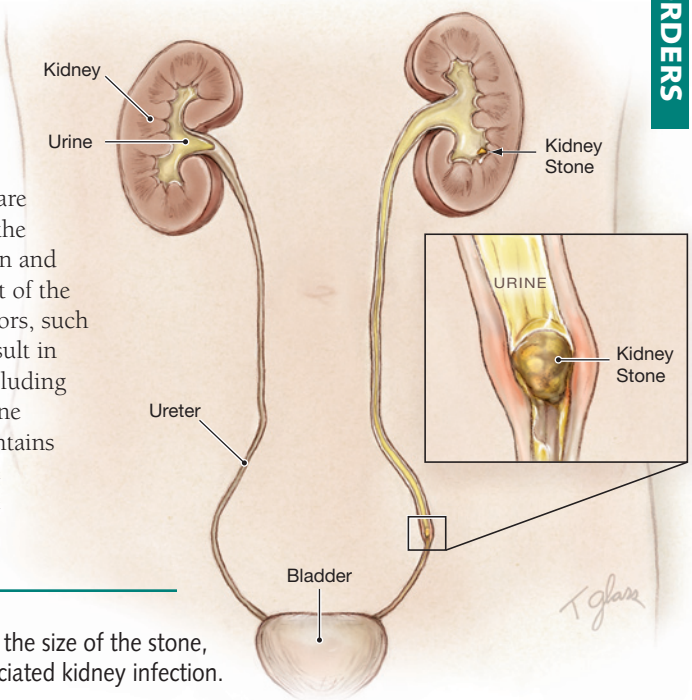
Kidney Stones

Kidney stones result from the **precipitation** (crystallization of previously dissolved particles) of certain substances within the urine. These stones form in the kidney and subsequently travel through the **ureter** (the tube that conducts urine from the kidney to the bladder) and are eliminated through the urine if they are small. In some cases, the stone may not be able to travel through the ureter, causing pain and possibly causing an obstruction, blocking the flow of urine out of the kidney. Kidney stones can be caused by a large number of factors, such as infection, certain diets, medications, and conditions that result in an increased concentration of calcium or other substances, including oxalate and uric acid, in the urine. The composition of the stone depends on the cause, but the most common type of stone contains calcium. The March 2, 2005, issue of *JAMA* includes an article that reviews the causes and diagnosis of kidney stones and the available treatments.



SYMPTOMS

The symptoms associated with kidney stones vary depending on the size of the stone, its position within the urinary tract, and whether there is an associated kidney infection.

- Pain in the back or side
- Blood in the urine
- Vomiting
- Fever
- Urinary frequency or **urgency** (the sensation of the immediate need to urinate)
- Pain with urination

DIAGNOSIS

In addition to a complete medical history and physical examination, your doctor may order blood tests to assess your kidney function and the concentration of certain **electrolytes** and dissolved minerals (such as calcium) in your blood. A **urinalysis** (analysis of a small sample of urine for infection and blood) and a 24-hour urine collection (to look for substances associated with kidney stones) may also be performed. Your doctor may order a computed tomography (CT) scan, abdominal x-ray, or ultrasound test to locate the stone and to rule out other possible causes of the symptoms.

TREATMENT

- Initial treatment includes pain medication and oral or intravenous fluid to help the stone pass through the urine.
- **Extracorporeal shock wave lithotripsy** is a procedure that uses shock waves to break up the stone without the need for surgery.
- Surgery may be necessary if the stone is very large and if there is blockage of the affected kidney or infection.
- Depending on the cause of your kidney stone, your doctor may prescribe medication or suggest dietary changes to prevent a recurrence.

FOR MORE INFORMATION

- National Institute of Diabetes and Digestive and Kidney Diseases
  800/891-5390
  www.niddk.nih.gov
- National Kidney Foundation
  800/622-9010
  www.kidney.org
- American Kidney Fund
  800/638-8299
  www.akfinc.org

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Sources: National Institute of Diabetes and Digestive and Kidney Diseases; National Kidney Foundation

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