Kidney stones

This fact sheet is for people who have presented to the emergency department with this condition.

This fact sheet provides general information. If you have specific concerns, speak to your healthcare professional for further information and advice.

What are kidney stones?

Kidney stones are hard stones that can cause severe pain in your side. They may also cause blood in your urine and nausea or vomiting.

You are more likely to develop kidney stones if you:

- eat a Western diet
- don't drink enough fluids
- are overweight.

Once you have had one episode, they are likely to recur, but there are several treatment options available.

Our kidneys remove many different chemicals from our body. This is really important to keep us healthy. These chemicals are passed from our kidneys to our bladder and out of our body. Occasionally these chemicals can join and form kidney stones.

Complications from kidney stones are uncommon. Rarely, a large stone can completely block the urine passing down one of the tubes (ureters) draining urine from the kidney. This may lead to infection or even damage to the kidney.

This is now very uncommon because X-rays or scans will usually detect any blockage so that large stones can be removed before they cause any damage to your kidneys.

Symptoms

For some people, a kidney stone may just stay in a kidney and cause no symptoms. Other kidney stones may travel out of your body in your urine without you knowing anything about it.

If symptoms do occur, they include:

- **Pain from a kidney**: A stone that is stuck in a kidney may cause pain in the side of your abdomen (loin). This pain can be very severe and cause you to feel sweaty and be sick (vomit).
- **Renal colic**:
  - This is a severe pain which is caused by a stone that passes into the tube (the ureter) draining urine from the kidney.
  - The stone becomes stuck. The ureter squeezes the stone towards the bladder, which causes intense pain in the side of your tummy (abdomen).
  - The pain caused by renal colic may last from a few minutes to a few hours. The pain comes in spasms and between these spasms there may be intervals of no pain or just a dull ache.
  - The pain may spread down into the lower abdomen or groin. You may sweat, feel sick or even vomit because the pain can be very bad.
- **Blood in your urine**: You may see blood in your urine (the urine turns red). This is caused by a stone rubbing against the inside of your ureter.
- **Urine infection**: Urine infections are more common in people with kidney stones. Urine infections may cause high temperature (fever), pain on passing urine (dysuria) and a need to pass urine more often.

Causes

You are more likely to form a kidney stone if your urine is concentrated. For example, if you:

- exercise vigorously
- live in a hot climate
- work in a hot environment, when you may lose more fluid as sweat and less as urine.

You are also more prone to develop kidney stones if you have:

- repeated (recurrent) urine infections
- repeated (recurrent) kidney infections
- an abnormal kidney – for example, with scars or cysts on it
- a close relative who has had a kidney stone.

In a small number of cases, a medical condition causes the kidney stone. Some health conditions can lead to high levels of chemicals in the body, such as calcium, oxalate, uric acid and cystine. If the level of these chemicals is high enough in the urine, they can form into stones.

Taking certain medicines can make you more prone to making kidney stones. Examples include:

- water tablets (diuretics)
- some chemotherapy medicines for cancer
- some medicines used to treat HIV.

However, many people safely take these medicines without developing kidney stones. If you think that a medicine you are taking is the cause of your kidney stone, you should not stop taking the medicine, but discuss it with your doctor.

Treatment

Most stones that cause renal colic are small and pass out with the urine in a day or so. You should drink plenty of fluids to encourage a good flow of urine.

Strong pain killers are often needed to ease the pain until you pass the stone. No other treatment is usually needed.

Some stones become stuck in a kidney or in one of the tubes (the ureters) draining urine from a kidney and cause persistent symptoms or problems.

In these cases, the pain usually becomes severe and you may need to be admitted to hospital. There are various treatment options which include the following:

- **Extracorporeal shock wave lithotripsy (ESWL)** uses high-energy shock waves which are focused on the stones, from a machine outside the body, to break up stones. You then pass out the tiny broken fragments when you pass urine.
- **Percutaneous nephrolithotomy (PCNL)** is used for stones not suitable for ESWL. A thin telescope-like instrument (a nephroscope) is passed through the skin and into the kidney. The stone is broken up and the fragments of stone are removed via the nephroscope. This procedure is usually done under general anaesthetic.
- **Ureteroscopy** is another treatment that may be used. In this procedure, a thin telescope is passed up into the ureter via the urethra and bladder. Once the stone is seen, a laser is used to break up the stone. This technique is suitable for most types of stone.

- **Surgery** to remove the stone. This is only needed in a very small number of cases where the above, newer techniques have not worked or are not possible. It may be done if you have a very large stone in your kidney.

Another option for a stone which is made purely from uric acid (about 1 in 20 stones), is to dissolve the stone. This can be done by drinking plenty of fluids and making the urine alkaline with medication.

Investigations

Kidney stones are common, and they are not caused by any known underlying disease for most people. However, some tests may be recommended to rule out an underlying problem.

In particular, tests are more likely to be advised if:

- you have repeated (recurring) kidney stones
- you have symptoms of an underlying condition
- you have a family history of a particular condition
- a stone forms in a child or young person.

You may be asked to catch a stone so that it can be analysed. This will help to find out if there may be an underlying cause for the kidney stone.

To catch a stone, you will need to pass urine through gauze, a tea strainer or a filter such as a coffee filter.

Home care

There are various treatment options to remove a stuck stone. About half of people who have a kidney stone develop another one later in their lives. Drinking plenty of water each day may prevent this from happening again.

For the few people who have a high level of certain chemicals in the body, further advice, and treatment to reduce the amount of these chemicals may be needed.

What to expect

Return to the emergency department if:

- you develop worsening symptoms or a fever
- your pain is severe, and you are not able to manage at home
- you are passing less urine than normal
- your urine is becoming very concentrated (much darker in colour).