

# *Kidneys & Kidney Failure*

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## *Kidney Stones & Kidney Failure*

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This booklet will help you to know in brief about kidneys and their functions, kidney stone, symptoms, causes & prevention of kidney stone, how kidney stones cause kidney failure, the kind of treatments available to remove kidney stone.

The kidneys are paired, bean-shaped organs, located in the back side of the stomach, on either side of the vertebral column. Each kidney is capable of sustaining life independently. In other words, a person can lead a normal life even with one kidney.

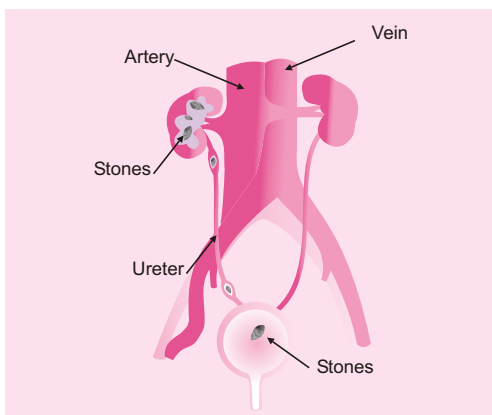
Kidneys are the chief excretory organs of body . The main function of the kidney is to excrete waste products. Apart from excretion, kidneys perform other important functions also which are balancing the body fluid, producing a hormone called Erythropoietin, controlling blood pressure and keeping bones healthy.

## **What is Kidney Stone ?**

A kidney stone is a particle crystal or solid lump in the urinary tract formed by substances in the urine. The medical term for kidney stones is nephrolithiasis, urolithiasis, or renal calculi, which means that abnormal, hard, chemical deposits have formed inside the kidneys, ureters or urinary bladder. Certain conditions and chemical imbalances contribute to the creation of stones. Men get stones more compared to women. Approximately 75% kidney stones are Calcium Oxalate stones formed predominantly from Calcium Oxalate or a combination of Calcium Oxalate & Calcium Phosphate.

Approximately 10 -12 % are formed of uric acid. Uric acid stones are believed to be due to acidic urine . Struvite (Magnesium Ammonium Phosphate) stones are associated with infection with urea-splitting bacteria.

Cystine stones are rare. Cystine is one of the building blocks that make up muscles, nerves, and other parts of the body. Cystine can build up in the urine to form a stone. The disease that causes cystine stones is hereditary.



## Symptoms of Kidney Stone

1. A sudden pain in the night or early in the morning.
2. Pain from the upper back to the lower abdomen and groin
3. Nausea and vomiting
4. Absence of urination
5. Frequent urination
6. Pus or blood in the urine
7. Difficulty in sitting & lying down
8. Chills and fever

## What causes a Kidney Stone ?

Kidney stones may form for a number of reasons:

1. High levels of calcium, cholesterol, uric acid, or other salts in the blood, which don't pass out of the body normally
2. Drinking hard water
3. Chronic dehydration
4. Some conditions that cause a reduction in urine flow
5. Local infection
6. A genetic predisposition

## How does Kidney Stone cause Kidney Failure?

The kidneys, along with the bladder, ureters, and urethra make up the urinary tract. In both men and women a healthy urinary tract is vital for maintaining overall well being.

Kidney stone causes obstruction to the flow of urine. Obstruction leads to back flow of urine into the kidney which causes damage to the internal kidney structures, also known as obstructive nephropathy.

Alternatively, there can be a stone in the kidney itself which can damage the cells of the kidney and thus fail the kidney.

## Treatments for Kidney Stone

### i) Extracorporeal shock wave lithotripsy

It is one of the most important technological advances in kidney stone treatment. A machine called a lithotripter is used to generate a shock wave outside the body. The shock wave is focused on the kidney stone, to break a large stone into small stones which can easily pass through urinary system along with urine. This method does not require surgery.

### ii) Ureteroscopy

This method is used for stones in the lower ureters. A small telescope is inserted into the urethra and is passed through the bladder and finally to the ureters where the stone is located. The stone is removed using a small basket or is broken up using a very small shock wave probe. Following the procedure, a small silicone tube is left inside the ureters for 5-7 days to help relieve swelling.

### iii) Percutaneous Nephrolithotomy

If a kidney stone is larger than 3 centimeters (over 1 inch), a Percutaneous Nephrolithotomy is often used for treatment. Instruments are passed through a small tract passing through the side of a patient into the kidney to break up the kidney stone.

#### **iv) Electrohydraulic lithotripter**

This procedure uses shockwaves produced by a small internal probe to break up kidney stones. It is commonly used for small kidney stones.

#### **v) Open stone surgery**

A cut is made into the patient's back which makes a hollow tube like structure through skin to the stone inside the kidney. The stone is then removed.

#### **vi) Watchful waiting**

Small kidney stones may not cause any pain & they will pass out on their own. Larger stones get stuck in narrow parts of the kidney and ureters, which causes intense pain.

Drinking lots of water and taking bumpy rides can be useful to remove small stones. An x-ray 1-2 weeks after diagnosis helps track how the stone is progressing.

### **Some healthy suggestions to prevent stones**

1. Drink at least two liters of water per day, free from fluoride and chemical additives.
2. Avoid consumption of caffeine and soft drinks. It makes the urine more saturated and more likely to form stones.
3. Decrease consumption of refined sugars.
4. Increase the amount of dietary fiber in food.
5. Decrease amount of foods which contain high levels of oxalate, such as spinach, rhubarb, parsley, tea and cocoa.

## Points to Remember

1. Some stones pass out of the body spontaneously.
2. One should visit a doctor if there is severe pain in back or side that does not go away.
3. One should visit doctor if one finds blood in urine.
4. Whenever stone passes out into urine preserve it to be shown to a doctor.
5. Talk to doctor about how to avoid more stones.

## Key words:

Kidney stone, Extracorporeal shock wave Lithotripsy, Ureteroscopy, Percutaneous Nephrolithotomy, Electrohydraulic lithotripter, Open stone surgery

Please also refer the following information booklets from India Renal Foundation for more information.

1. Choosing Your Treatment
2. Haemodialysis
3. Peritoneal Dialysis
4. Kidney Transplantation
5. Diabetes and Kidney Failure
6. Hypertension and Kidney Failure
7. Kidney Failure and Anemia

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