



York and Scarborough
Teaching Hospitals
NHS Foundation Trust

Extracorporeal Shockwave Lithotripsy (E.S.W.L.)

For Urinary Stones

Information for patients, relatives and carers

Department of Urology

① For more information, please contact:

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What is shockwave lithotripsy (or ESWL)?

This involves the administration of shockwaves through the skin to fragment urinary tract stones into small enough fragments to pass naturally. The procedure involves either x-ray or ultrasound scanning to find and localise the stone(s).

Will the procedure harm me in any way?

The technique was introduced several decades ago and has been used successfully on millions of patients worldwide. The shock waves produced by a special machine travel through the body and cause virtually no harm to the kidney and surrounding organs.

How does it work?

The shock wave focuses on the stone, which is usually made up of hard brittle crystalline substances and causes them to disintegrate into smaller fragments, similar to sand, which is then passed into the urine.

What are the alternatives to this procedure?

Flexible Ureteroscopy, telescopic (percutaneous) surgery, open surgery, observation to allow spontaneous passage.

What should I expect before the procedure?

- You will see a member of the urology team. You will be sent an invitation to attend as a day case or in special circumstances as an inpatient, which will have been discussed with you.
- You may eat a light breakfast before admission but we recommend that you avoid foods that can cause internal gas.
- You must arrange for someone to take you home by private transport.
 - If you are aware that you have an enlarged aorta (large blood vessel in your abdomen) which is also known as an aortic aneurysm, then please inform the staff, as this treatment may not be appropriate for you.
- You may be asked to go for X-ray on the day prior to your treatment or on the same day as your treatment.

You will then see the consultant or the staff nurse with your X-ray who will answer all your questions.

- You will need to sign a consent form for the procedure to be done (FYCON82-1 Extracorporeal Shockwave Lithotripsy). Usually this will be organised by the Doctor or Staff Nurse on the ward. The form will be kept in your Patient Notes and you will also be given a copy for your own records.
- The nurse will check your details and prepare you for the procedure. You will be asked to change into a theatre gown.
- Treatment can last between 30 and 60 minutes.
- You will be given an antibiotic tablet and pain relief either by mouth or with suppositories about an hour before treatment.
- You must not have this treatment if you are pregnant. If are pregnant or suspect you are pregnant, please let us know. Women of childbearing age will be asked to do a urine sample for pregnancy testing. Only negative ones will proceed. If you refuse to take the test we will cancel your treatment.
- Please expect to be at the hospital on the day of treatment for four to six hours.
- We will answer any questions at any time during your stay.

Do I need to stop any medication I am taking before the procedure?

If you are taking **warfarin**, please inform your doctor and they will refer you to the pre-assessment nurses. You must stop taking warfarin five days before treatment as it can cause excessive bleeding. You will have an INR blood test just before your treatment to confirm that it is safe to proceed. If you are at high risk of a blood clot while not taking warfarin you may need to have injections during this period. The last injection will be on the morning of the day before the procedure and they will be restarted after the procedure until your INR is in range.

If you are taking the newer anticoagulant medications e.g. **apixaban, dabigatran, edoxaban** and **rivaroxaban** please inform your doctor and they will refer you to the pre-assessment nurses. They will look at your kidney function then decide when exactly you should stop these tablets. Usually this will be between three to five days before your procedure. You will restart these medications 48 hours after the procedure as long as you are considered to be at a lower risk of bleeding. If you are at high risk of a blood clot while not taking your medication you may need to have injections **after** the procedure until it is safe to restart your anticoagulant.

If you are taking antiplatelet medications e.g. **aspirin**, **clopidogrel**, **prasugrel** or **ticagrelor** please inform your doctor and they will refer you to the pre-assessment nurses. Depending on why you are taking them will determine the action to be taken. If you have recently had a coronary stent and you are taking two antiplatelet agents you may have to wait before lithotripsy can be done. The pre-assessment nurses will discuss this with your cardiologist.

You may take all other medication as normal.

What happens during the procedure?

In the treatment room you will be positioned on a special table by the radiographer and the position of the stone checked by ultra-sound or by x-ray imaging.

The shock wave generator is then placed next to the skin on to which a special gel is applied and shock waves are produced.

You must remain absolutely still throughout the treatment.

If there is any discomfort please tell the radiographer. You may be offered an additional analgesia injection if it is very painful.

You will remain fully conscious throughout the treatment.

What happens immediately after the procedure?

Immediately after the treatment, you may feel quite drowsy.

You will walk or be transported back to the ward.

You will be offered light refreshments and a jug of water. You are encouraged to drink sufficient volumes of fluids during the next few days so that you are able to produce around two to three litres of urine per day. This will encourage elimination of the stone fragments.

You will be given a three day course of antibiotics and analgesic tablets to take home, which usually are sufficient to control the discomfort.

As soon as you have recovered from the treatment, you will be able to go home but you must bring someone with you to escort you home; you should not attempt to drive yourself because of the effects of the sedation.

The average hospital stay is less than a day.

Are there any risks or side-effects?

Most procedures have a potential for side-effects. You should be reassured that, although all these complications are well-recognised, the majority of patients do not suffer any problems after a urological procedure.

Common (greater than 1 in 10)

- Bleeding on passing urine for a short period after the procedure.
- Pain in the kidney as small fragments of stone pass after treatment (20%).
- Urinary tract infection due to bacteria released from the stone during fragmentation, requiring antibiotic treatment (10%).
- Bruising or blistering of the skin in the loin or on the front of the abdomen.
- Need for repeated ESWL treatments (15-20%).
- Failure to fragment very hard stone(s) requiring an alternative treatment (less than approximately 14%).

Occasional (between 1 in 10 and 1 in 50)

- Stone fragments occasionally get stuck in the tube between the kidney and the bladder requiring hospital attendance and, occasionally, surgery to remove the stone fragments. This may include the temporary placement of a Stent that can cause pain, blood in the urine and changes in urinary frequency; as well as a separate procedure to remove this.

Rare (less than 1 in 50)

- Severe infection requiring intravenous antibiotics (less than 1%) and sometimes drainage of the kidney by a small drain placed through the back into the kidney
- Kidney damage (bruising) or infection needing further treatment
- Recurrence of stones (less than 1%)

Hospital-acquired infection

- Colonisation with MRSA (0.9% - 1 in 110)
- Clostridium difficile bowel infection (0.2% - 1 in 500)
- MRSA bloodstream infection (0.08% - 1 in 1250)

The rates for hospital-acquired infection may be greater in high-risk patients e.g. with long-term drainage tubes, after removal of the bladder for cancer, after previous infections, after prolonged hospitalisation or after multiple admissions.

What should I expect when I get home?

By the time of your discharge from hospital:

- You should be given advice about your recovery at home.
- Most people prefer to take the next day off work.
- There are no restrictions in sexual intimacy.
- Ask for a contact number if you have any concerns once you return home.
- You will usually be sent an outpatient appointment for an appointment some 2 to 4 weeks later. You will have a further X-ray, CT scan or Ultrasound to follow up the effect of the treatment on the stone.

When you get home, you should drink twice as much fluid as you would normally to flush your system through and minimise any bleeding or infection. Painkillers should be taken as necessary and you must complete the course of antibiotics.

Some blood in the urine is normal for 48-72 hours. In some instances it can continue for a week or so, but this usually clears up without undue problems. If you develop bruising/blistering in your loin or on your abdomen, simple skin creams will usually ease any discomfort and the bruising normally resolves within seven days.

ESWL has a high success rate but this depends on the size of the stone and its position in the kidney. Therefore it is not unusual to require more than one treatment.

What else should I look out for?

If you develop a fever, severe pain on passing urine, inability to pass urine or worsening bleeding, you should contact your GP or attend the Emergency Department at your nearest hospital immediately. Small blood clots or stone fragments may also pass down the ureter from the kidney, resulting in renal colic; in this event, you should contact your GP immediately or attend the Emergency Department at your nearest hospital.

Are there any other important points?

You will be informed before your discharge of any follow-up arrangements. This will usually involve either further lithotripsy, operative surgery or a simple follow-up outpatient appointment when a further X-ray will be taken.

If you have a stent in place, you may be given an appointment for removal of the stent in the Day Surgery Unit under local anaesthetic if this is appropriate.

You can prevent further stone recurrence by implementing changes to your diet and fluid intake. If you have not already received a written leaflet about this, contact your named nurse, the Specialist Nurse in outpatients or your Consultant.

Driving after surgery

It is your responsibility to ensure that you are fit to drive following your surgery. You do not normally need to notify the DVLA unless you have a medical condition that will last for longer than three months after your surgery and may affect your ability to drive. You should, however, check with your insurance company before returning to driving. Your doctors will be happy to provide you with advice on request.

Useful Contact Numbers

Day Unit: 01904 726010

Day Unit Appointments: 01904 725126

Tell us what you think of this leaflet

We hope that you found this leaflet helpful. If you would like to tell us what you think, please contact: Mr Richard Khafagy, Consultant Urological Surgeon, The York Hospital, Wigginton Road, York, YO31 8HE, telephone 01904 725985 or email Richard.Khafagy@york.nhs.uk.

Teaching, training and research

Our Trust is committed to teaching, training and research to support the development of health and healthcare in our community. Healthcare students may observe consultations for this purpose. You can opt out if you do not want students to observe. We may also ask you if you would like to be involved in our research.

Patient Advice and Liaison Service (PALS)

PALS offers impartial advice and assistance to patients, their relatives, friends and carers. We can listen to feedback (positive or negative), answer questions and help resolve any concerns about Trust services.

PALS can be contacted on 01904 726262, or email pals@york.nhs.uk.

An answer phone is available out of hours.

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Owner	Mr R Khafagy, Consultant Urological Surgeon
Date first issued	January 2011
Review Date	February 2025
Version	4 (issued March 2022)
Approved by	Urology Clinical Governance Meeting
Linked to consent form	FYCON82-1 Extracorporeal Shockwave Lithotripsy v5
Document Reference	PIL 675 v4

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