Your kidneys are the beginning or the first part of your urinary system. Your urine is filtered in your kidneys and the urine then flows down into your bladder through a ureter, one from each kidney. 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 stones formation, as there may not be enough urine to wash out the microscopic crystals.

**Calcium stones**, the most common kidney stones, affect more men than women. 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 and affects both men and women.

**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 more women than men have UTIs, more women than men develop struvite stones. These stones can grow very large and can block the kidney, ureter, or bladder.
Uric acid stones affect more men than women and they 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. Sepsis is the body’s overwhelming and life-threatening response to infection, which can lead to tissue damage, organ failure, and death. If your doctor determines that you have an infection, you may be prescribed antibiotics, which are often used to treat sepsis.

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:

- S – Shivering, fever, or very cold
- E – Extreme pain or general discomfort (“worst ever”)
- P – Pale or discolored skin
- S – Sleepy, difficult to rouse, confused
- I – “I feel like I might die”
- S – Short of breath

What should I do if I think a loved one or I have sepsis?

Don’t wait another minute. If you suspect sepsis, see a doctor, go to a hospital, or call 9-1-1 and tell them, “I AM CONCERNED ABOUT SEPSIS.”

To learn more about sepsis, or to read tributes and survivor stories, visit us online at Sepsis.org