You have come to the emergency department and the emergency doctor has recommended an imaging test to check for kidney stones. This summary will tell you about two types of imaging tests—a CT scan (computed tomography scan) and an ultrasound.

Kidney Stones and Possible Symptoms

The kidneys are bean-shaped organs that filter the waste chemicals out of your blood and make urine. A kidney stone is a hard piece of material that forms inside your kidney when tiny mineral crystals in your urine stick together.

Kidney stones can range in size and shape. They can be as small as a grain of sand or as large as a golf ball. But, big stones are rare.

Symptoms of kidney stones may include:
» Sharp pain in your back, side, lower belly (below your belly button), or groin that may come and go
» Nausea and vomiting
» Blood in your urine
» The feeling of sand or small particles passing through when you urinate
» Pain when you urinate
» Feeling like you need to urinate but cannot

Checking for Kidney Stones in the Emergency Department

First, the emergency doctor will give you medicine to help stop your pain. The medicine may be given by mouth. Or, it may be given through an intravenous (IV) needle placed in a vein in your arm. You may also be given medicine to help stop your nausea and vomiting. If you are dehydrated from vomiting, you may be given liquids through an IV tube.

Next, the emergency doctor will talk with you about your symptoms and medical history. If the emergency doctor thinks you might have a kidney stone, several tests may be done. These may include:

URINE TESTS: To check for blood or mineral crystals in your urine or for signs of infection.

BLOOD TESTS: To check the health of your kidneys and for signs of a kidney or blood infection.

IMAGING TESTS: To check for kidney stones in your urinary tract (kidneys, ureters, and bladder). Imaging tests may include a CT scan or an ultrasound.

Talking with the Emergency Doctor about Your Options for Imaging Tests

Talk with the emergency doctor about whether it might be better to have an ultrasound or a CT scan first to check for kidney stones.

You may want to think about:
How you feel about being exposed to radiation with a CT scan.
How you feel about possibly needing a second imaging test.
What Researchers Found

» Both CT and ultrasound find most kidney stones.

» Whether you have an ultrasound or a CT scan first:
  - Does not affect the amount of pain you have or how quickly your pain will go away.
  - Does not change the risk of having serious side effects or complications from kidney stones.
  - Does not change the risk of having to go back to the emergency department or stay in the hospital.

» Having an ultrasound first may help you avoid being exposed to radiation from a CT scan.
  - If you have an ultrasound first, you may need a second imaging test, which may be a CT scan. But, most people who have an ultrasound first do not need a CT scan.

Note: If you and the emergency doctor decide on a CT scan, ask if it is possible to get a low-dose CT scan. Low-dose CT works as well as normal-dose CT to check for kidney stones and exposes you to less radiation.

The Source of This Information

The information in this summary comes from the research article, “Ultrasonography Versus Computed Tomography for Suspected Nephrolithiasis,” published in The New England Journal of Medicine, September 18, 2014. The research was done by Rebecca Smith-Bindman and her colleagues through funding by the Agency for Healthcare Research and Quality. For more information, go to www.effectivehealthcare.ahrq.gov/kidney-stones-tests. Additional information came from:


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