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KIDNEY STONES DISEASE, CAUSES, TREATMENT AND PREVENTION

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Annotation: *kidney stones are solid crystals formed from the salts in urine. They are sometimes called renal calculi. Kidney stones can block the flow of urine and cause infection, kidney damage or even kidney failure. They can vary in size and location.*

Key words: *calcium, struvite, uric acid, cysteine stones.*

INTRODUCTION

Kidney stones can block the flow of urine, which can then cause damage to your kidneys and sometimes kidney disease. Stones increase your chance of urinary and kidney infection and can result in germs spreading into your blood stream (septicaemia). The risk of kidney stones is about one in 10 for men and one in 35 for women. If you have had a kidney stone, you have an increased chance of getting a second stone. Thirty to fifty per cent of people with a first kidney stone will get a second stone within five years. After five years, the risk declines. However, some people keep getting stones their whole lives.

Types of kidney stones. There are four major types of kidney stones:

- Calcium - The most common stones are formed when calcium combines with other minerals like oxalate or phosphate
- Struvite - Struvite stones are caused by urinary tract infections (UTI's) and can be quite large
- Uric Acid - Uric acid stones are often caused by eating very large amounts of protein foods and are often softer than other types of stones. Eating a lot of fish, shellfish, and meat—especially organ meat—may increase uric acid in urine
- Cystine stones - Cystine stones are a rare inherited condition where the protein cysteine can build up in urine and form stones.

Causes of kidney stones:

A kidney stone can form when substances such as calcium, oxalate, cystine or uric acid are at high levels in the urine, although stones can form even 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 certain medical conditions that lead to high levels of calcium, oxalate, cystine or uric acid in the body.

Symptoms of kidney stones. Many people with kidney stones have no symptoms. However, some people do get symptoms, which may include:

- a gripping pain in the back (also known as 'renal colic') – usually just below the ribs on one side, radiating around to the front and sometimes towards the groin. The pain may be severe enough to cause nausea and vomiting
- blood in the urine
- cloudy or bad smelling urine
- shivers, sweating and fever – if the urine becomes infected
- small stones, like gravel, passing out in the urine, often caused by uric acid stones
- an urgent feeling of needing to urinate, due to a stone at the bladder outlet.

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 (IVP), where dye is injected into your bloodstream before the x-rays are taken

If a stone passes out of your body, collect it and take it to your doctor. This can help to decide on your
treatment. Urine and blood tests can also help to find the cause of your stone.

Treatment for kidney stones

Most kidney stones can be treated without surgery. Most stones will pass by themselves within three to six weeks. In this situation, the only treatment required is pain relief. However, pain can be so severe that hospital admission and very strong pain-relieving medication may be needed. Always seek immediate medical attention if you are suffering strong pain. Small stones in the kidney do not usually cause problems, so there is often no need to remove them. A doctor specialising in the treatment of kidney stones is the best person to advise you on treatment. 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 little as 48 hours.

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. ESWL is used for stones less than 2 cm in size
- percutaneous nephrolithotomy – for stones larger than 2cm. A small cut is made in your back, then a special instrument is used to remove the kidney stone
- endoscope removal – an instrument called an endoscope is inserted into the urethra, passed into the bladder and then to where the stone is located. It allows the doctor to remove the stone or break it up so you can pass it more easily
- surgery – if none of these methods is 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.

Complications of kidney stones

Kidney stones can range in size from a grain of sand to that of a pearl or even larger. They can be smooth or jagged, and are usually yellow or brown. A large stone may get stuck in the urinary system. This can block the flow of urine and may cause strong pain. Kidney stones can cause permanent kidney

damage. Stones also increase the risk of urinary and kidney infection, which can result in germs spreading into the bloodstream.

Avoiding recurrence of kidney stones

If you have had one kidney stone, some tips that may help to prevent a second stone forming include:

- Talk to your doctor about the cause of the previous stone.
- Ask your doctor to check whether the medications you are on could 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 the concentration of stone-forming chemicals in your urine.
- Avoid drinking too much tea or coffee. Juices may reduce the risk of some stones, particularly orange, grapefruit and cranberry. Eating or drinking grapefruit or cranberry juice can affect some medicines. Ask your doctor for advice as grapefruit juice and cranberry juice, in particular, can interact with medications.
- Reduce your salt intake to lower 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.
- Avoid drinking more than one litre per week of drinks that contain phosphoric acid, which is used to flavour carbonated drinks such as cola and beer.
- Always talk to your doctor before making changes to your diet.

Drinking mineral water is fine – it cannot cause kidney stones because it contains only trace elements of minerals.

The best way to prevent kidney stones is to make sure you drink plenty of water each day to avoid becoming dehydrated. To prevent stones returning, you should aim to drink up to 3 litres (5.2 pints) of fluid throughout the day, every day.

You're advised to:

- drink water, but drinks like tea and coffee also count
- add fresh lemon juice to your water
- avoid fizzy drinks
- do not eat too much salt

Conclusion, keeping your urine clear helps to stop waste products getting too concentrated and forming stones. You can tell how diluted your urine is by looking at its colour. The darker your urine is, the more concentrated it is. Your urine is usually a dark yellow colour in the morning because it contains a build-up of waste products that your body's produced overnight. Drinks like tea, coffee and fruit juice can count towards your fluid intake, but water is the healthiest option and is best for preventing kidney stones developing. You should also make sure you drink more when it's hot or when you're exercising to replace fluids lost through sweating.

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