KIDNEY STONES

OVERVIEW

Kidney stones are mineral and salt deposits that form within the kidneys. They are also commonly referred to as renal calculi and the conditions nephrolithiasis or urolithiasis. Many factors contribute to the formation of kidney stones, including diet, body weight, certain pre-existing medical conditions, and side effects of some medications.

These stones can adversely affect any part of the urinary tract. When urine becomes concentrated in the kidneys, minerals therein have the chance to crystallize. When these stones pass through the urinary tract, they can cause severe pain. In most cases, there is no injury or other severe damage.

In some cases, the only required course of action is to increase fluid consumption to aid passing. However, the stones can become stuck in the urinary tract, which will lead to further complications. Kidney stones can be a recurring condition in some patients, and preventative measures are typically prescribed for these individuals.

SYMPTOMS

Kidney stones typically only manifest symptoms once they begin to pass through the urinary tract. Observable symptoms include:

- Severe pain below the ribs in the side or back
- Pain while urinating
- Pink or red urine
- Frequent urination
- Nausea/Vomiting

The pain that accompanies kidney stones can change location as the stones travel along the urinary tract.

DIAGNOSIS

The most effective method for diagnosing kidney stones is imaging testing. The dense mineral deposits appear readily through a variety of imaging methods, including dual-energy computerized tomography. These methods can detect even tiny stones.

A urine test can reveal the extent of stone-forming minerals in the urine, indicating the concentrations in the kidneys. Too much can mean significant concentrations in the kidneys, while too little can show that stones crystallize and retain minerals in the kidneys.

Patients may be asked to urinate using a filter that will capture their kidney stones. Analysis of the stones will allow a physician to determine the cause of the kidney stones and formulate a treatment or prevention plan.

TREATMENT

The treatments used for kidney stones vary widely based on the severity and frequency of the stones, along with their cause. The majority of kidney stones do not call for any invasive treatment.

TREATMENT FOR SMALL KIDNEY STONES

In many cases, a physician will prescribe that the patient drink significant quantities of water, up to a gallon per day. That will keep the concentration of minerals in urine low, reducing the risk of crystallization.

In cases where pain is present, over-the-counter pain relievers can be used for relief. Doctors can also prescribe medications to ease the passing of kidney stones, notably alpha-blockers that relax the muscles within the urinary tract.

TREATMENT FOR LARGE KIDNEY STONES

When kidney stones are too large to pass, they may cause kidney damage, bleeding, and urinary tract infections. Depending on the location of the stone, your doctor may recommend a variety of procedures. For stones in the kidney, shock wave lithotripsy, ureteroscopy and laser lithotripsy, or percutaneous nephrolithotomy are all options depending on size and location of the stone, patient anatomy, and a variety of other factors including medications, body habits, and stone density. For ureteral stones that appear too large to pass, ureteroscopy is often the favored method of treatment.

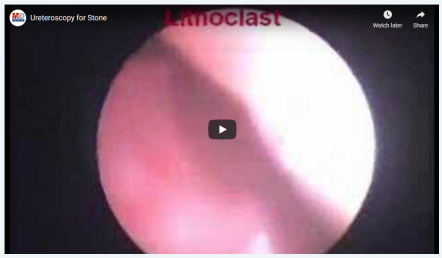
Ureteroscopy

Ureteroscopy is a minimally invasive procedure where your urologist passes a scope through your bladder and into your ureter (the tube that runs from the kidney to the bladder). It is most commonly performed for stone disease, but can also be used to treat or diagnose tumors of the ureter or kidney, or to evaluate the ureter for obstruction. Other instruments can be passed through the ureteroscope such as a laser fiber or a basket in order to complete your procedure. Often a stent (a soft, hollow tube) is left within the ureter for several days to allow healing.

WHAT TO EXPECT AFTERWARDS:

Utereroscopy is generally performed under general anesthetic as an outpatient. Afterwards you may have minor abdominal and flank discomfort as well as frequent and sometimes painful urination. Narcotic pain medication is usually prescribed as well as bladder relaxant pills. Blood in the urine is common for several days and may occur intermittently while the stent is in. You can resume normal activity 24-48 hours after surgery, although you should refrain from heavy lifting if you have a lot of blood in the urine or pain with urinating. You should not drive while taking narcotic pain medication. The stent will be removed, typically in the office, when appropriate.

FOR AN EXAMPLE OF URETEROSCOPY, SEE THE FOLLOWING YOUTUBE VIDEO:



PCNL

PERCUTANEOUS NEPHROSTOLITHOTOMY (PCNL)

Percutaneous Nephrostolithotomy is a procedure performed to remove large stones in the kidney or ureter. There are two parts to the operation. The first involves looking in your bladder with a scope and placing a small catheter into your kidney. This allows your urologist to find the correct spot in which to access the kidney in order to remove your stones. The second part involves placing a small tube directly into the kidney through the flank. A combination ultrasound and suction device is used to remove the stones. A flexible scope is used in some cases to look at all the areas of your kidney and remove any remaining stones. At times, additional accesses into the kidney may be required to remove all of the stones. At the end of the procedure a small drainage tube is placed into the kidney. It generally remains for 2-7 days at the discretion of your urologist. You may be sent home with the tube in your kidney, but will be instructed on care of it prior to your discharged. You will have a catheter in the bladder the first night. A one night hospital stay is generally required. X-rays are checked after surgery to evaluate if all of the stones were removed. You will be able to eat and drink afterwards and discomfort is generally mild.

WHAT TO EXPECT AFTERWARDS:

Blood in both the kidney tube and your urine is normal for a few days to a few weeks. After the kidney tube is removed, it is common to have flank drainage for 2-5 days. If it lasts longer call your doctor. Pain is generally mild but you will have both IV and oral pain medications available.

CALL YOUR DOCTOR IF:

- Temperature >101° F.
- Inability to void.
- You are passing clots in your urine.
- Flank drainage for more than five days after the kidney tube is removed.

ESWL COMING SOON!

What Treatments Can Reduce Chronic Kidney Stones?

The overactivity of the parathyroid glands can cause chronic kidney stones. Benign tumors could result from overactivity, too. A parathyroid gland surgery can reduce hyperparathyroidism that leads to increased calcium levels. With calcium levels restored to normal, kidney stones are less likely to form in the future.

What Lifestyle Changes Can Reduce the Risk of Kidney Stones?

The most significant factor that can reduce the risk of kidney stones is increased consumption of fluids throughout the day. That prevents the concentrated urine that is most likely to produce stones. Those concerned about kidney stones can reduce their consumption of oxalate-rich foods like spinach, okra, chocolate, and soy products. Reducing salt and animal

Can Medication Manage Kidney Stones?

There are specific medications for patients who have regular kidney stones. These medications prevent the formation of kidney stones of particular minerals, so the type of kidney stones must be determined first. These include calcium, uric acid, struvite, and cystine kidney stones. A physician can evaluate the type of stone and prescribe the appropriate medication.

What Are the Risk Factors for Developing Kidney Stones?

Obesity is one factor linked to an increased risk of kidney stones. Frequent dehydration is another significant risk factor for anyone in dry climates. Diets high in salt and protein can lead to kidney stones, with salt interfering with the way kidneys handle calcium.