

# Managing Stone Disease

## An Often Challenging Proposition

By C. Ritchie Spence, MD



The first reference to kidney stones was made by Hippocrates in the Hippocratic Oath: *I will not cut persons labouring under the stone, but will leave this to be done by men who are practitioners of this work.* Kidney stones have even affected the outcome of a major war. Charles Louis Napoleon, nephew of Napoleon Bonaparte, lost the Franco-Prussian War of 1870 due wholly or in part to impaired kidney function resulting from kidney stone formation. Though the condition is still painful, progress is being made toward new treatments.

### Epidemiology

Kidney stones form when the urine becomes too concentrated as a result of dehydration, a urinary tract infection, and/or diet. Most stones contain calcium combined with oxalate, phosphate, or, occasionally, uric acid. While genetically inherited disorders account for some stone formation, high protein and salt intake, excessive vitamin C consumption, and calcium supplements increase the risk. Foods high in purines, such as red meat, fish and chicken, are also factors.

Approximately 10% of men and 5% of women will have at least one kidney stone by age 70, with the majority occurring between the ages of 20 and 40 years. The frequency of kidney stones in westernized nations is rising. Once you have had one, your chances of having a recurrence are approximately 50% within five to 10 years. Caucasians are more prone to stone formation than African Americans or Hispanics. There is even a geographic area running from northern Alabama to North Carolina known as the “stone belt,” where the frequency seems unusually high.

### Diagnosis

The most frequent symptom of a kidney stone is extreme pain that often begins suddenly as a sharp, cramping ache in the back near the kidney area or in the lower abdomen and then spreads to the groin. Often, there is also blood in the

urine, nausea, and/or vomiting. When stones are associated with a urinary tract infection, fever is common.

There are a number of ways to diagnose kidney stones, beginning with a routine urinalysis to determine the components of the urine. Urine cultures are performed to rule out infection. The most common test to diagnose kidney stones is an x-ray of the kidney, ureter, and bladder; it also determines the size and location of the stone. A major diagnostic advancement is the use of spiral computed tomography (CT) scans, which are particularly useful for patients who are allergic to the dye used during the traditional IVP (intravenous pyelogram) procedure.

## Treatment

Because approximately 80% of all stones pass spontaneously, the wait-and-see approach is the recommended option for small stones and patients who have stabilized pain. Patients are encouraged to drink lots of water and, if necessary, take prescription pain medication and



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warm baths to relieve the pain. Flomax®, a medication used to treat enlarged prostates, is also regularly prescribed to ease stone passage in men and women.

The most revolutionary advancement in kidney stone treatment is lithotripsy, a technique that uses shock waves to break the stone into pieces as small as a grain of sand that are then passed from the

body with urine. After the stones are precisely located using x-rays or ultrasound, the patient lies on a soft water-filled cushion while shock waves are passed through the body. (Early lithotripsy technology required the patient to stand suspended in a large tub of water.)

The procedure is usually performed on an outpatient basis and takes approximately one hour. Anesthesia is used to help the patient remain still and avoid discomfort. Lithotripsy is most appropriate for stones 6 mm to 20 mm in size.

When the stones are too large for lithotripsy, surgery is often necessary. A preferred option is percutaneous nephrostomy lithotomy. A small incision is made in the back, and flexible wires are inserted into the kidney. Then dilating balloon catheters and plastic tubes are advanced over the wires into the kidney to facilitate destruction of the stone(s) and removal of fragments.

## Follow-Up

After its removal, the stone is analyzed to determine its chemical composition, which gives insight into its causes and may offer possible preventative measures. Drinking plenty of water and diminishing salt in the diet are good generic treatments. Medications such as diuretics, allopurinol (for uric acid stones), and alkalinizing agents are often given to decrease stone formation and aid in the breakdown of the stone-forming materials. ☞

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