

# SEPSIS AND KIDNEY STONES

Your kidneys are the beginning of your urinary system. Urine is filtered in your kidneys that then flows down into your bladder through a ureter. Each kidney has one ureter that goes to the bladder. The urine is held in your urinary bladder until you empty it, when your urine passes through the urethra and out the urethral opening. Urine has no solids, but there are times when crystals in urine join together to form a stone or multiple stones. Although there are several substances that can form stones, the four most common kidney stones are made of:

- Calcium- common and can recur
- Cystine- an amino acid
- Struvite- develop as a result of urinary tract infections (UTIs)
- Uric acid- a crystalline compound

Kidney stones may block the flow of urine and cause a kidney infection, which can lead to sepsis. Sometimes incorrectly called blood poisoning, sepsis is the body's often deadly response to infection. Sepsis kills and disables millions and requires early suspicion and rapid treatment for survival.

Sepsis and septic shock can result from an infection anywhere in the body, such as pneumonia and urinary tract infections, and viral infections like the flu, as well as from seemingly innocent injuries, like infected bug bites or scratches. Worldwide, one-third of people who develop sepsis die. Many who do survive are left with life-changing effects, such as post-traumatic stress disorder (PTSD), chronic pain and fatigue, organ dysfunction (organs don't work properly), and/or amputations.

## ORIGINS

While we don't know what causes stones to form, we do know some stones form more easily than others. Dehydration, not consuming enough fluids, can contribute to stone formation, as there may not be enough urine to wash out the microscopic crystals.

**Calcium stones**, are the most common type of kidney stones. Risks include:

- Too much calcium in the urine caused by disease, such as hyperparathyroidism
- Having too much sodium, usually taken in through salt

Although food doesn't cause the stone formation, some people may be told to avoid high calcium foods if they are prone to developing stones.

**Cystine stones** are caused by a disorder that runs in families.

**Struvite stones** are virtually always caused by a urinary tract infection (UTI), as a result of an enzyme secreted by certain types of bacteria. Because people with shorter urethras have more UTIs, they also tend to develop more struvite stones. These stones can grow very large and can block the kidney, ureter, or bladder.

**Uric acid stones** can also occur in people who already get calcium stones. People who have high uric acid levels may have or develop gout.

## SYMPTOMS

Some people don't feel kidney stones until they start to move. Some symptoms include:

- Sharp, severe, cramping pain in the abdomen or side of the back
- Pain can move to the groin or testicular area
- Blood in the urine
- Chills or fever
- Nausea or vomiting

## KIDNEY INFECTIONS

It is possible to have a kidney stone and to not know it. Some people see their doctor or nurse practitioner because they think they may have a kidney infection, for example. The symptoms of a kidney infection can include many of the same as the stone plus:

- Urgent and/or frequent need to urinate
- Burning, painful feeling when urinating
- Cloudy urine
- Foul-smelling urine

## TREATMENT

If you have a kidney stone, you will likely be encouraged to drink a lot of water if you don't have a medical condition that limits the amount you may have. Extra fluid helps wash the stone through your urinary system.

If the stone doesn't pass within a reasonable amount of time, your doctor may recommend extracorporeal shock wave lithotripsy (ESWL). Shock waves are sent through to the stone to break them down into smaller pieces that can be passed. Sometimes, surgery may be needed.

The stone should be removed because of the high risk of infection, which could – in turn – lead to sepsis.

## WHAT IS SEPSIS?

Sepsis is the body's overwhelming and life-threatening response to infection, which can lead to tissue damage, organ failure, and death.

### What are the signs and symptoms of sepsis?

Sepsis is a toxic response to an infection. There is no single sign or symptom of sepsis. It is, rather, a combination of symptoms.

Symptoms can include ANY of the following:

<b>T</b>	<b>Temperature:</b> Higher or lower than normal
<b>I</b>	<b>Infection:</b> May have signs and symptoms of an infection
<b>M</b>	<b>Mental Decline:</b> Confused, sleepy, difficult to rouse
<b>E</b>	<b>Extremely Ill:</b> Severe pain, discomfort, shortness of breath

**SEPSIS IS A MEDICAL EMERGENCY. IF YOU SUSPECT SEPSIS, CALL 9-1-1 OR GO TO A HOSPITAL RIGHT AWAY.**

**To learn more about sepsis, or to read tributes and survivor stories, visit us online at [Sepsis.org](https://www.sepsis.org)**



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