



Kidney Stones

What are kidney stones?

A kidney stone is a solid piece of material that forms in the kidney out of substances in the urine. Stones can occur in any part of the urinary system, from the kidney to the bladder. They may be small or large. You may have just one stone or many. Your kidneys filter your blood and excrete waste products and excess water as urine. The kidneys are located in the abdomen, on either side of your spine, just above your waist.

Kidney stones are most common in middle-aged people and are 3 times more common in men than in women. They tend to recur.

How does this occur?

There are several types of kidney stones, but most stones are calcium stones. They occur when there is too much calcium in the urine. If your kidneys don't work properly or if too much calcium is absorbed from your stomach and intestines, you may have excess calcium in your urine. Some calcium stones are caused by too much of a chemical called oxalate that is found in many foods including spinach, rhubarb, leafy vegetables, coffee, chocolate, and tomatoes. Oxalate binds easily with calcium to form a stone. Also, the risk of forming calcium stones increases if you have certain medical conditions such as an overactive parathyroid gland (a gland in that neck that regulates calcium levels in the body) or inflammatory bowel disease.

A second type of kidney stone occurs because you have too much uric acid in your urine. Uric acid stones might result if you become dehydrated, for example, during strenuous exercise on a hot day or during an illness. Uric acid stones are common in people who have gout, a disease that causes high uric acid levels in the blood. Struvite stones are a third type. They are also called infection stones because they form in urine that is infected with bacteria.

Finally, a rare type of kidney stone is a cystine stone. It occurs if you have the genetic disease called cystinuria. This disease results from a birth defect that causes the kidney to allow too much cystine into the urine. This type of stone formation is almost always diagnosed during childhood.

What are the symptoms?

Often kidney stones do not cause any symptoms. When they do, the symptoms usually are:

- severe, crampy pain in your back or abdomen (the most common symptom)
- nausea and vomiting (sometimes).

Sometimes the presence of kidney stones causes a urinary tract infection. If you have a urinary tract infection, your symptoms may include fever, chills, sweats, and pain when you urinate.

Kidney stones and urinary tract infection can cause blood to be in the urine. Usually the blood is seen only with a microscope, but it can turn the urine pink or red. Some people have no symptoms until they pass gravel-like stones in their urine. Others never have any symptoms, and their stones are found during testing for other problems.

How is it diagnosed?

Your healthcare provider will ask about your symptoms and examine you. Samples of your urine and blood will be tested.

Sometimes the pattern of pain over time is helpful in the diagnosis. The pain may move from the upper to the lower abdomen over a few hours. As the stone moves lower, the pain may be felt in the genitals, especially the testicles in men and the labia in women.

In addition to a urine test, you may have one or more of these tests:

- X-ray of your abdomen
- ultrasound scan
- CT scan (computerized X-rays)
- intravenous pyelogram (IVP), which is a special type of X-ray done after a dye is injected into one of your veins.

How is it treated?

Treatment depends on the size and location of the stone(s), whether one or more stones are blocking urine flow out of the kidney, and whether there are signs of infection.

You may be treated at home by drinking lots of liquids and taking pain medicine. Kidney stones that are 3/16 of an inch or less in diameter usually pass on their own. Your healthcare provider may ask you to strain all urine until the stone is passed. When the stone is caught, it can then be analyzed with lab tests.

You may need to be in the hospital if:

- You are vomiting too much to drink liquids.
- You have signs of urinary infection or a kidney abnormality.
- You need surgery to remove a large stone.

If you have a bladder stone that needs to be removed with surgery, it may be removed, under anesthesia, through a cystoscope. If the stone is in the ureter or kidney, it may be removed through a ureteroscope. These instruments are slim, lighted, usually flexible, fiber-optic telescopes, which can be passed through the urethral opening into the urinary tract. Tiny tools can be passed through a scope to trap and remove the stone. Or the stones may be broken into small pieces with a laser or ultrasound.

Another surgical procedure that might be used is called percutaneous nephrolithotomy, or tunnel surgery. After you are given an anesthetic, your healthcare provider makes a small cut in your back and makes a narrow tunnel through the skin into the kidney. With a special scope that goes through the tunnel, your provider can find the stone and remove it.

Some medical centers have special machines that break up stones with shock waves (a technique called lithotripsy). The smaller fragments can then be passed in the urine.

How long will the effects last?

Usually you have pain off and on for several hours up to 1 or 2 days. However, a stone may take days or even weeks to pass. Sometimes weekly X-rays will be taken to track the progress of the stone as it moves down the urinary tract. If a stone has not passed after a month or so, it may need to be surgically removed.

How can I take care of myself?

- Follow your healthcare provider's instructions.
- Make sure you drink enough liquids.
- Watch for signs of kidney infection, such as fever, chills, sweats, and worsening back or abdominal pain.
- Take the pain medicine as prescribed by your healthcare provider.
- Contact your provider if any problems or questions arise or if you are feeling worse instead of better.

What can be done to help prevent kidney stones?

- Follow your healthcare provider's recommended treatment for any health problems that may be causing kidney stones.
- Drink plenty of water daily. Make sure you avoid getting dehydrated.
- Follow any changes in your diet recommended by your provider after the stone has been tested in the lab.