



# Understanding Kidney Stones



## What are kidney stones and why do I form them?

Kidney stones are made of minerals and salts, normally found in the urine that, when present in high concentration, congeal, creating hard deposits and stone. A kidney stone can form when substances such as calcium, oxalate, cysteine or uric acid are at high concentrations in the urine. Most kidney stones form when someone's urine becomes concentrated, allowing these minerals in your urine to crystalize and stick together, forming a stone. The size of kidney stones varies from as small as a grain of rice to that of a pearl or larger.

## Who forms kidney stones?

Kidney stones are a common problem. 11% of men and 7% of women will have at least one symptomatic stone by the age of 70. There are four major types of kidney stones:

- 1. Calcium stones (oxalate):** This is the most common type of kidney stone and is made up of calcium oxalate or calcium phosphate. Calcium oxalate is a naturally occurring substance in foods such as fruits, vegetables, nuts and chocolate. Your liver also produces calcium oxalate. If you have a calcium stone that is made up of calcium phosphate, you may also have a metabolic condition like renal tubular acidosis, suffer from migraine headaches or may be taking seizure medication.
- 2. Cystine stones:** In these cases, your kidneys expel too much cysteine, which is an amino acid. It is a genetic deficiency of the enzyme required for proper processing of cysteine.
- 3. Struvite stones:** These kidney stones can become some of the largest and form quickly with few symptoms. These stones occur after you have had an infection like a urinary tract infection.
- 4. Uric Acid stone:** These stones are typically due to dietary issues. Those who are dehydrated, maintain a high-protein diet, or have gout are more prone to this type of stone.

## What causes kidney stones?

There is no one cause for contracting kidney stones but there are several factors that have been known to cause kidney stones.

- **Genetics:** You are at an increased risk of contracting kidney stones if you have previously had one or more kidney stones or if someone in your immediate family has suffered from kidney stones.
- **Not drinking enough water:** Dehydration can contribute to contracting kidney stones, especially for those who sweat more than average or who live in more tropical climates.
- **Diet:** People who consume significant amounts of sodium are at an increased risk of getting kidney stones because your kidneys have to filter a greater amount of calcium out of your body. High protein and high sugar diets have also been found to increase your risk of getting kidney stones.
- **Medications:** Some medications predispose patients to kidney stones as well.
- **Certain digestive disease or surgery:** Various conditions that slow your body's ability to absorb calcium and water may cause kidney stones. Examples include gastric bypass surgery or inflammatory bowel disease.
- **Medical conditions:** Renal tubular acidosis, cystinuria or hyperparathyroidism may contribute to kidney stones. Additionally, some medications and urinary tract infections have been known to cause kidney stones.



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## What are the symptoms of kidney stones?

Symptoms are typically not experienced until the stone(s) begin to move around in the kidney or moves into the urinary tract. Once this happens, it is often quite painful. If you are experiencing the following symptoms, you may have kidney stone(s):

- stabbing pain below the ribs near your side or on your back
- radiating pain in the lower abdomen and groin area
- pain that fluctuates in intensity or comes and goes
- pain when trying to urinate
- discoloration or blood in the urine
- urine that has a strong odor or is cloudy
- nausea or vomiting
- constant feeling of pressure or need to urinate

## How do you get rid of kidney stones?

Most of the time, you will naturally pass the stone and there will be no permanent damage to the kidneys or your urinary tract. This is a painful process for many but does not require much medical intervention other than taking medication to manage the pain. In the cases of larger stones, which may result in infection or urinary obstruction, special procedures to break or remove the stones can be performed by a Urologist.

## How can I prevent kidney stone formation?

Drinking more liquids/water helps decrease the risk of stone formation. It is recommended that you drink as much liquids/water as possible to help in the process of passing the kidney stones. A good rule of thumb to follow is to drink approximately 2-3 liters (8-10 glasses) of water or other liquids daily to the point that your urine is pale straw in color when you urinate. Additionally, you may be started on a special diet, which will be provided to you.

## How can my Nephrologist help?

Most medical attention (if required) for kidney stones is completed by a Urologist. Your Nephrologist can help you determine if you are suffering from kidney stones and will provide you with some initial means of passing the stone(s). They will also work collaboratively with the Urologist and refer you as indicated, should you require further attention.

### Sources:

<http://www.mayoclinic.org/diseases-conditions/kidney-stones/symptoms-causes/dxc-20319562>

<http://www.kidneyfund.org/kidney-disease/kidney-problems/kidney-stones/types-of-kidney-stones.html?referrer=https://www.google.com/>

[http://www.europeanurology.com/article/S0302-2838\(12\)00404-6/fulltext](http://www.europeanurology.com/article/S0302-2838(12)00404-6/fulltext)

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