



Kidney stones

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This chapter contains general information about kidney stones. If you have any specific questions about your individual medical situation you should consult your doctor or other professional healthcare provider. No website or leaflet can replace a personal conversation with your doctor.

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This information has been reviewed by a lay panel.

Kidney stones

About kidney stones

Kidney stones are hard, pebble-like objects that are made up of minerals and salts. They can affect any part of the urinary tract, from your kidneys to your bladder, and can be very painful. They are quite common, especially in people aged 30 to 60 years.

Kidney stones can be caused by not drinking enough fluids, as stones can form when urine becomes too concentrated, allowing minerals to crystallise and stick together. Other causes include a diet that is high in protein but low in fibre, excess body weight, some medical conditions, structural problems with the kidneys, inherited diseases, and certain supplements and medications.

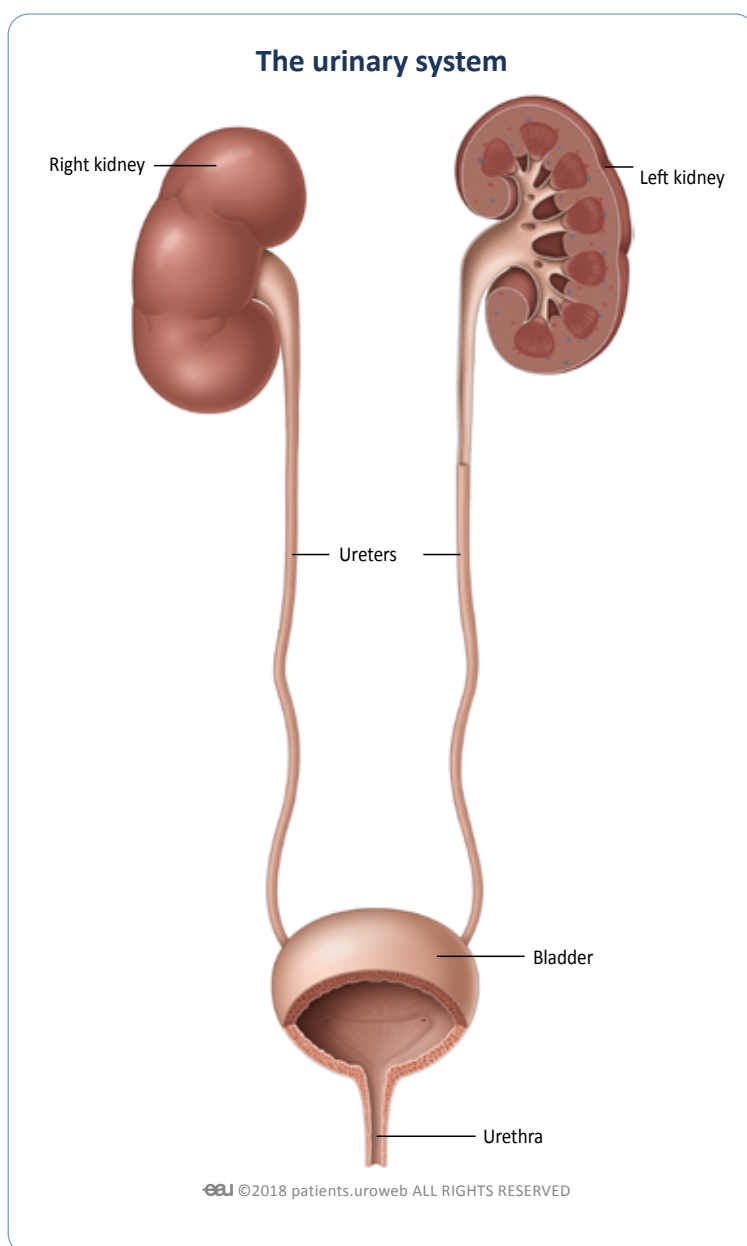
Treatments

What treatments are available for kidney stones?

A kidney stone won't usually cause symptoms until it moves around within the kidney or passes into your ureters (the tubes connecting the kidneys to the bladder). If a kidney stone blocks the ureters, it can stop the flow of urine, causing the affected kidney to swell and the ureter to spasm, which can be very painful. If this occurs, you may experience symptoms such as:

- Intense pain in your side and back, below the ribs;
- Pain that radiates to the groin and lower abdomen;
- Pain that comes and goes in severity;
- Pain when passing urine;
- Urine that is pink, red, brown or cloudy, or smells unpleasant;
- Feeling like you need to urinate all the time;
- Nausea and vomiting;
- Fever and chills may mean that you have an infection.

There are several methods for treating kidney stones. Your doctor will discuss treatment options with you and advise which they would recommend for you based on your medical history, the size of the kidney stone(s), and where it is located.



For small kidney stones, it is likely that in the first instance you would be recommended by your doctor to drink plenty of water to try to pass the stones out in your urine. You can take over-the-counter pain medication if you feel discomfort or pain when trying to flush out kidney stones. You can also take an anti-sickness medicine if you feel sick.

'Watchful waiting' is another option you may wish to consider if you have small kidney stones. This is when a doctor assesses you over time to see the extent and nature of your specific symptoms before deciding what treatment to recommend.

For larger kidney stones or in cases where kidney stones have become lodged somewhere in the urinary tract, or are causing complications, medicines or surgery are likely to be needed.

Drug treatments for minor kidney stones

Kidney stones that cannot be flushed out in the urine, but are still considered relatively minor, can be treated with Medical Expulsive Therapy or by dissolving them.

Medical Expulsive Therapy (MET)

Medical Expulsive Therapy can be used for stones measuring between 5mm and 10mm. It involves giving you prescription medication in the form of a tablet, which relaxes the ureter muscles so as to help stones pass out in your urine and to limit pain while the stones move. The medication is taken for 4 to 6 weeks. Drinking plenty of fluids can help with the process.

If you are in a lot of pain, develop an infection or your kidney function starts to suffer, a different treatment would be required.

Dissolving kidney or ureteral stones

If you suffer from uric acid stones (which are acidic), it may be possible to dissolve them. This is done by giving you oral medication that increases the pH value of your urine (making it more alkaline rather than acidic). This causes the stone(s) to decrease in size and may even dissolve them completely.

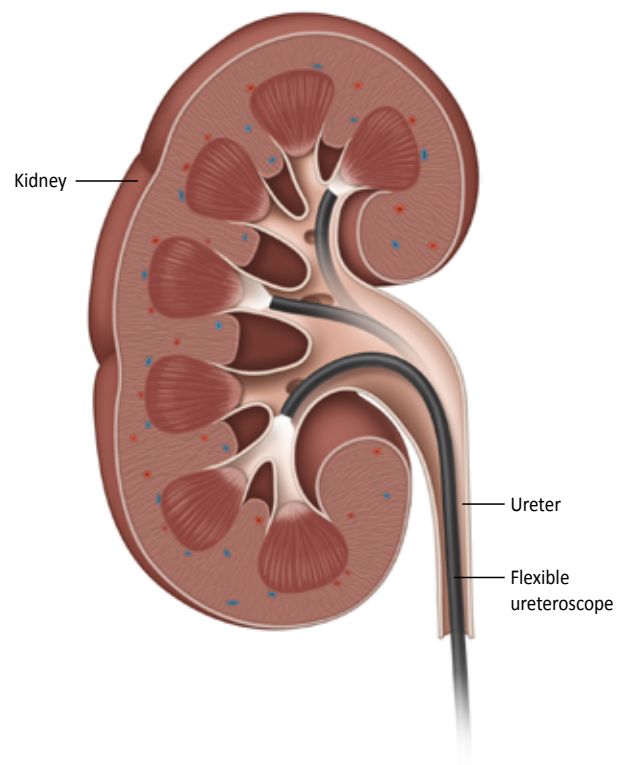
Procedures for treating larger kidney stones

Ureteroscopy

This procedure is used to treat small to medium-sized stones that are in the kidneys and the ureters.

A ureteroscopy doesn't involve making any cuts in your skin as the surgical tools are passed through your urethra (the tube which urine passes through) and into your internal urinary system. The procedure is carried out either while you are asleep under a general anaesthetic or while you are awake under spinal anaesthesia which numbs you from the waist down so that you do not feel anything.

A thin, flexible tube allows your doctor to reach all areas within the kidney




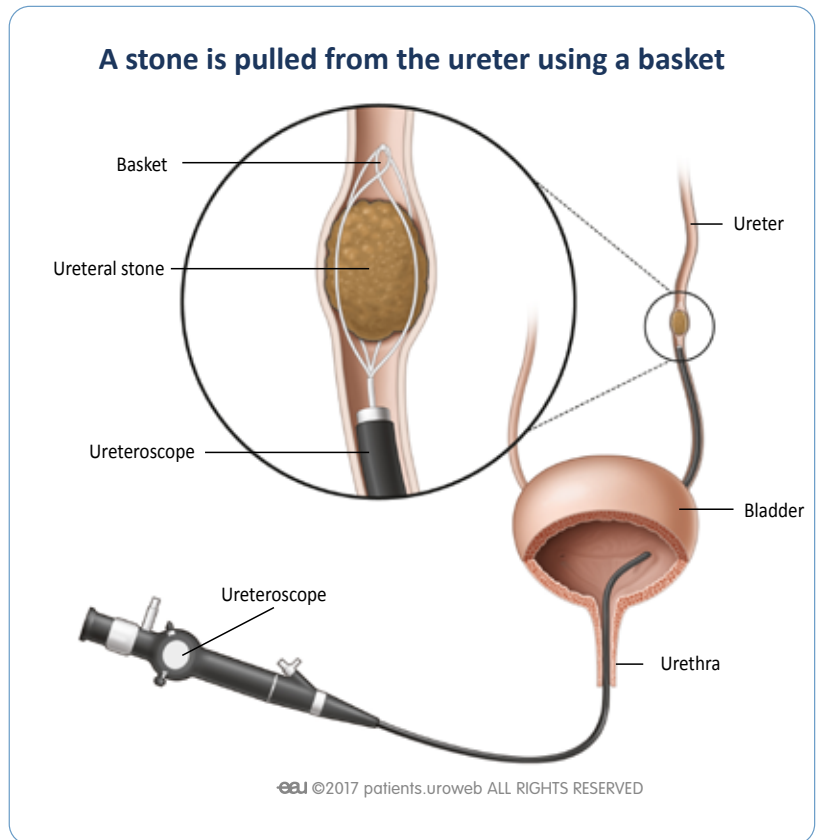
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The doctor uses a thin, flexible tube (called a 'scope') that is inserted through your urethra, bladder, and then the ureter and into your kidney. The thin tube has a tiny camera on the end which the doctor uses to find the stones. Surgical tools are then passed down the tube so that the doctor can remove any small stones.

If there are any larger kidney stones, the doctor will pass a laser through the scope to break the stones up into smaller pieces which they can then remove, or leave in place, to be passed out when you urinate.

After the procedure there may be a need to place a stent (a small plastic or silicone tube to help keep the ureter open so that urine can flow out) in the urinary system. This would only be temporary and would be removed by your doctor a couple of weeks after the procedure.

This animation shows what happens when you undergo a ureteroscopy. 



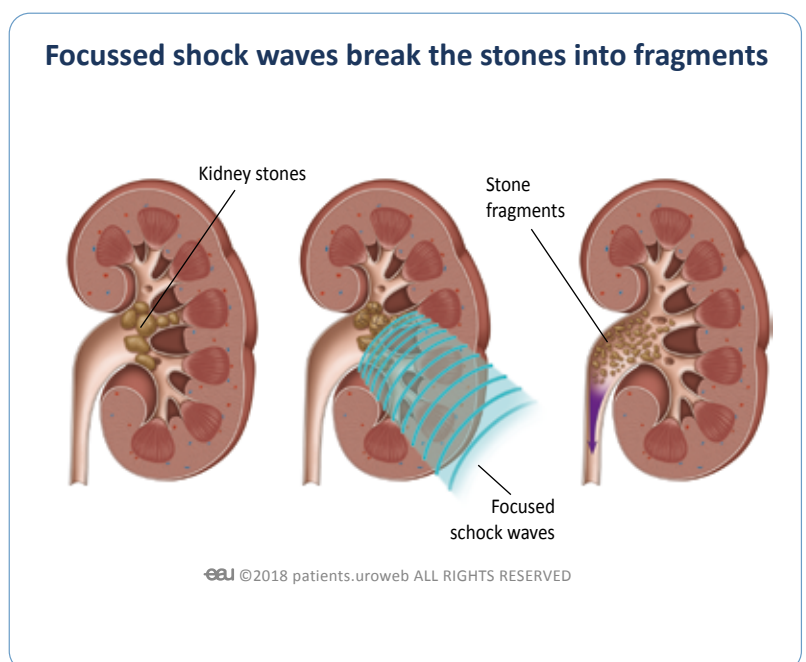
Shock-wave lithotripsy (SWL)

This procedure involves using sound waves from outside the body to blast the kidney stone into tiny pieces which can then be passed yourself when you urinate.


The procedure takes about an hour to do and is moderately painful, so you will be given pain medication. You may have it done under sedation, where you would be given medication to relax you, so you have limited awareness and recollection of the procedure. If you have a large stone, you may need several sessions to completely break it up.

Shock-wave lithotripsy is not recommended if you:

- Are pregnant;
- Have a high risk of severe bleeding;
- Have any uncontrolled infections;
- Have uncontrolled high blood pressure;
- Have a high body mass index which means that it would be difficult for the sound waves to reach the stone;
- Have an aneurysm;
- Have an anatomical obstruction in the urinary tract, below the stone, or in the bladder;
- Have a very hard kidney stone (for instance, cystine stones).



Your doctor will advise whether this type of procedure would be suitable for you and will discuss the risks and benefits of shock-wave lithotripsy in relation to your individual medical circumstances.

This animation shows what happens when you undergo shock-wave lithotripsy. 

Surgical procedures for treating more complex kidney stones


Percutaneous nephrolithotomy

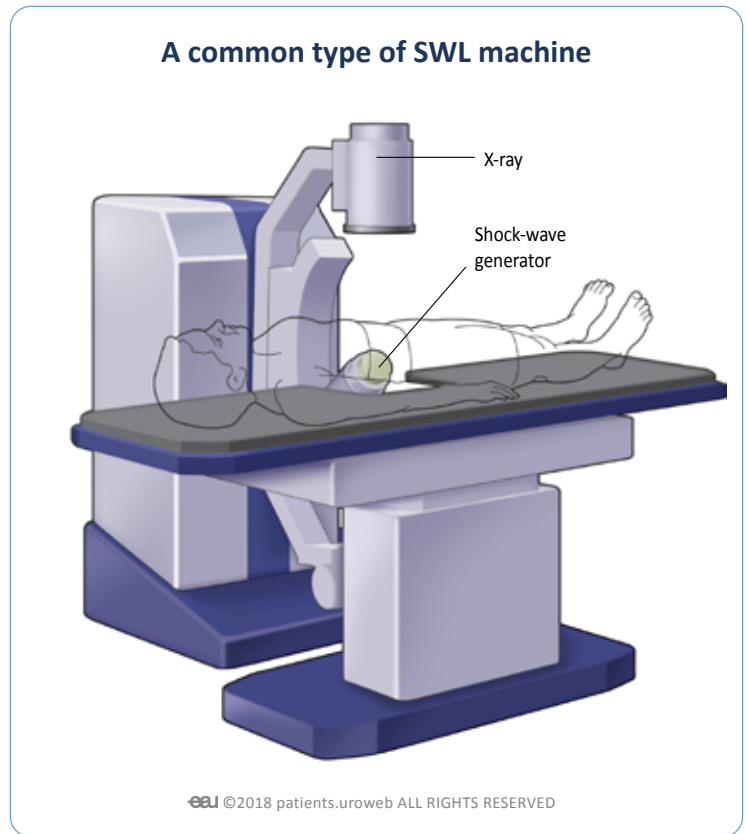
This type of operation is carried out when there are several kidney stones that are difficult to reach, or if they are too large to be treated by shock wave procedures or ureteroscopy.

During percutaneous nephrolithotomy, the doctor makes a small incision (cut) in your back and through into your kidney to reach and then surgically remove the stone(s).

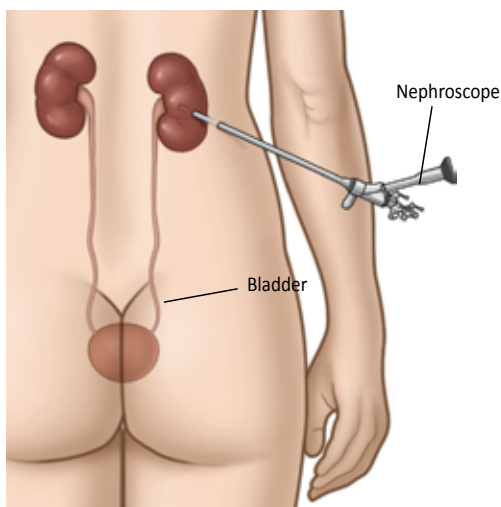
This type of surgery is carried out while you are asleep under a general anaesthetic. You will need to stay in the hospital until you can empty your bladder sufficiently and your pain is well-controlled.

After the procedure there may be a need to place a stent (a small plastic tube to help the flow of urine) in the urinary system and/or a thin tube from your kidney and out through the skin of your back, to collect urine into a drainage bag. These would only be temporary and would be removed by your doctor a few days after the procedure.

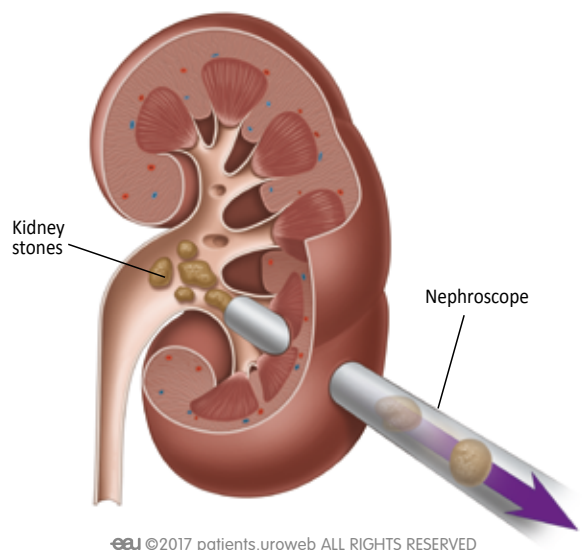
This animation shows what happens when you undergo percutaneous nephrolithotomy. 



A nephroscope is used to remove stones directly from the kidney



Stone fragments are removed in a single procedure with a nephroscope



What are the most common side effects of kidney stones treatments?

The side effects of kidney stone treatments depend on the size, type, and location of your kidney stone, as well as the type of treatment you have.

Your doctor will discuss with you any side effects and the risks and complications of each treatment type available to treat your kidney stone(s) when you are considering your options. This information will be specific to your individual circumstances and the exact medicine, procedure, or surgery being offered to you.

The below sections are for information purposes and provide examples of side effects that may be caused by some medicines and procedures/operations for treating kidney stones.

Side-effects of medicines

Medical expulsive therapy and dissolving medicines can cause dizziness or feeling light-headed, sinus congestion, or a runny nose. Dissolving medicines can also cause temporary changes in male ejaculation.

If you have a high temperature or are experiencing chills, are in a great deal of pain, cannot tolerate food or liquids, and have a large quantity of blood in your urine (or blood clots), you will need to contact your doctor straight away. These symptoms can indicate that you have an infection or that your kidney stones are causing problems that need to be addressed quickly.

Surgical side-effects and complications

Temporary side-effects of medical or surgical procedures to treat kidney stones include:

- A mild burning feeling when urinating for a few days after surgery;
- Mild discomfort in the bladder area or kidney area when urinating;
- Small amounts of blood in the urine for a few days;
- The need to urinate more frequently or urgently;
- Temporary discomfort or pain resulting from surgical tools being inserted into the urinary system;
- Pain, bleeding, and frequent urge to urinate if a stent has been placed.

Complications arising from medical procedures and surgery include:

- A urinary infection;
- Sepsis – a severe infection that can be extremely serious;
- Damage to the kidney or ureter during the procedure or surgery;
- Scarring or tightening of the ureter;
- Bleeding during surgery;
- A blocked ureter;
- Failure of the procedure to remove all of the kidney stone(s);
- The need for repeat surgery if there are multiple stones or a single kidney stone is too large to remove in a single surgery;
- Recurrence of kidney stones.

In rare cases, some people develop symptoms that require them to return to hospital after they have had a procedure or operation. These symptoms include:

- A fever above 38.5 degrees;
- Nausea or vomiting;
- Chest pain or difficulty breathing;
- A serious burning sensation when urinating;

- Inability to urinate;
- Large amounts of blood in your urine, which do not go away with rest or hydration;
- Prolonged blood in the urine, lasting more than 3 days;
- Continuing to have severe pain in your kidney, back, or side, despite taking painkillers;
- Inflammation, pus, or leaking around any surgical site.

If you have pain or bleeding that becomes worse after you have been discharged from the hospital, you will need to let your doctor know as soon as possible.

Signs of an infection include severe pain, fever, and chills. If you have these symptoms, you will need to contact your doctor **straight away**.

If an infection is suspected, your doctor will give you antibiotics to treat it. Severe infections can require you to return to the hospital for intravenous antibiotics (given via a needle in your arm so that they can get into your bloodstream more quickly).

You can increase your likelihood of having a good recovery following a medical or surgical procedure by doing the following:

- Drinking at least 1.5 litres of water (in small quantities) throughout each day to help with good urine flow, to flush out small kidney stone fragments and to prevent further kidney stones;
- Avoiding having sex for the first week after a procedure or surgery to avoid getting a urinary tract infection;
- Eating more vegetables, fibre and less meat to help with having softer stools – not straining on the toilet will help the internal healing process;
- Following your doctor's instructions for driving, rest and physical activities after a procedure or surgery;
- Taking only gentle exercise for the first week after a procedure or surgery to recover and heal and making sure that you get plenty of sleep.

Living with kidney stones

What is it like living with kidney stones?

Many people have very minor kidney stones that they are unaware of. Sometimes these are discovered when they have gone for a medical scan for a different reason. Other people may have very small stones that are flushed away in their urine without them noticing.

Generally, people do not live with kidney stones that are causing problems as these do require treatment. If you have any symptoms of a kidney stone, you should see your doctor straight away.

If left untreated, kidney stones can block the tubes from the kidneys to the bladder or make them narrower. This increases your risk of a kidney infection and there is also a risk that urine may build up and put a strain on your kidneys.

These problems are rare, however, because most kidney stones are treated before they can cause these types of complications.

How can recurrence of kidney stones be prevented?

If you are examined and are found to have kidney stones and your doctor thinks that you have a high risk of forming more kidney stones in the future, they will do a metabolic evaluation. This is a series of blood and urine tests to decide what additional treatment might be suitable for you. These treatments are mainly in the form of medication or dietary changes.

Even if the tests show that your risk of developing another kidney stone is low, you will be advised to make some lifestyle changes such as:

- Increasing your daily fluid intake to 2.5-3.0 litres, mostly in the form of water and drank steadily throughout the day;
- Adopting a balanced diet, with less salt, meat and alcohol and more vegetables and fibre to maintain healthy calcium levels and a lower intake of animal proteins;
- Maintaining a healthy body weight (a normal BMI) and ensuring you take adequate physical activity (exercising 2-3 times per week).

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