

# Common questions and answers

## Why do I have a kidney stone?

Most of the time we cannot identify the reason why a patient forms kidney stones, but diet and fluid intake are extremely important. Below is a list of risk factors for forming stones:

- Abnormal hormonal problem e.g. hyperparathyroidism
- Certain medical/surgical conditions are associated e.g. diabetes, gout, inflammatory bowel disease/chronic diarrhoea, prior bowel surgery, gastric banding surgery
- Family history: kidney stones tend to run in families
- Age: stones are most common in the twenties to forties
- Sex: stones are 3 times more common in men
- Race: stones are less common in Afro-Americans and Aboriginal races
- Hereditary conditions
- Climate: risk increases in hot dry climates and in summer
- Occupation: risk increases in sedentary occupations, manual workers
- Recurrent urinary tract infections can predispose to stones
- Diet plays a big role
- Salt intake – very significant role. Usually hidden salts in processed foods
- Heavy meat intake
- Excessive nut, dairy intake
- Sugar intake – thought to play a significant role
- Supplement intake – calcium, vitamin-D

## What do kidney stones look like?

There are many different types of stone. Here is one!

## How do kidney stones form?

Kidney stones begin when tiny crystal particles in the urine clump together to form a stone. Over time these grow to form into larger stones.

### **What are the chances I will have another kidney stone episode?**

Unfortunately kidney stones have a very high rate of returning. Up to 50% of patients with a kidney stone will develop a new stone over 10 years.

### **How will I know if I have a formed a kidney stone?**

Mostly patients know they have a stone when they get pain, which can be quite severe. However kidney stones tend to only cause pain when they drop into the tube that comes out of the kidney (the ureter). Stones that are not blocking (non-obstructing stones) can grow from a very tiny stone to quite a large one without you ever noticing, and the only way to know these are present is by getting a scan (X-ray, ultrasound or CT scan).

### **Are all stone formers the same?**

No – each stone former is individual. When you are assessed in the clinic you are categorised into a low or high risk stone former. This is an assessment that tries to categorise your risk of forming a new stone over the course of your lifetime.

### **Who is low risk?**

You have a low risk of forming a new kidney stone if this is your first time stone episode, there are no other stones in the remaining kidneys, there is no family history of kidney stones and no medical/surgical reasons for stone formation.

If you are a low risk stone former, you will be screened for abnormal hormonal problems that cause kidney stones by getting a blood test. In addition, if you have had surgery your stone will be sent to the laboratory to be analysed.

If you have now If these results are all acceptable you will be discharged back to your GP with advice to drink over 2L of fluid per day (with a fresh lemon), reduce salt in your diet, eat a healthy well balanced diet and exercise.

### **Who is high risk?**

High risk stone formers are those deemed to be at high risk of forming a new stone over the short to intermediate term. High risk stone formers are those with:

- Bilateral stones (meaning both kidneys contain stones)
- Recurrent stone former (more than one stone episode)
- Family history of stones (one or more family members form stones)
- Surgical or medical reasons for stone formation
- Particular stone types (calcium phosphate stones)

If you are a high risk stone former we would discuss performing a 24-hour urine collection to assess for stone forming risk factors that could be targeted by either diet or medicines that prevent stones from forming. If commenced on a medicine this would be taken either daily or a few times per day. Many of these medications can have side effects, but are generally well tolerated.

## **What are the kidneys?**

The kidneys are two bean-shaped organs found under the ribs on either side of the upper abdomen. They filter toxins and excess water from the blood to produce urine, produce important hormones, regulate blood pressure and regulate the level of blood electrolytes.

Urine produced by the kidneys drains through thousands of tiny tubules into the renal pelvis. It then drains down to the bladder through a tube called the ureter.

The ureters drain urine into the bladder, which is then emptied via the urinary passage (the urethra). Pain usually disappears once kidney stones pass into the bladder. It is much easier, and usually painless, for stones to pass out through the urethra, because the urethra is about twice the diameter of the ureter.

## **What symptoms can I have?**

The most common complaint related to kidney stones is pain that can range from a dull ache to excruciating pain. The pain is usually located in the side of the body and may extend into the lower abdomen. The pain may reach down as far the groin or testicles. Typically the pain varies in intensity over time and can completely disappear and return later. The pain associated with a kidney stone tends to decrease over time.

Other symptoms of kidney stones can include:

- blood in the urine
- frequent urination and difficulty controlling the urge to urinate
- infection in the urine

## **Why do kidney stones cause pain?**

Stones can travel down the ureter to the bladder and out of the body through the urethra (the urinary passage). Along the way, stones can become stuck and cause blockage of the kidney and severe pain. As they move, they can also cause blood to appear in the urine. There are two narrow points in the ureters where stones can commonly become stuck: at the UPJ (near the kidney) and at the UVJ (near the bladder.)

## **What types of stone are there?**

There are numerous types of kidney stone depending on the composition of the substances that make up a stone.

The most common type of stone is made of calcium combined with oxalate, a substance found in numerous foods and drinks. Calcium may also combine with phosphate to form stones.

Uric acid is another fairly common kidney stone in urine. If deposited in joints, uric acid will cause gout. Patients with this type of stone may not have a history of gout, but all have high acidity in the urine.

Struvite stones are made of a combination of magnesium, ammonium and phosphate and are associated with urinary tract infections.

Cystine stones are an uncommon type of stone caused by a hereditary genetic disorder. These stones do not tend to fragment well with shockwave lithotripsy treatments.

Other rare types of stones make up the rest of the urinary stones encountered by patients.

### **Should I cut down on the amount of calcium in my diet?**

NO! Calcium is very important component of your diet, and binds to the oxalate present in many foods. If you cut your calcium down you will actually get more stones!! Eat calcium in moderation and as part of a well-balanced diet.

### **What if I take calcium supplements for osteoporosis or weak bones?**

The use of calcium supplements is linked in an increase in kidney stones. Firstly, we would look at whether you really need these supplements or not, what your stones risk is and what kind of stone you are making. If you really have to take these supplements then taking them with food can reduce the risk of stones. If you can it is better that get your calcium from dietary sources instead of calcium supplements.

### **How do you diagnose a kidney stone? What tests are there?**

If the initial assessment of a patient suggests the presence of a kidney stone, tests can be done to aid diagnosis.

#### **Urine**

The urine is examined for the presence of microscopic blood, which is present in most cases of kidney stone.

#### **X-ray**

Stones can usually be seen on X-rays (except uric acid stones).

#### **Ultrasound**

This test can show whether the kidney drainage appears to be blocked by a stone and may demonstrate the stone in the urinary tract.

#### **CT Scan**

CT scans which are specialized X-rays of the body are the best test to show the location, size and shape of stones in the urinary tract. The CT generally does not require any injection of contrast, and can be done quickly. The downside of CT however is the radiation exposure is higher than other tests.

#### **Retrograde Pyelogram**

If none of the above X-rays have shown important information about the ureters, an urologist may insert a telescope into the bladder and inject X-ray contrast up the ureter to see it better. This can be done under local or general anaesthesia, and may be done as part of the insertion of a stent.