University College Hospital at Westmoreland Street

Lithotripsy
Urology Directorate
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**Contents**

- What is lithotripsy? 5
- How can lithotripsy help me? 6
- Patient who should not have lithotripsy 7
- What are the risks of lithotripsy? 7
- What will happen if I choose not to have lithotripsy? 8
- What alternatives are available? 9
- What are the risks of a general anaesthetic? 11
- What are the risks of surgery? 11
- How should I prepare for lithotripsy? 12
- What happens during lithotripsy? 12
- What should I expect after lithotripsy? 14

References 15

Contact details 15

Where can I get more information? 15
**What is lithotripsy?**

The full name for this treatment is extracorporeal shock wave lithotripsy (ESWL). In this leaflet, we refer to ESWL as “lithotripsy” as this is the more commonly used shortened version.

Lithotripsy is the use of shock waves to break up stones in the kidneys and ureters (the tubes that carry urine from your kidney to your bladder). When stones break up, they are easier to pass them out of the body in your urine. The shock waves are high-energy pressure waves which are produced outside the body by a special machine called a lithotripter (“extracorporeal” means outside the body). The waves are produced in a water cushion and aimed at the stone. They pass through the body until they reach their target. The shock waves should not cause significant damage as they pass through your body. When they reach the stone, their energy is released which causes the stones to break up into smaller fragments. About 3,000 shock waves are used during a treatment session. The treatment can be uncomfortable and occasionally painful. However painkillers are given before treatment to help to minimise this.
How can lithotripsy help me?

Lithotripsy can help you to pass your stone(s) without having to have surgery. Urinary stones can cause considerable pain and can sometimes lead to more serious complications.

The chance of lithotripsy treatment being successful depends on the number, size and location of your stones. Lithotripsy is usually very effective for most small stones enabling you to pass them without further treatment. Large stones will need an alternative procedure (see section “What alternatives are available?”).
Patient who should not have lithotripsy

- Patients who are pregnant;
- Patients on anticoagulants (blood thinners) e.g. warfarin, clopidogrel;
- Patients who have a stone completely obstructing (blocking) the ureter;
- Patients who have a cardiac pacemaker;
- Patients who have recently had a heart attack;
- Patients who are about to take a flight within ten days of treatment;
- Patients with untreated hypertension (high blood pressure);
- Patients who have had surgery on the aorta (the large artery which carries blood from the heart).

What are the risks of lithotripsy?

All treatments and procedures have risks and we will talk to you about the risks of lithotripsy before you decide to have the treatment.

The main risks that can occur following lithotripsy include:

- Not all stone fragments will be passed.
- Fragments of stone can remain in the ureter and may stop the flow of urine. We call this partial obstruction (where some urine can still get through) or complete obstruction (where the ureter is completely blocked and no urine can drain into the bladder). If a fragment causes a complete obstruction sometimes it is necessary to place a tube through your back and into the kidney. This allows urine to drain out through the tube into a bag until the fragments of stone have passed down the ureter. Alternatively, a tube called a JJ stent may be put in to by pass the fragment that is blocking the ureter. The stent stretches from the kidney down the ureter and into the bladder. This will allow the urine to drain down the ureter through the stent until the fragment is passed. Further treatment may be required to remove these fragments if you are unable to pass them naturally after a few weeks.
• Bleeding around or in the kidney. This is like a bruise and called a heamatoma.

• Infection can occur. Signs of infection include: a high temperature, flu like symptoms and feeling of hot and cold.

• Allergic reaction to the medicines used before or after the treatment.

• Stones forming again (reoccurrence).

The risks of the treatment will be increased if you are overweight, have hypertension (high blood pressure), or take anticoagulants.

If you experience any symptoms that concern you after lithotripsy, contact your GP or your hospital consultant’s secretary. If you have severe symptoms, such as severe, colicky pain, lasting for more than six hours go to your nearest Accident and Emergency department and take this leaflet with you.

**What will happen if I choose not to have lithotripsy?**

If you choose not to have lithotripsy, we will talk to you about your options. You may wish to “wait and see” if the stones are very small or consider alternative treatments. These include telescopic removal and keyhole surgery (see next section).

Stones that form in the kidney may only cause minimal discomfort. However, they can cause blockage, infection, bleeding and/or pain. It is possible that untreated stones may increase in size causing significant problems later on such as loss of kidney function. You should ensure that you are fully aware of the risks of not having lithotripsy.
What alternatives are available?
Your doctor will discuss if any of the alternatives are a suitable treatment for you. This will depend on your condition and general state of health. These are surgical procedures and a general anaesthetic is required which means there are additional risks.

Telescopic/endoscopic removal

Stones in the ureters and bladder can sometimes be removed using an endoscope, a thin tube with a telescope at the end passed up through the bladder and into the ureter. A “grabbing” tool can be passed down this tube to come out at the other end and grab the stone. In some cases a laser is used through the endoscope to break stones first before using the grabbing tool to remove them. It tends to be used for hard stones. Endoscopic treatment of stones is not always possible and there is a greater risk of infection.
Percutaneous Nephrolithotomy

This is a keyhole approach where we make a small 1 cm hole in the back and place the endoscope directly into the kidney. Tools can then be passed down the endoscope to break the stones. The fragments are removed piece by piece with a grabbing tool until all the stones are removed.

Open removal
Some stones can only be removed with traditional open surgery. This is rare today but in some circumstances it is the most effective way to remove stones.
What are the risks of a general anaesthetic?
There are a number of factors that affect the chances of suffering complications from anaesthesia; these may include age, weight, smoking, lifestyle and the general state of your health. Your anaesthetist and/or your surgeon can provide further details. The following information on risks is provided by the Royal College of Anaesthetists.

Very common (one in 10) and common (one in 100) side effects: Feeling sick and vomiting after surgery, sore throat, dizziness, blurred vision, headache, itching, aches, pains, backache, pain during injection of drugs, bruising and soreness, confusion or memory loss.

Uncommon (one in 1000) side effects and complications: Chest infection, bladder problems, muscle pains, slow breathing (depressed respiration), damage to the mouth, an existing medical condition getting worse, awareness (becoming conscious) during operation.

Rare (one in 10,000) or very rare (one in 100,000 or less) complications: Damage to the eyes, serious allergy to drugs, nerve damage, death.

Death from anaesthesia is very rare, and is usually caused by a combination of four or five complications together. In the UK there are approximately about five deaths for every million anaesthetics.

What are the risks of surgery?
The main risks of surgery are:

- Bleeding during the operation. Occasionally a patient may need to have a blood transfusion if more blood has been lost than usual.
- Urine Infection;
- Wound infection;
- Perforation of bladder or ureter.
How should I prepare for lithotripsy?
It is important to eat, and drink as normal. So **do not** come starved.
Take any medications that you would normally take as usual.
**Please bring a spare pair of underwear with you. Your underwear will become wet by warm water placed between your back and the treatment couch.**

What happens during lithotripsy?
Lithotripsy treatment may take up to three treatment sessions (with gaps of up to three weeks in between. These vary from patient to patient) to fully break a stone. The stone hardness dictates how much fragmentation is achieved at each visit.

Expect to be with us for two hours. As you may feel little unsteady after the treatment, bring someone with you on your first visit to escort you home afterwards. After your first treatment, most people find that an escort is not needed.

Figure 5: Image courtesy Mediline Plus
When you arrive at University College Hospital, take the Tower lifts to the second floor. Follow the signs to the day surgery unit and once inside report to reception for the lithotripter unit. Ring the buzzer on the door and someone will allow you in to reception. Show them your appointment letter and they will explain what to do next.

We do our best to keep to appointment times. However we cannot predict exactly how long each treatment will take, so your treatment may not start exactly on time. It is a good idea to bring something to read with you; however we strongly advise you not to bring any valuables into the hospital. UCL Hospitals NHS Foundation Trust cannot accept responsibility for your belongings.

On your first visit we will need you to complete a questionnaire, so that we have your up to date details of address, GP and telephone numbers.

Before your treatment starts, we will ask you to change into a hospital gown. We will also give you a paracetamol suppository to insert into the back passage which will help reduce pain.

When you are ready, we will ask you lie on the lithotripter table. We then put some warm water under your back to remove the air under you.

Using ultrasound or X-rays, we will find the exact location of your stone(s). We will then start the treatment. You will notice a clicking sound with each shockwave and you will be able to feel them in your body. This is a strange sensation, and may be uncomfortable, with a slight feeling of pain. We ask you to let us know during the treatment how you are feeling. Let us know your experiences and if you have any worries.

The treatment will take about 40 minutes to an hour to complete. When it is finished, you can dry off and get changed. We will check that you are feeling well and give you a drink.
What should I expect after lithotripsy?
After having your treatment, go home and relax for the rest of the day. If you feel like it you can go back to work. Avoid heavy household tasks. Return to normal activities when you feel ready to—for most people this is usually the next day.

Drink plenty of water after your treatment. This will help you to pass any fragments of stone and help prevent further stones forming. Most people should drink at least two litres of fluid a day—that is about eight to ten cups. Passing stone fragments can be painful and can make you feel sick (nausea). Drinking plenty of water and taking simple painkillers (like paracetamol or aspirin tablets) will help relieve these symptoms.

We would recommend you use a sieve (like a tea strainer) when passing urine to catch any stone fragments. These stones can then be brought with you to clinic to give to your doctor so for stone analysis.

It is normal to have some blood in the urine after the treatment for a number of days. The blood usually becomes more dilute as each day passes and is nothing to worry about. If you are still passing heavy blood three to four days after the treatment and are concerned about the amount of blood in your urine, seek medical advice.

We sometimes feel it is necessary to give you antibiotics to take for a few days. Please let us know if you are allergic to any medicines or if you have asthma.

We will give you details of your next clinic appointment after your treatment or we will send them to you in the post. Please check that we have your correct contact details. If the lithotripsy machine breaks down we will do our best to contact you to save you a wasted journey. Without a mobile telephone number this is often difficult so please provide us with one if you have a mobile phone.
References

Some other information used in this leaflet has been obtained from the National Institute for Health’s (USA) Medical Encyclopedia article on lithotripsy: www.nlm.nih.gov/medlineplus/print/ency/article/007113.htm and www.doctoronline.nhs.uk/masterwebsite1asp/targetpages/specialts/urology/lithotri.asp

Contact details
Sonographer in Charge
Switchboard: 0845 155 5000
020 3456 7890
ext 70230

PA to the stone unit
Direct telephone: 020 3447 9179
Fax: 020 3447 9303

Where can I get more information?
National Kidney Federation (UK)
Telephone: 0845 601 0209
Website: www.kidney.org.uk

Kidney Research UK
Telephone: 0845 070 7601
Website: www.kidneyresearchuk.org

NHS Direct
Telephone: 0845 46 47
Website: www.nhsdirect.nhs.uk