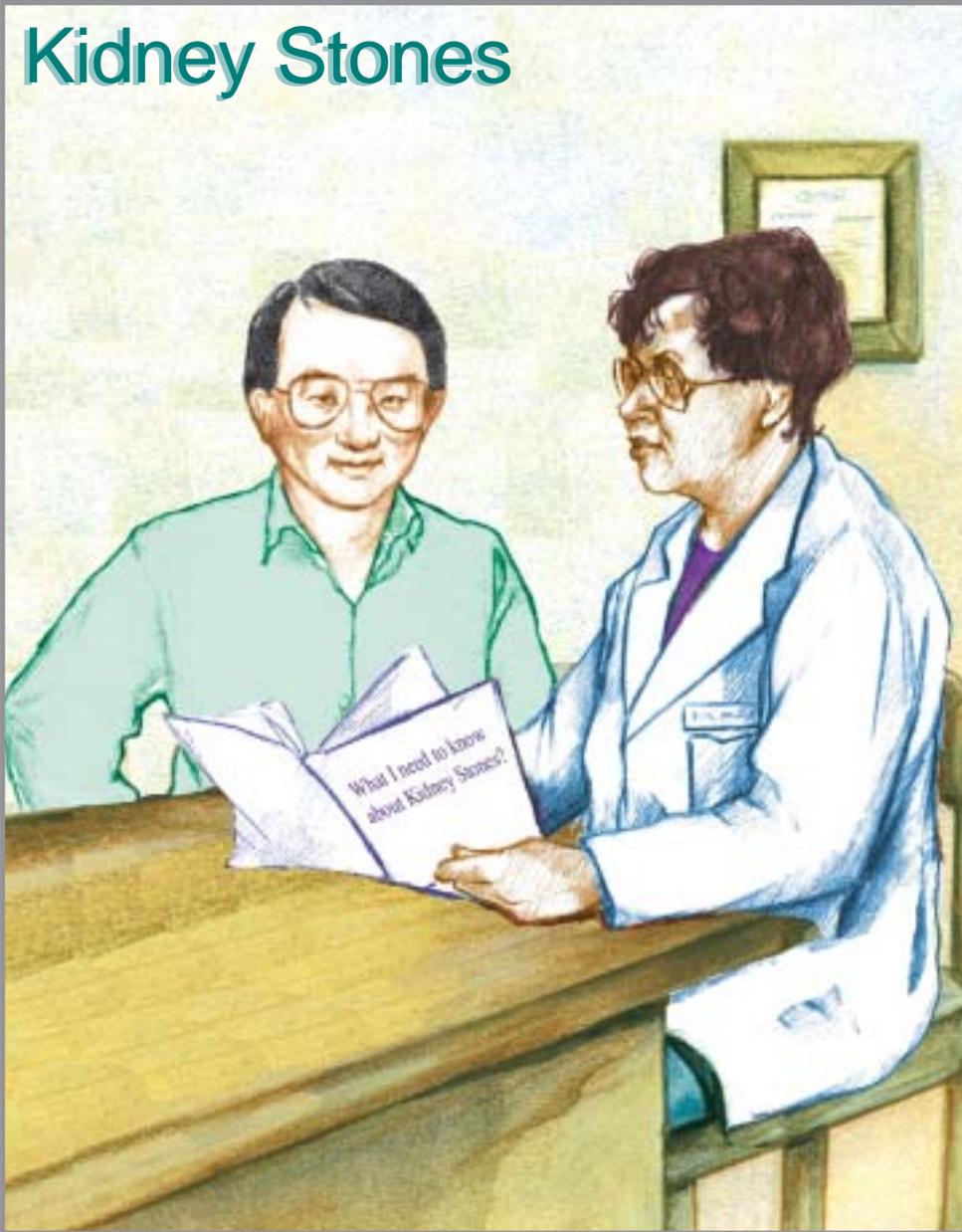


What I need to know about Kidney Stones



NATIONAL INSTITUTES OF HEALTH
National Kidney and Urologic Diseases Information Clearinghouse



U.S. Department
of Health and
Human Services

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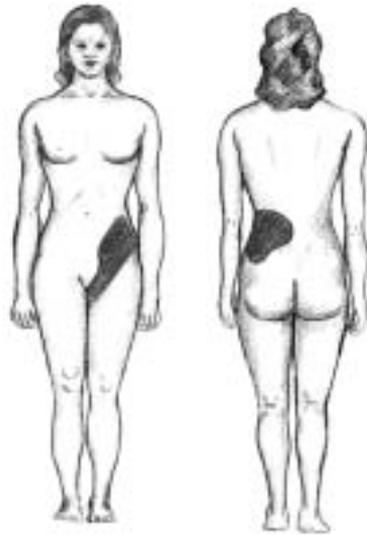
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When should I call a doctor?

If you have a kidney stone, you may already know how painful it can be. Most kidney stones pass out of the body without help from a doctor. But sometimes a stone will not just go away. It may even get larger. Your doctor can help.

You should call a doctor when you have

- extreme pain in your back or side that will not go away
- blood in your urine
- fever and chills
- vomiting
- urine that smells bad or looks cloudy
- a burning feeling when you urinate

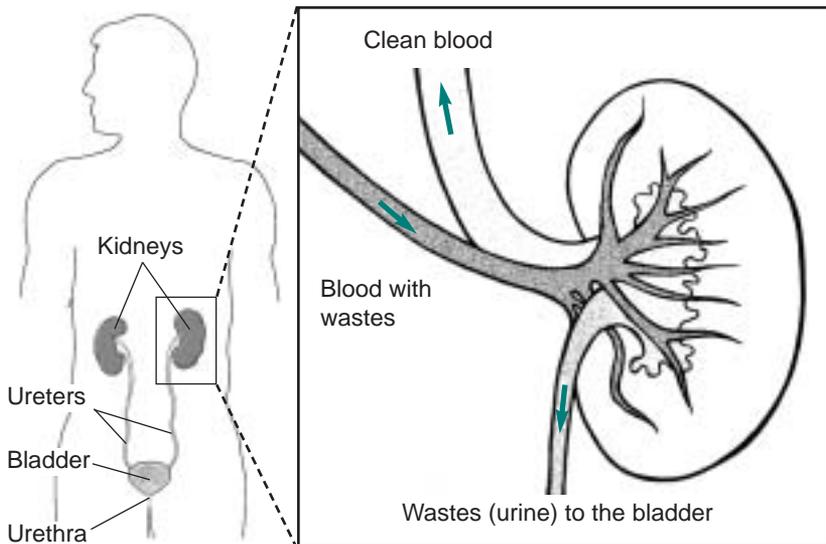


These may be signs of a kidney stone that needs a doctor's care.

Pain in the shaded areas may be caused by kidney stones.

What do my kidneys do?

Your kidneys are bean-shaped organs, each about the size of your fist. They are located near the middle of your back, just below the rib cage. The kidneys are sophisticated trash collectors. Every day, your kidneys process about 200 quarts of blood to sift out about 2 quarts of waste products and extra water. The waste and extra water become urine, which flows to your bladder through tubes called ureters (YOOR-uh-turs). Your bladder (BLAD-ur) stores urine until you go to the bathroom.



Wastes removed from the blood go to the bladder.

The wastes in your blood come from the normal breakdown of active muscle and from the food you eat. Your body uses the food for energy and self-repair. After your body has taken what it needs from the food, waste is sent to the blood. If your kidneys did not remove these wastes, the wastes would build up in the blood and damage your body.

In addition to removing wastes, your kidneys help control blood pressure. They also help to make red blood cells and keep your bones strong.

What is a kidney stone?

A kidney stone is a solid piece of material that forms in the kidney out of substances in the urine.

A stone may stay in the kidney or break loose and travel down the urinary tract. A small stone may pass all the way out of the body without causing too much pain.

A larger stone may get stuck in a ureter, the bladder, or the urethra. A problem stone can block the flow of urine and cause great pain.

Are all kidney stones alike?

No. There are four major types of kidney stones.

- The most common type of stone contains **calcium** (KAL-see-um). Calcium is a normal part of a healthy diet.

Calcium that is not used by the bones and muscles goes to the kidneys. In most people, the kidneys flush out the extra calcium with the rest of the urine. People who have calcium stones keep the calcium in their kidneys.

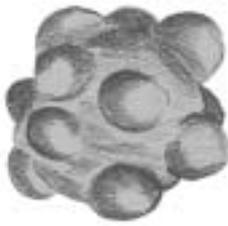
The calcium that stays behind joins with other waste products to form a stone.

- A **struvite** (STROO-vite) stone may form after an infection in the urinary system. These stones contain the mineral magnesium (mag-NEE-zee-um) and the waste product ammonia (uh-MOH-nyuh).
- A **uric** (YOOR-ik) acid stone may form when there is too much acid in the urine. If you tend to form uric acid stones, you may need to cut back on the amount of meat you eat.

- **Cystine** (SIS-teen) stones are rare. Cystine is one of the building blocks that make up muscles, nerves, and other parts of the body. Cystine can build up in the urine to form a stone. The disease that causes cystine stones runs in families.

What do kidney stones look like?

Kidney stones may be as small as a grain of sand or as large as a pearl. Some stones are even as big as golf balls. Stones may be smooth or jagged. They are usually yellow or brown.



Golf ball sized
and brown

Small and smooth



Jagged and yellow

Kidney stones vary in size and shape. These are not actual size.

What can my doctor do about a problem stone?

If you have a stone that will not pass by itself, your doctor may need to take steps to get rid of it. In the past, the only way to remove a problem stone was through surgery.

Now, doctors have new ways to remove problem stones. The following pages describe a few of these methods.

Shock Waves

Your doctor can use a machine to send shock waves directly to the kidney stone. The shock waves break a large stone into small stones that will pass through your urinary system with your urine.

Two types of shock wave machines exist. With one machine, you sit in a tub of water. With the other type of machine, you lie on a table.

The full name for this method is extracorporeal (EKS-trah-kor-POR-ee-ul) shock wave lithotripsy (LITH-oh-TRIP-see). Doctors often call it ESWL for short. Lithotripsy is a Greek word that means stone crushing.

Tunnel Surgery

In this method, the doctor makes a small cut into the patient's back and makes a narrow tunnel through the skin to the stone inside the kidney. With a special instrument that goes through the tunnel, the doctor can find the stone and remove it. The technical name for this method is percutaneous (PER-kyoo-TAY-nee-us) nephrolithotomy (NEF-row-lith-AH-tuh-mee).

Ureteroscope

A ureteroscope (yoo-REE-ter-uh-scope) looks like a long wire. The doctor inserts it into the patient's urethra, passes it up through the bladder, and directs it to the ureter where the stone is located. The ureteroscope has a camera that allows the doctor to see the stone. A cage is used to catch the stone and pull it out, or the doctor may destroy it with a device inserted through the ureteroscope.

Ask your doctor which method is right for you.

How will my doctor find out what kind of stone I have?

The best way for your doctor to find out what kind of stone you have is to test the stone itself. If you know that you are passing a stone, try to catch it in a strainer.

Your doctor may ask for a urine sample or take blood to find out what is causing your stones. You may need to collect your urine for a 24-hour period. These tests will help your doctor find ways for you to avoid stones in the future.



Try to catch a stone in a strainer.

Why do I need to know the kind of stone?

The therapy your doctor gives you depends on the type of stone you have. For example, a medicine that helps prevent calcium stones will not work if you have a struvite stone. The diet changes that help prevent uric acid stones may have no effect on calcium stones. Therefore, careful analysis of the stone will help guide your treatment.

What can I do to avoid more stones?

Drink more water. Try to drink 12 full glasses of water a day. Drinking lots of water helps to flush away the substances that form stones in the kidneys.

You can also drink ginger ale, lemon-lime sodas, and fruit juices. But water is best. Limit your coffee, tea, and cola to one or two cups a day because the caffeine may cause you to lose fluid too quickly.

Your doctor may ask you to eat more of some foods and to cut back on other foods. For example, if you have a uric acid stone, your doctor may ask you to eat less meat, because meat breaks down to make uric acid.

The doctor may give you medicines to prevent calcium and uric acid stones.



Try to drink 12 full glasses of water every day.

Points to Remember

- Most stones will pass out of the body without a doctor's help.
- See your doctor if you have severe pain in your back or side that will not go away.
- See your doctor if you have blood in your urine (urine will appear pink).
- Drink lots of water to prevent more kidney stones from forming.
- When you pass a stone, try to catch it in a strainer to show to your doctor.
- Talk to your doctor about how to avoid more stones.

For More Information

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Publications produced by the clearinghouse are carefully reviewed by both NIDDK scientists and outside experts.

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