Extracorporeal shock wave lithotripsy (ESWL)

Information for patients
Urology
What are kidney stones?

Kidney stones are stone-like lumps that can develop in one or both of the kidneys. The medical name for stones in the kidneys is nephrolithiasis. If the stones cause severe pain, this is known as renal colic.

What causes them?

The waste products in the blood can occasionally form crystals that collect inside the kidneys. Over time, the crystals may build up to form a hard stone-like lump.

This is more likely to happen if you don't drink enough fluids, are taking some types of medication, or have a medical condition that raises the levels of certain substances in your urine.

Symptoms of kidney stones

Small stones may be passed out painlessly in the urine and may even go undetected. However, it is fairly common for a stone to block part of the urinary system, such as:

- the ureter – the tube connecting the kidney to the bladder
- the urethra – the tube urine passes through out of the body

If this happens, it can cause severe pain in the abdomen or groin and sometimes causes a urinary tract infection.

Why do I need lithotripsy?

Lithotripsy is one of the treatment options for kidney stones which your consultant has suggested would be suitable for you.
What does the treatment involve?

Lithotripsy is a treatment where shockwaves are passed through the skin into the body. The shockwaves are focused onto small areas to break the stone into small enough pieces to pass naturally.
What are the alternatives?

Alternatives include procedures under an anaesthetic using telescopic or keyhole surgery (ureteroscopy or percutaneous nephrolithotomy) to treat the stones directly. Another option would be for a period of observation, this would be suitable if the stones are of low clinical concern. Some small stones will pass out of your system naturally without any treatment. Rarely, open surgery is needed to deal with stones.

What should I expect on the day of treatment?

You should expect to be in the Urology Department for up to half a day. Please make sure you have had a light meal before attending, but ideally only drink fluids for the 2 hours before your treatment.

Radiology Department: X-ray

You will usually go to the Radiology Department first for an up-to-date x-ray. This will confirm that the stone is still there and that treatment is still required.
**Urology Department: Your medical history**

You will then need to go to the Urology Outpatient Reception to book-in.

A nurse will run through a brief medical questionnaire with you to ensure it is safe to proceed with your treatment. It is important that you let the nurse or surgeon know if you have any of the following:

- An artificial heart valve
- A coronary artery stent
- A heart pacemaker or defibrillator
- A recently implanted artificial joint
- A regular prescription for warfarin, rivaroxaban (Xarelto®), apixaban (Eliquis®), dabigatran (Pradaxa®), aspirin, clopidogrel (Plavix®), ticagrelor (Brilique®) or any other antiplatelet or anticoagulant drug
- A previous or current MRSA infection
- A bleeding disorder or tendency
- An abdominal aortic aneurysm or stent

We cannot proceed with lithotripsy if you are pregnant. If you think you are, or there is any chance you may be pregnant, please let the nurse know. If there is any doubt we will routinely perform a urine pregnancy test to make sure.

**Getting ready**

You will get changed into a hospital gown, and shown where to securely store your own clothes. There are patient lockers but it is not advisable to bring valuables into the hospital.

Before your treatment, you will be offered a choice of painkillers to take – usually an anti-inflammatory suppository or occasionally an injection. Under certain circumstances you may be given antibiotics, but this is not routinely required.
As with any procedure we need to seek your consent beforehand. Your surgeon will explain the treatment and the benefits and risks to you, and ask you to sign a consent form. If you have any concerns or questions about the procedure, or if there is anything you do not understand, please ask before signing the form.

**What happens during the procedure?**

The procedure will be explained by the nurse and the lithotripsy technician (sonographer) throughout. You will lie on the lithotripsy machine and be positioned according to the location of your stone. It can take a little time to get you into the ideal position to undergo treatment, and sometimes a combination of x-rays and ultrasound are used. Your treatment will be monitored throughout by the nurse and technician. Treatment usually lasts between 30 and 60 minutes depending on the size and location of your stone(s).

Once the treatment starts, you will often feel a sensation of being flicked by an elastic band as well as hearing a ticking noise. The treatment is started at a low intensity and increased to the level that you can tolerate. It may become more uncomfortable during the procedure and you may feel deeper discomfort at the site of treatment. More painkillers can be given during your treatment if required. If at any time you feel the treatment is too painful, let the team know so that we can reduce the intensity of the treatment, or stop it altogether.

**What happens after the treatment?**

You will be told how the treatment has gone, although it can take a few days for the stone to fragment completely. Repeat treatments may be necessary for some stones.

Let the nursing or medical staff know if you have any pain. It is advisable where possible to have someone collect you rather than driving home,
particularly if you have had painkilling injections as these can make you drowsy and unsafe to drive for a short time.

When you are dressed, you will be given a drink and will be expected to pass urine before leaving the department.

We will explain any likely side effects and possible complications, as well as a plan for what happens next. You may be offered painkillers to take home if you do not already have any. Occasionally, you may be given medication such as antibiotics.

**Are there any side effects or complications?**

Most treatments have some possible side effects. Although the complications listed below are well-recognised, most patients do not experience any problems.

**Common** (greater than 1 in 10 patients)

- Blood in the urine for a short time (up to a few days)
- Pain as small stone fragments pass – renal colic (around 20% patients)
- Bruising or blistering of the skin
- Need for repeat treatments (up to 40% patients depending on the type and size of stone)
- Failure to break very hard stones and/or the need for further treatment
- Incomplete treatment with small residual stone fragments left in the kidney

**Occasional** (between 1 in 10 and 1 in 50)

- Urinary infection due to bacteria released as the stone breaks
- Severe infection requiring hospital admission and intravenous antibiotics
• Severe infection with obstruction (blockage to the kidney) needing drainage of the kidney
• Obstruction (blockage) caused by stone fragments getting stuck in the tube between the kidney and the bladder (ureter) – this may require further lithotripsy or telescopic surgery

**Rare** (less than 1 in 50)

• Kidney damage with severe bruising or bleeding from the kidney needing further treatment

There is a small risk of hospital-acquired infection (e.g. MRSA, Clostridium difficile etc) with any visit to hospital, but these risks are significantly lower in an outpatient setting than in patients admitted to hospital. Such infections are not routinely a concern when we perform lithotripsy. If you have had any of these conditions, or have any concerns regarding hospital acquired infection, these can be discussed with the medical or nursing team at the time of your attendance.

**What should I expect once I get home?**

You will be given a contact number for the Urology Department in case of any concerns. Your follow-up will be explained, and appointments will be confirmed by letter.

We advise that you drink twice as much as you would usually do for the first 48-72 hours after treatment. This is to help minimise any bleeding and flush any small fragments of stone out. You should take painkillers as recommended and if you were given any antibiotics, you should always complete the prescribed course even if you feel well. Any skin changes such as bruising or blistering will disappear within 5-7 days. You may find that simple moisturising cream can help.
What else should I look out for?

If you experience any of the following symptoms you should contact your GP or the Urology Department immediately:

- A temperature or feel feverish
- Severe pain on passing urine
- Unable to pass urine at all
- Increase in the amount of bleeding

Under some of these circumstances it may be necessary to admit you to hospital for observation or urgent treatment.

If you develop pain from passing stone fragments or small blood clots (colic) you should contact your GP for stronger pain relief initially. If it does not settle, you may be referred back to the Urology Department.

Is there anything else I should know?

Follow-up plans will be made which may include further lithotripsy, x-rays or even surgery. If you have a ureteric stent in place, arrangements may be made for this to be removed under local anaesthetic in the Urology Clinic.

You can modify your diet to reduce the risk of stones in the future. More advice on this can be obtained from your consultant or resources online such as NHS Choices www.nhs.uk.

The best way of preventing kidney stones is to make sure you drink plenty of water and reduce your salt intake. Some stones require specific dietary advice.

Smoking can make some urological conditions worse and increases the risk of complications after surgery. For advice on stopping, contact your GP or the free NHS Smoking Helpline on 0800 1690 169.
Research and audit

There are occasions when we take part in research and you may be offered the chance to participate. If you do decide to take part in one of our studies, one of our specialist research nurses will contact you with further details. Research studies usually run alongside our normal practice, and you are always free to withdraw your consent to participate at any time.

All our treatments and procedures are subject to audit, this enables us to analyse our results and make comparisons with other professionals/teams. In this way we can ensure we are always providing the highest quality service to our patients and taking steps to further improve our techniques and results.

Who should I contact if I have any questions or concerns?

Please do not hesitate to contact the Urology Department prior to or following your treatment with any questions or concerns.

Urology Assessment Unit (Nursing Team)

- 0114 226 5149
  24 hours

Appointments

- 0114 226 1129
  8:00am - 4:00pm