1 teaspoon of salt.
- Eating too much salt can make you more likely to get kidney stones because it causes more calcium to pass into your urine.
- Most of the sodium in our diets comes from:
 - Restaurant foods
 - Fast foods
 - Processed foods, like lunch meat, canned soups and vegetables, and boxed or packaged mixes like macaroni and cheese



Limit these foods in your diet.

- Keep track of how much sodium you eat each day. Read food labels to learn how much sodium is in a food. Avoid products that have more than 300 milligrams (mg) of sodium per serving.
- Fresh fruits and vegetables, meats, and plain whole grains have very little sodium.
- For more ways to lower sodium in your diet, ask for the handout “Lowering Sodium in Your Diet” or visit go.osu.edu/pted1287.

Sweets and added sugars:

- Limit added sugar to:
 - 100 calories, 6 teaspoons, or 24 grams per day for people with female anatomy.
 - 150 calories, 9 teaspoons, or 36 grams per day for people with male anatomy.
- Read food labels to determine how much added sugar a product has. Added sugars are found in baked goods, desserts, and drinks like soda, sweet tea, regular lemonade, juice drinks, juice, and sports drinks.
- Added sugars can increase the risk of kidney stones and lead to other health problems.
- Instead, eat more fruit to satisfy your sweet tooth.

Key Takeaways

To reduce your risk of kidney stones, drink plenty of fluids, eat a balanced diet, limit sodium, and avoid too much added sugar and animal protein. Taking these steps can help protect your kidneys and prevent kidney stones.

If you have questions about this diet, talk to your provider about a referral to see a dietitian.

For more information, visit these websites

- National Kidney Foundation at [kidney.org/kidney-topics/kidney-stone-diet-plan-and-prevention](https://www.kidney.org/kidney-topics/kidney-stone-diet-plan-and-prevention)
- National Institute of Health (NIH), National Institute of Diabetes and Digestive and Kidney Disease (NIDDK) at niddk.nih.gov/health-information/urologic-diseases/kidney-stones/eating-diet-nutrition

This handout is for informational purposes only. Talk to your healthcare provider if you have any questions about your care.

For more health information, go to wexnermedical.osu.edu/patiented or contact the Library for Health Information at 614-293-3707 or health-info@osu.edu.