

Patient information from BMJ

Last published: Apr 17, 2023

Kidney stones

Having a kidney stone can be painful and distressing. Most stones pass out of the body without any treatment.

What are kidney stones?

Kidney stones are solid, stone-like lumps that can form in your kidneys. They are made from waste chemicals in your urine.

Kidney stones can stay in your kidneys without causing problems. But some might travel out of your body in the flow of urine.

Very small kidney stones can pass out of your body without you noticing. But larger ones can rub against the tubes carrying urine from your kidneys to your bladder (the ureters) and even get stuck. This can be extremely painful.

There are four main types of kidney stone:

- The most common type contains calcium. These stones are called calcium oxalate stones and calcium phosphate stones.
- Uric acid stones form if there is too much uric acid in your urine. Uric acid is a waste product made when food is digested.
- Struvite stones develop after a urinary infection, such as cystitis.
- Cystine stones are caused by a rare inherited condition called cystinuria.

Your doctor might recommend having tests to find out what kind of stone you have.

What are the symptoms?

The main symptom is pain. This can be a dull ache in your back or side, or an extremely sharp, cramping pain. The pain usually comes on suddenly. It might spread down to your abdomen or groin. You might also:

- feel sweaty
- feel sick to your stomach or vomit
- need to urinate more often or feel a burning sensation when you urinate.

Kidney stones

If your doctor suspects that you have a kidney stone, you will have blood and urine tests to check for signs of bleeding, infection, and other possible problems.

Having traces of blood in your urine is a common sign of a kidney stone. This is caused by the stone rubbing against the walls of the ureter. The blood isn't usually visible but shows up on tests.

You'll also need an imaging test to check for a stone. The most common is a type of x-ray called a CT scan. If you have a kidney stone, the scan might show the stone's size and location.

If the scan does not show a kidney stone, you will probably have more tests to find out what's causing the pain.

You might not get any symptoms with a kidney stone. You might find out you have one when you have a scan for another reason.

What treatments work?

Treatments to help stones pass

Stones that are less than four tenths of one inch (1 centimeter) across often pass out of the body without any treatment. It can take several weeks to pass a stone, although some pass much sooner.

You can help the process along by drinking plenty of water to increase the flow of urine. Your doctor might also prescribe strong painkillers for the pain.

You might need medicines called anti-emetics if you are feeling nauseous and vomiting. Also, it's not uncommon for people with kidney stones to have a urinary tract infection. If you have an infection, your doctor will prescribe antibiotics.

If you have a stone stuck in a tube (ureter), your doctor might recommend taking a medicine called an alpha-blocker. This type of drug is often used to treat high blood pressure or symptoms of an enlarged prostate. It can also help stones to pass by relaxing the muscles of the ureters.

Your doctor might ask you to catch the stone with a tea strainer or something similar as it comes out. This is so your doctor can see what type of stone you have. Knowing the type of stone might help your doctor work out what you can do to prevent more stones.

You probably won't need to be admitted to the hospital while you're passing a stone, although you might need scans to check on the progress of the stone.

However, if you have signs of infection (such as a fever), you should seek treatment right away. This is because you could get a life-threatening problem called urosepsis, in which an infection in your urinary tract spreads to your bloodstream.

Treatments to break up or remove stones

You'll need other treatments for larger stones and those that don't pass out of the body.

Kidney stones

One of the main treatments is called extracorporeal shock wave lithotripsy (ESWL). It uses shock waves to break up stones into small pieces that can pass out of the body. Many stones are treated this way and it avoids any operation.

With ESWL you might sit in a tub of water or lie on a table to have shock wave treatment. You'll have a local anesthetic to numb the area that's being treated.

You might need several treatments to break up hard or large stones. The risk of side effects after this treatment is small. But you could get bleeding, an infection, or fragments of stones blocking the ureter.

Sometimes people need a minor procedure or operation if other treatments haven't worked or if their stone is very large or in an awkward place.

In one treatment, called a ureteroscopy, the doctor inserts a long, thin wire into your urethra, up through your bladder and into one of your ureters, to remove the stone or break it up with a laser. (The urethra is the tube that carries urine out of your body.)

In another treatment, called a percutaneous nephrolithotomy (PCNL), the doctor makes a small cut in your back to pass a needle and a very thin tube into your kidney to remove the stone.

People usually go home from the hospital the same day that they have these treatments. Rarely, people need a larger operation and need to stay in the hospital.

Extra treatment to drain blocked urine

If a stone is blocking the flow of urine, you might need extra treatment to drain the urine from your kidney. This can be done by having a thin tube called a stent put into your urethra and up past the blockage. Another treatment involves putting a small, flexible tube called a catheter through your skin and into your kidney to drain the urine.

What will happen to me?

Treatments for kidney stones usually work well. But you may get them again. If you've had a kidney stone, you have:

- a 5 in 10 chance of getting another one within five years
- an 8 in 10 chance of getting another one within 10 years.

The most important thing you can do to prevent more stones is to drink plenty of water. Doctors often recommend drinking more than 2 quarts a day (more than nine 8-ounce glasses). Your doctor may also prescribe medicines to help stop more stones forming.

Your chance of getting more stones may also be affected by what you eat. For example, eating citrus fruits might help to stop new stones from forming. Experts also recommend:

- eating a healthy diet, with plenty of fruit, vegetables, fiber, and calcium (but not calcium supplements)
- avoiding too much salt

Kidney stones

- not eating too much meat and other sources of protein.

If you've had a calcium oxalate stone, you might need to reduce the amount of oxalate in your diet. This means cutting down on chocolate, nuts, rhubarb, spinach, coffee, and tea.

If you've had a uric acid stone, you should limit your intake of foods high in urate. These include poultry skin, herring with skin, anchovies, sprats, and animal organs (such as liver, kidneys, brains, and sweetbreads).

You might also need to limit these foods if you have a calcium oxalate stone related to high urate levels.

However, it's important to talk to your doctor before making big changes to what you eat.

The patient information from *BMJ Best Practice* is regularly updated. The most recent version of Best Practice can be found at bestpractice.bmj.com. This information is intended for use by health professionals. It is not a substitute for medical advice. It is strongly recommended that you independently verify any interpretation of this material and, if you have a medical problem, see your doctor.

Please see BMJ's full terms of use at: bmj.com/company/legal-information. BMJ does not make any representations, conditions, warranties or guarantees, whether express or implied, that this material is accurate, complete, up-to-date or fit for any particular purposes.

© BMJ Publishing Group Ltd 2024. All rights reserved.

What did you think about this patient information guide?

Complete the [online survey](#) or scan the QR code to help us to ensure our content is of the highest quality and relevant for patients. The survey is anonymous and will take around 5 minutes to complete.



BMJ Group