KIDNEY STONES

KIDNEY HEALTH AUSTRALIA

WHAT ARE KIDNEY STONES?

The kidneys filter the blood and remove the extra waste and water as urine. Many waste chemicals are in the urine. They can sometimes form crystals that clump together to make stones.

Kidney stones are hard rock-like crystals of varying sizes and shapes. They can vary in size from as small as a grain of sand to as big as a golf ball.

ARE THERE DIFFERENT TYPES OF KIDNEY STONES?

There are four main types of stones:

1. Stones formed from calcium combined with oxalate or phosphate are the most common type Struvite stones, which are caused by a urine infection. These are often horn-shaped and quite large.
2. Uric acid stones are often softer than other forms of kidney stones.
3. Cystine stones, which are rare and hereditary. They look more like crystals than stones.

WHAT CAUSES KIDNEY STONES?

In most cases there is no known reason why a stone is formed. A kidney stone can form when substances such as calcium, oxalate, cystine or uric acid are at high levels in the urine. However, stones can also form if these chemicals are at normal levels.

Medications used for treating some medical conditions such as kidney disease, cancer or HIV can also increase your risk of developing kidney stones.

A small number of people get kidney stones because of a medical condition. These conditions can lead to high levels of calcium, oxalate, cystine or uric acid are at high levels in the body.

WHO IS AFFECTED BY KIDNEY STONES?

Kidney stones are one of the most common disorders of the urinary tract. About 4-8% of Australians suffer from kidney stones at some time. The lifetime risk of developing kidney stones is 1 in 10 for Australian men and 1 in 35 for women. The chance of developing a stone increases if you have a family history of stones and as you age. Urinary tract stones are more common in children in developing countries and amongst indigenous Australians.

After having one kidney stone, the chance of getting a second stone is about 5-10% each year. About 30-50% of people with a first kidney stone will get a second one within five years and then the risk declines. However, some people keep getting stones their whole lives.

WHAT PROBLEMS DO KIDNEY STONES CAUSE?

Kidney stones can cause a blockage in the flow of urine, which can damage and sometimes cause failure of the blocked kidney. Stones increase the chance of urinary and kidney infection and can result in the serious condition of septicaemia if germs spread into the blood stream.

WHAT ARE THE SYMPTOMS OF KIDNEY STONES?

Not all kidney stones cause discomfort but pain is usually the first sign. It usually begins when a stone moves from where it has formed into the urinary tract. This pain, known as 'renal colic', is a gripping pain in the back just below the ribs. It can spread around to the front of the body and sometimes towards the groin.

Other symptoms include:

- Blood in the urine, which can be seen by the eye or found when tested
- Nausea and vomiting
- Shivers, sweating and fever, cloudy or bad smelling urine if there is an accompanying infection
- 'Gravel' in the urine, which is made of small uric acid stones
- An urgent feeling of needing to urinate

HOW ARE KIDNEY STONES DETECTED?

Many stones are found by chance during tests for other conditions. Kidney stone tests may include:

- Ultrasound
- CT scans
- X rays including an intravenous pyelogram or IVP, where dye is injected into the bloodstream before the x-rays are taken.

Analysis of a stone is very useful so if you pass a stone, collect it and take it to your doctor. Detecting and diagnosing stones helps to decide on the treatment. Urine and blood tests can assist in finding out the cause of the stone.

HOW ARE KIDNEY STONES TREATED?

Most stones can be treated without surgery - 90% of stones will pass by themselves within 3 to 6 weeks. In this situation the only treatment required is pain relief. Pain can be so severe that hospital admission and very strong painkillers may be needed. However, if a stone doesn't pass and blocks urine flow or causes bleeding or an infection then it may need to be removed. New surgical techniques have reduced hospital stay time to as short as 48 hours.

Other treatments include:

- **Extracorporeal Shock-Wave Lithotripsy (ESWL):** Ultrasound waves are used to break the kidney stone into smaller pieces, which can pass out with the urine. It is used for stones less than 2cm in size.
- **Percutaneous Nephrolithotomy:** A small cut is made in your back then a special instrument is used to remove the kidney stone.
- **Endoscope Removal:** An instrument is inserted into the urethra, passed into the bladder then to where the stone is located. It allows the doctor to remove the stone or break it up so it can pass more easily.
- **Surgery:** If none of these methods are suitable, the stone may need to be removed using traditional surgery. This will require a cut in your back to access your kidney and ureter to remove the stone.

HOW CAN I PREVENT KIDNEY STONES OCCURRING AGAIN?

For most people with recurrent calcium stones a combination of better hydration (drinking enough fluids), avoiding urinary infections and specific treatment with drugs will significantly reduce or stop new stone formation.

Certain drugs such as thiazide diuretics or indapamide reduce the calcium excretion and decrease the chance of another calcium stone. Potassium citrate (Hydralyte, Pedialyte, Urocit-K) or citric juices are used to supplement thiazide treatment and by themselves for some conditions where there is a problem acidifying the urine.

For people who form stones and have a high level of uric acid in their urine or make uric acid stones, the drug allopurinol will usually stop the formation of new stones.

If you have had one stone already, these are some tips for reducing your risk of further stones:

- Talk to your doctor about the cause of previous stones.
- Ask your doctor to check what medications you are on to see if they might be causing your stones. Do not stop your medications without talking to your doctor.
- Get quick and proper treatment of urinary infections.
- Avoid dehydration. Drink enough fluids to keep your urine volume at or above two litres a day. This can halve your risk of getting a second stone by lowering stone-forming chemicals.
- Avoid too much tea or coffee. Citrus juices may reduce the risk of some stones, particularly orange, grapefruit and cranberry.
- Mineral water cannot cause kidney stones because it contains only trace elements of minerals.
- Reducing salt often lowers the risk of calcium containing stones. Don't add salt while cooking and leave the saltshaker off the table. Choose low or no salt processed foods.

- Lowering calcium below that of a normal diet is only necessary in some cases where absorption of calcium from the bowel is high. A low calcium diet has not been shown to be useful in preventing the recurrence of kidney stones and may worsen the problem of weak bones. People with calcium containing stones may be at greater risk of developing weak bones and osteoporosis. Discuss this risk with your doctor.
- Don't drink more than 1 litre per week of drinks with phosphoric acid, which is used to flavour carbonated drinks such as cola and beer.
- Always talk to you doctor before making changes to your diet.

For more information about kidney health or this topic, please contact Kidney Health Australia: Kidney Information Line (freecall) on 1800 4 543 639 or visit website www.kidney.org.au

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This is intended as a general introduction to this topic and is not meant to substitute for your doctor's or Health Professional's advice. All care is taken to ensure that the information is relevant to the reader and applicable to each state in Australia. It should be noted that Kidney Health Australia recognises that each person's experience is individual and that variations do occur in treatment and management due to personal circumstances, the health professional and the state one lives in. Should you require further information always consult your doctor or health professional.

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- TTY users phone 1800 555 677 then ask for 1800 454 363
- Speak and Listen users phone 1800 555 727 then ask for 1800 454 363
- Internet relay users - www.relayservice.com.au - "Make an internet relay call now" then ask for 1800 454 363