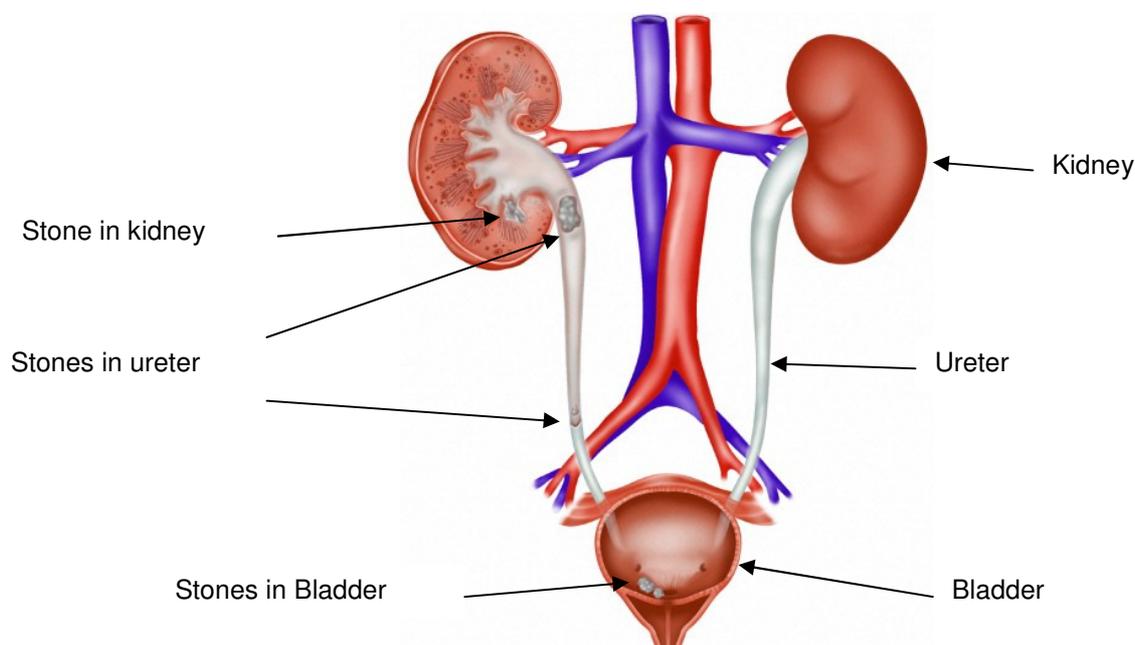


A Diagram of the Kidney, Ureters and Bladder



Kidney stones are slightly more common in males than females. They can be caused by a low fluid intake, hot environment causing dehydration, high salt and protein intake are other possible factors along with metabolic abnormalities in the blood or urine such as a high calcium oxalate, uric acid or cysteine levels. Kidney stones can be made of calcium, uric acid, magnesium ammonium phosphate (infection stones), cysteine, oxalate and brushite.

Kidney Stones can be asymptomatic or cause pain (renal colic). They tend to cause pain when they move into the ureter (the tube that runs between the kidney and the bladder). Most stones will pass out of the ureter if they are less than 5 mm in size. However if they are larger than this they may obstruct the ureter and cause a blockage to drainage of the kidney or kidney infection and or pain. Larger stones in the kidney may cause recurrent infections and possibly cause a loss of kidney function over time.

Stones are generally diagnosed by xrays / ultrasound scan of the kidneys or alternatively with a CT scan (CT KUB).

Your doctor may choose to send the stone for biochemical analysis if this is collected after spontaneous passage or after surgery. Your doctor may also wish to perform some blood and urine tests to determine the nature of the stone.

The treatment of the kidney stone or ureteric stone depends on its size, its position and what symptoms it is causing.

In general smaller stones can be observed or they can be treated with shockwave treatment (Extracorporeal shockwave lithotripsy – ESWL). If they are too large for shockwave treatment (ESWL) they may require surgical removal with a small thin telescope (ureteroscope) which is passed up to the kidney via the bladder. If the stone is too large to remove by this method then a small cut can be made through the loin (back) and the stone removed through a small tract with a small telescope – Percutaneous nephrolithotomy (PCNL).

Some stones may require medical treatment to dissolve them (uric acid stones) and some may require a combination of medical therapy and surgery (cysteine stones).

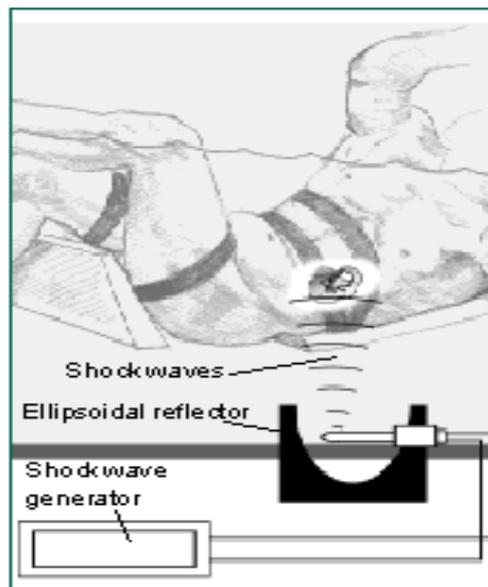
Extracorporeal Shockwave lithotripsy (ESWL)

Lithotripsy was first used in Germany in 1984 by Chaussy and colleagues. They used a Dornier HM3 lithotripter which was very powerful and patients had to be given a general anaesthetic during treatment.

As technology has advanced lithotriptors cause less pain and therefore treatments can be carried out with the patient awake.

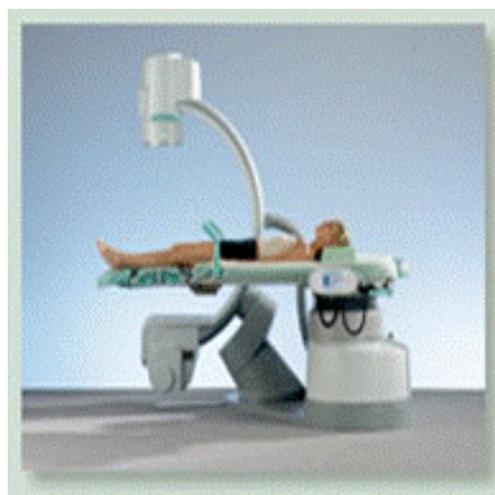
Lithotripsy breaks the stone via shock waves generated by the lithotripter.

The shock wave may be generated via 3 mechanisms i.e spark gap, electromagnetic, and piezoelectric. The shock wave is targeted onto the stone causing the stone to break.



Shockwave generation method

Analgesia is usually given during the procedure. The stone will not pass immediately but over the next few days to weeks. Occasionally more than one treatment is required to break the stone. If the stone does not break with lithotripsy surgery may be necessary. Very small (less than 5mm) and very large stones (greater than 2cm) are usually not suitable for lithotripsy. However your Urologist will advise you regarding the best form of management when he reviews you.

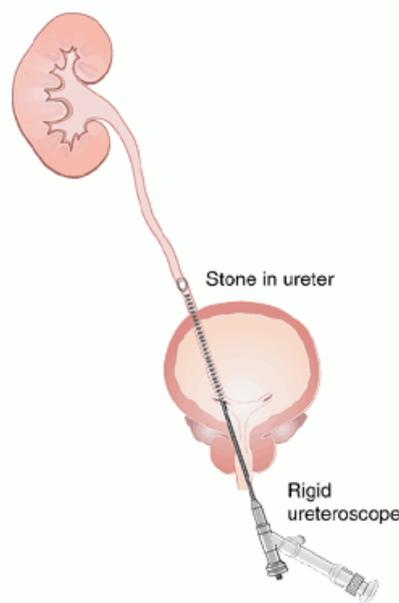


Lithotripter Machine

If lithotripsy fails or is not appropriate as a first line treatment a surgical approach may be necessary. This usually involves a spinal or general anaesthetic. The type of surgery selected will depend on the size and position of the stone.

Surgery can either be with a rigid / flexible camera called a ureteroscope which is passed upwards from the bladder into the ureter or kidney.

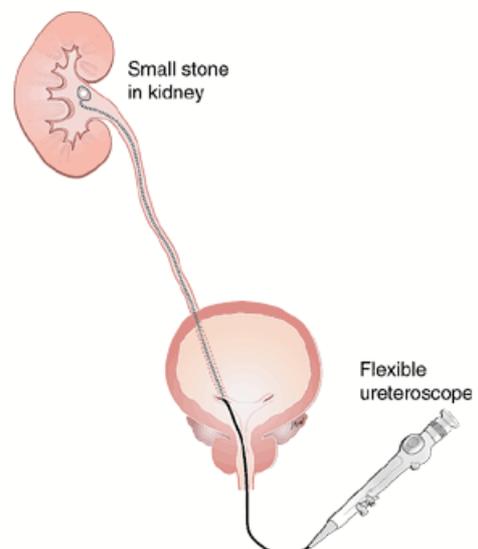
Rigid ureteroscopy involves the passage of a thin rigid scope through the urethra and via the bladder into the ureter (the ureter is the tube that runs from the kidney to the bladder). This is usually necessary to treat a stone in the mid or lower ureter which has not responded to shockwave treatment. It may also be necessary when the stone is causing a significant obstruction to kidney drainage. This procedure can be done under a general anaesthetic as a day case procedure. There is minimal morbidity however your doctor will advise you about the benefits and risks of surgery when he reviews you in his clinic.



Flexible Ureteroscopy

This involves the passage of a flexible thin scope through the urethra and bladder and into the ureter and into the kidney. This is used for stones that may not be suitable for lithotripsy and rigid ureteroscopy. Again there is minimal morbidity associated with the procedure and it is usually done under a general anaesthetic. Your doctor will explain the procedure in more detail to you when he sees you in the clinic.

The pictures below show a flexible ureteroscope.

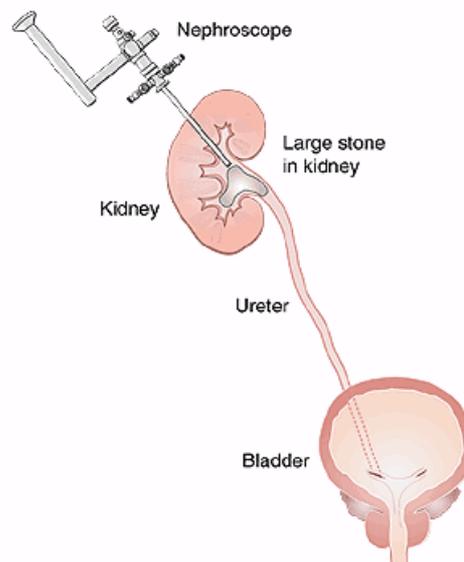


Percutaneous Nephrolithotomy (PCNL) (PCNL)

This surgery is performed for stones that are not suitable for other treatment options such as lithotripsy and or ureteroscopy.

It is performed under a general anaesthetic and involves a small tract being made through the skin in the loin and a small sheath introduced between the skin and the kidney. A small scope is then passed through this sheath into the kidney allowing the stone to be removed usually after it has been broken into smaller pieces with a special ultrasound probe / lithoclast and occasionally laser. A small tube (nephrostomy) is usually left draining the kidney for several days after the procedure. This is removed before you go home. Your Urologist will explain whether you are suitable for the procedure with you at the time of your consultation and also the benefits and risks of the procedure.

The diagram below demonstrates the scope being inserted into the kidney.



For an appointment to see Mr A Raza (Consultant Urological Surgeon – Endourologist / Laparoscopic Renal Surgeon) please click on the link below

[Mr Asif Raza](#)