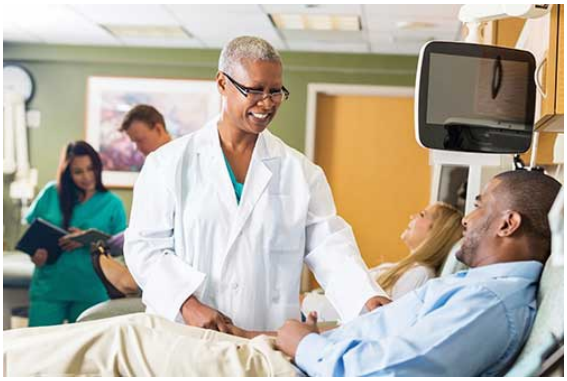
Ureteral Stenting and Nephrostomy



Ureteral stenting and nephrostomy help restore urine flow through blocked ureters and return the kidney to normal function. Ureters are long, narrow tubes that carry urine from the kidneys to the bladder. They can become obstructed – and urine flow blocked – as a result of various conditions. Your doctor may use image guidance to place a thin, flexible tube called a stent into the ureter to restore urine flow. If a stent cannot be placed, he may perform a nephrostomy, during which a tube is placed through the skin into the kidney and connected to either an external drainage bag or the bladder for internal drainage.

Tell your doctor if there is a possibility you are pregnant and discuss any recent illnesses, medical conditions, allergies and medications you're taking. Your doctor may advise you to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) or blood thinners several days prior to your procedure and instruct you not to eat or drink anything after midnight the night before. Take regular medication with sips of water. Leave jewelry at home and wear loose, comfortable clothing. You may be asked to wear a gown. If you are not to be admitted to the hospital, plan to have someone drive you home afterward.

What are Ureteral Stenting and Nephrostomy?

Urine is normally carried from the kidneys to the bladder through long, narrow tubes called ureters (http://www.radiologyinfo.org) . The ureter can become obstructed due to conditions such as kidney stones, tumors, infection, or blood clots. When this happens, physicians can use image guidance to place stents or tubes in the ureter to restore the flow of urine to the bladder.

A ureteral stent is a thin, flexible tube threaded into the ureter. When it is not possible to insert a ureteral stent, a nephrostomy is performed. During this procedure, a tube is placed through the skin on the patient's back into the kidney. The tube is connected to an external drainage bag or from the kidney to the bladder for internal drainage.

How should I prepare?

Tell your doctor about all the medications you take, including herbal supplements. List any allergies, especially to local anesthetic (http://www.radiologyinfo.org) , general anesthesia (http://www.radiologyinfo.org) , or contrast materials (http://www.radiologyinfo.org) . Your doctor may tell you to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs (http://www.radiologyinfo.org)) or blood thinners before your procedure.

Women should always tell their doctor and radiologic technologist (http://www.radiologyinfo.org) if they are pregnant. Doctors will not perform many tests during pregnancy to avoid exposing the fetus (http://www.radiologyinfo.org) to radiation. If an x-ray is necessary, the doctor will take precautions to minimize radiation exposure to the baby. *See the Radiation Safety (https://www.radiologyinfo.org/en/info/safety-radiation) page for more information about pregnancy and x-rays.*

Your doctor will likely tell you not to eat or drink anything after midnight before your procedure. Your doctor will tell you which medications you may take the morning of your procedure.

You should plan to stay overnight at the hospital for one or more days.

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The nurse will give you a gown to wear during the procedure.

What does the equipment look like?

During ureteral stenting, a fluoroscope and a guide wire are used to place a stent into the ureter.

A guide wire may be inserted with the aid of a fluoroscope, an imaging device that uses x-rays to see structures on a fluorescent screen.

A stent is 10 to 15 inches long and less than a quarter inch thick.

During a nephrostomy, a fluoroscope, or an ultrasound, and a needle are used to place a catheter in the kidney.

A catheter is a long, thin plastic tube that is about 1/4 inch in diameter.

Ultrasound machines consist of a computer console, video monitor and an attached transducer (http://www.radiologyinfo.org) . The transducer is a small hand-held device that resembles a microphone. Some exams may use different transducers (with different capabilities) during a single exam. The transducer sends out inaudible, high-frequency sound waves into the body and listens for the returning echoes. The same principles apply to sonar used by boats and submarines.

The radiologic technologist applies a small amount of gel to the area under examination and places the transducer there. The gel allows sound waves to travel back and forth between the transducer and the area under examination. The ultrasound image is immediately visible on a video monitor. The computer creates the image based on the loudness (amplitude), pitch (frequency), and time it takes for the ultrasound signal to return to the transducer. It also considers what type of body structure and/or tissue the sound is traveling through.

This procedure may use other equipment, including an intravenous (http://www.radiologyinfo.org) line (IV), ultrasound machine and devices that monitor your heart beat and blood pressure.

How are these procedures performed?

Image-guided, minimally invasive procedures such as ureteral stenting and nephrostomy are most often performed by a specially trained interventional radiologist (http://www.radiologyinfo.org) in an interventional radiology (http://www.radiologyinfo.org) suite or occasionally in the operating room.

This procedure is often done on an outpatient basis. However, some patients may require admission following the procedure. Ask your doctor if you will need to be admitted.

Prior to your procedure, your doctor may perform ultrasound (http://www.radiologyinfo.org) , computed tomography (CT), or magnetic resonance imaging (http://www.radiologyinfo.org) (MRI) exams.

Your doctor may provide medications to help prevent nausea and pain and antibiotics to help prevent infection.

The doctor or nurse may connect you to monitors that track your heart rate, blood pressure, oxygen level, and pulse.

A nurse or radiologic technologist (http://www.radiologyinfo.org) will insert an intravenous (http://www.radiologyinfo.org) (IV) line into a vein in your hand or arm to administer a sedative. This procedure may use moderate sedation. It does not require a breathing tube. However, some patients may require general anesthesia (http://www.radiologyinfo.org) .

If you receive moderate sedation, you will be asleep but have the ability to be awakened. The sedation will be administered and monitored by your physician and nursing staff.

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If you receive a general anesthetic (http://www.radiologyinfo.org) , you will be unconscious for the entire procedure. An anesthesiologist (http://www.radiologyinfo.org) will monitor your condition. If you receive conscious sedation, a nurse will administer medications to make you drowsy and comfortable and monitor you during the procedure.

The nurse will sterilize the area of your body where the catheter is to be inserted. They will sterilize and cover this area with a surgical drape.

Your doctor will numb the area with a local anesthetic (http://www.radiologyinfo.org) . This may briefly burn or sting before the area becomes numb.

The interventional radiologist will use x-rays and/or ultrasound to locate your kidney and a needle will be inserted through your skin into the kidneys. Contrast material will be injected through the needle.

During ureteral stenting, you are positioned on your stomach. Using a fluoroscope (http://www.radiologyinfo.org) to see the ureter, a guide wire is inserted into the ureter. The stent is run over the guide wire and placed within the ureter. Once the stent has been placed, the guide wire may be removed, or a nephrostomy catheter may be left in place for a day or two and then removed.

When the procedure is complete, the doctor will remove the catheter and apply pressure to stop any bleeding. No stitches are visible on the skin. The nurse will cover this tiny opening in the skin with a dressing.

During nephrostomy, you are positioned on your stomach. Using a fluoroscope to see the kidney, a guide wire is inserted into the kidney, followed by a catheter. This will be left in place until a ureteral stent can be placed or the ureteral blockage is resolved. Most commonly, the nephrostomy catheter is connected to an external bag that collects urine. Prior to leaving the hospital, you will be instructed on how to empty and care for the drainage bag. For prolonged durations, the catheter may require routine check and changes every two to three months.

The doctor or nurse will remove your IV line before you go home.

Both procedures are usually completed within one hour.

What will I experience during and after the procedure?

The doctor or nurse will attach devices to your body to monitor your heart rate and blood pressure.

You will feel a slight pinch when the nurse inserts the needle into your vein for the IV line and when they inject the local anesthetic. Most of the sensation is at the skin incision site. The doctor will numb this area using local anesthetic. You may feel pressure when the doctor inserts the catheter into the vein or artery. However, you will not feel serious discomfort.

If the procedure uses sedation, you will feel relaxed, sleepy, and comfortable. You may or may not remain awake, depending on how deeply you are sedated.

You may feel slight pressure as the catheter is inserted into the kidney and down the ureter. During placement of a ureteral stent, until the stent is positioned, you may feel pressure as the guide wire is inserted into the bladder resulting in a sensation to urinate. You may experience blood-tinged urine for several days following the procedure, which will usually clear up on its own.

You will remain in the recovery room until you are completely awake and ready to return home.

You will not feel when the contrast is excreted into the urine.

You should be able to resume your normal activities within a few days.

Who interprets the results and how do I get them?

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After the procedure is complete, the interventional radiologist (http://www.radiologyinfo.org) will tell you whether the procedure was a success.

Your interventional radiologist may recommend a follow-up visit.

This visit may include a physical check-up, imaging exam(s), and blood tests. During your follow-up visit, tell your doctor if you have noticed any side effects or changes.

What are the benefits vs. risks?

Benefits

- A ureteral stent or nephrostomy catheter will allow urine to flow again from the kidney and permit the kidney to function normally.

Risks

- Any procedure that penetrates the skin carries a risk of infection. The chance of infection requiring antibiotic treatment appears to be less than one in 1,000.
- Rarely, you may experience ongoing spasm of the bladder after placement of a ureteral stent. If this happens, notify you doctor. This spasm may be treated with medication.
- Because the kidney is an organ with a substantial amount of blood flow to it, bleeding is a possible but rare complication. There is also a small risk of damage to surrounding organs. Imaging guidance is used to minimize this risk.
- There is a very slight risk of an allergic reaction if the procedure uses an injection of contrast material (http://www.radiologyinfo.org) .

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