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Kidney Stones

What Are Kidney Stones?

The kidneys are the body's filtration system. You have two kidneys, which are located on either side of your spine at the back of your waist. Their main function is to separate and filter excess water and waste from the bloodstream. Waste products like urea and toxins along with excess fluids are removed from the blood stream in the form of urine. Urine flows down from each kidney through tubes called ureters to the bladder and then out of the body through the urethra.

A kidney stone is a lump of crystalline mineral that has formed within the kidney. It has crystallized out of the waste products in your urine. Normally crystals do not form in the urine; however, certain conditions such as dehydration may cause them to form. The stone may stay in your kidney, or it may travel down the ureters to the bladder and out the urethra. But if the stone is big enough, it can get stuck in your kidney, in the ureter, or in the urethra. When a stone gets stuck, it can be excruciatingly painful.

While very small kidney stones pass with no or with only a little pain, larger stones can cause serious problems. Some kidney stones can cause damage to the urinary tract by scraping the sides of the ureters or urethra, which can lead to a urinary tract infection. A stone can become so lodged that urine is backed up into the kidney, which can damage it; a situation that requires prompt attention.

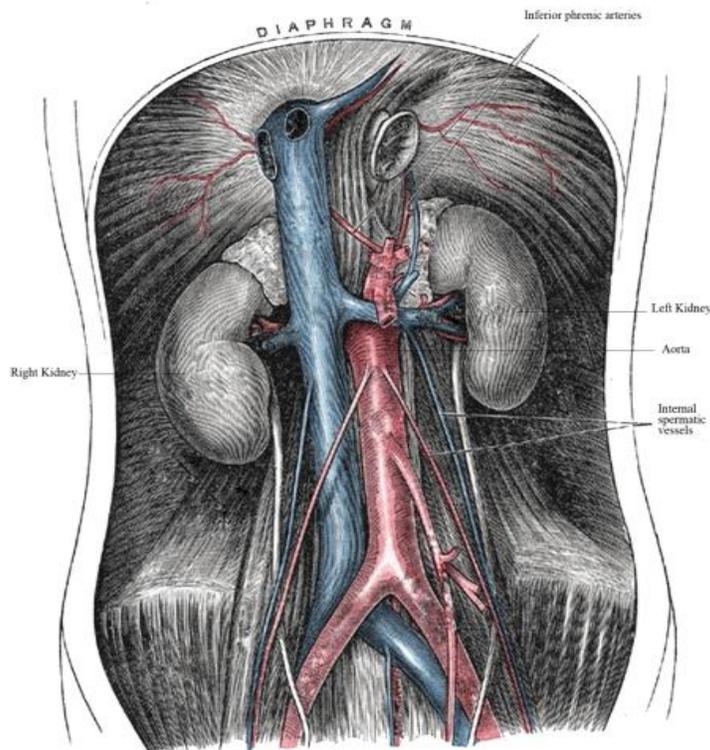
What Causes Kidney Stones?

Kidney stones are formed when urine becomes concentrated. Certain substances in the urine like calcium, oxalate, uric acid, and cystine, leave small residues or crystals, along

the inner surface of the kidneys. These residues are usually flushed out along with urine, but sometimes they collect and form stones. Some stones are made from several of these substances, but the most common type of stone is made of calcium.

Some of the most common causes for kidney stones are:

- ❖ Family history, since a tendency to form kidney stones runs in families
- ❖ Kidney disorders, such as polycystic kidneys
- ❖ Metabolic disorders, such as hyperparathyroidism, interfere with some of the chemical balances in the body
- ❖ The acidity, or pH, of urine; when urine is alkaline, calcium phosphate stones may start to form deposits

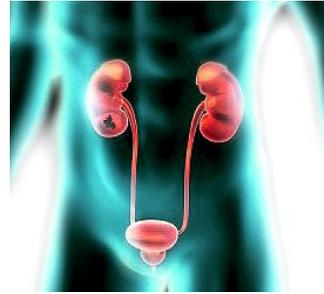


Who Is at Risk of Kidney Stones?

If you have any of these risk factors you are at the risk of having kidney stone:

- ❖ Not drinking enough water
- ❖ Obesity

- ❖ Excessive sodium intake
- ❖ Family genetics
- ❖ High-protein diets
- ❖ Drinking a lot of caffeinated or carbonated beverages



What Are the Signs and Symptoms of Kidney Stones?

Many times you may not even know you have had a stone, since tiny ones pass through your urine without causing problems. But kidney stones that are larger scrape the inside of the kidney and ureters and cause pain that can be very intense. Kidney stones usually cause a severe cramping pain in your lower back or side. This pain usually moves down toward your abdomen, groin, or genitals as the stone moves down the urinary tract.

Other symptoms of kidney stones may include:

- ❖ Nausea and vomiting
- ❖ Cloudy or bloody urine
- ❖ Fever
- ❖ Constant urge to urinate
- ❖ Recurrent urinary infection
- ❖ Fever and chills if an infection is present

How Are Kidney Stones Diagnosed?

Kidney stones are diagnosed by a physical exam and a test of urine to look for blood cells and crystals. Blood tests to check for calcium, uric acid, and phosphorus levels are also usually done. Kidney stones can also be diagnosed when seen on:

- ❖ Spiral computerized tomography (sCT) scan
- ❖ Program: uses a dye to highlight the kidney, bladder, and ureters
- ❖ X-ray

- ❖ Ultrasounds

What Are Common Treatments?

Treatment for a kidney stone varies depending on the type of stone you have and how severe your symptoms are. If you have severe symptoms you may need to be hospitalized. In many situations, you will be told to drink a lot of fluids and to wait for the stone to pass. You may be asked to urinate through a strainer to catch the stone when it comes out so that it can be analyzed. While waiting for the stone to make its exit, you may be prescribed pain relievers, and if you are in very severe pain, you may need to be hospitalized for medication and intravenous fluids.

Medications

Depending on the type of stone that has formed, your doctor may prescribe drugs to help prevent formation of new stones or to break down stones in your kidney or bladder. These medications include:

- ❖ Allopurinol: reduces the amount of uric acid the body makes
- ❖ Hydrochlorothiazide: a diuretic to increases the amount of urine
- ❖ Penicillamine: binds with heavy metals and cystine in the urine

Surgery

If the stone is very large and will not pass, if it is completely blocking the ureter, or if it is continuing to grow, you may need surgery. One procedure, lithotripsy, does not involve an incision. It uses shock waves to break up stones in the kidney or ureter. After the procedure, the tiny pieces of stones pass out of your body in your urine.

In percutaneous nephrostolithotomy the surgeon makes a small incision in your back and uses a fiberoptic camera and tube to remove the kidney stone.

In ureteroscopy a tube with a fiberoptic light and small devices is inserted through the urethra and as far up as the kidney to remove stones or break them up.

Can Kidney Stones Be Prevented?

If you have a personal or family history of kidney stones, make sure you drink plenty of water or other fluids each day. If you have had one kidney stone, you are more likely to develop another one. Drink six to eight glasses of water each day to make sure you are producing enough urine. Do not wait to be thirsty before you drink water.

Other ways to prevent stones include:

- ❖ Avoiding foods that are rich in oxalic acid (rhubarb, spinach, beets, and Swiss chard)
- ❖ Making sure you take between 1000 to 1200 milligrams of calcium each day
- ❖ Avoid sugar, caffeine, and excess salt
- ❖ Get plenty of exercise to keep your body's fluids moving

Lifestyle changes always take some effort and might seem inconvenient at first. However, when compared to the painful process of passing a kidney stone, a few lifestyle changes are a cinch.

Should I Call My Doctor?

Call your doctor if you experience any of these symptoms:

- ❖ Severe cramping pain in your lower back or side
- ❖ Nausea and vomiting
- ❖ Cloudy or bloody urine
- ❖ Fever
- ❖ Constant urge to urinate
- ❖ Recurrent urinary infection

For More Information

For more information, refer to the following medical resources:

<http://kidney.niddk.nih.gov/kudiseases/pubs/stonesadults/>

<http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001493/>

<http://www.nlm.nih.gov/medlineplus/kidneystones.html>

The content in this document is neither intended nor recommended as a substitute for seeking professional medical advice, diagnosis or treatment. It is recommended that you seek the advice of your physician or other qualified healthcare professional regarding any medical questions related to the topics contained within this document, your health or conditions.