

Cystoscopy and Ureteroscopy

National Kidney and Urologic Diseases Information Clearinghouse



What are cystoscopy and ureteroscopy?

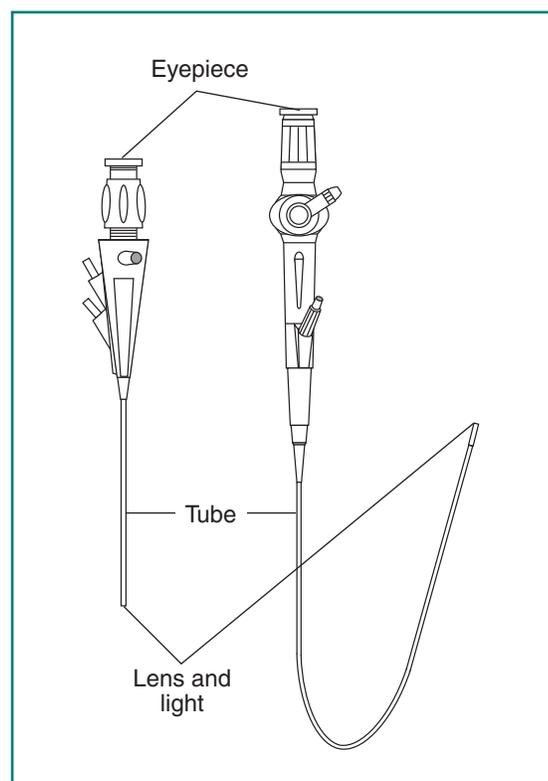
Cystoscopy and ureteroscopy are common procedures performed by a urologist to look inside the urinary tract. A urologist is a doctor who specializes in urinary tract problems.

Cystoscopy. Cystoscopy uses a cystoscope to look inside the urethra and bladder. A cystoscope is a long, thin optical instrument with an eyepiece at one end, a rigid or flexible tube in the middle, and a tiny lens and light at the other end of the tube. By looking through the cystoscope, the urologist can see detailed images of the lining of the urethra and bladder. The urethra and bladder are part of the urinary tract.

Ureteroscopy. Ureteroscopy uses a ureteroscope to look inside the ureters and kidneys. Like a cystoscope, a ureteroscope has an eyepiece at one end, a rigid or flexible tube in the middle, and a tiny lens and light at the other end of the tube. However, a ureteroscope is longer and thinner than a cystoscope so the urologist can see detailed images of the lining of the ureters and kidneys. The ureters and kidneys are also part of the urinary tract.

What is the urinary tract and how does it work?

The urinary tract is the body's drainage system for removing urine, which is composed of wastes and extra fluid. In order for normal urination to occur, all body parts



Rigid cystoscope (left) and flexible ureteroscope (right)

in the urinary tract need to work together in the correct order.

Kidneys. The kidneys are two bean-shaped organs, each about the size of a fist. They are located just below the rib cage, one on each side of the spine. Every day, the kidneys filter about 120 to 150 quarts of blood to produce about 1 to 2 quarts of urine. The kidneys work around the clock; a person does not control what they do.

Ureters. Ureters are the thin tubes of muscle—one on each side of the bladder—that carry urine from each of the kidneys to the bladder.

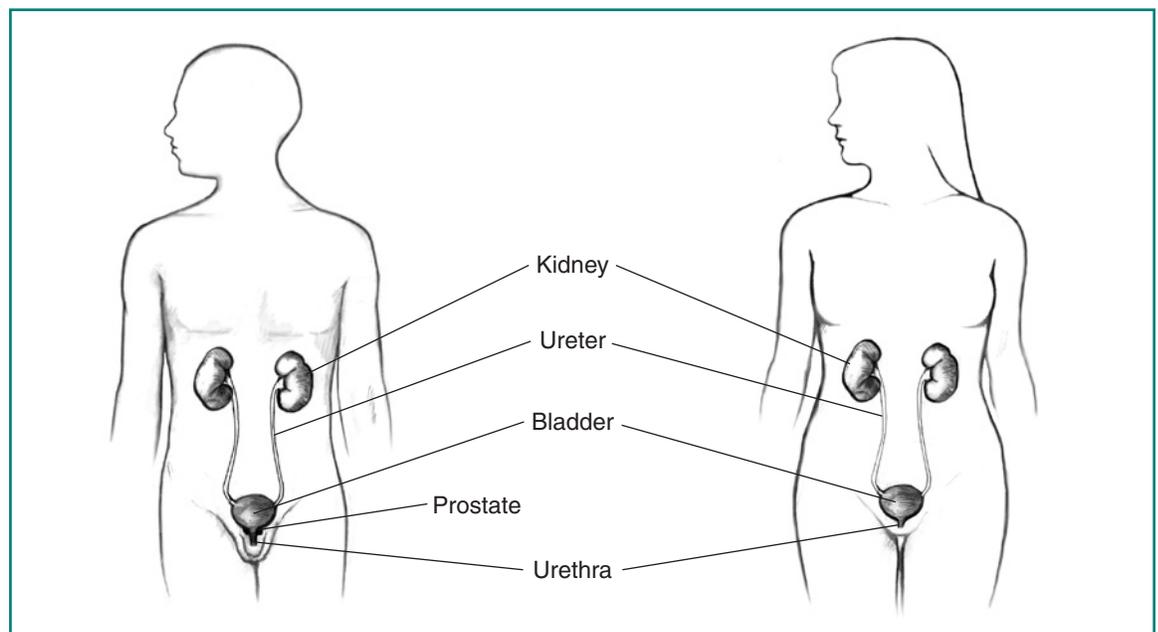
Bladder. The bladder, located in the pelvis between the pelvic bones, is a hollow, muscular, balloon-shaped organ that expands as it fills with urine. Although a person does not control kidney function, a person does control when the bladder empties. Bladder emptying is known as urination. The bladder stores urine until the person finds an appropriate time and place to urinate. A normal bladder acts like a reservoir and can hold 1.5 to 2 cups of urine. How often a person needs to urinate depends on how quickly the kidneys produce the urine that fills the bladder. The muscles of the bladder wall remain relaxed while the bladder fills with urine. As the bladder fills to capacity, signals sent to the brain tell a person to find

a toilet soon. During urination, the bladder empties through the urethra, located at the bottom of the bladder.

Three sets of muscles work together like a dam, keeping urine in the bladder.

The first set is the muscles of the urethra itself. The area where the urethra joins the bladder is the bladder neck. The bladder neck, composed of the second set of muscles known as the internal sphincter, helps urine stay in the bladder. The third set of muscles is the pelvic floor muscles, also referred to as the external sphincter, which surround and support the urethra.

To urinate, the brain signals the muscular bladder wall to tighten, squeezing urine out of the bladder. At the same time, the brain signals the sphincters to relax. As the sphincters relax, urine exits the bladder through the urethra.



Male (left) and female (right) urinary tracts

Why is a cystoscopy or ureteroscopy performed?

A urologist performs a cystoscopy or ureteroscopy to find the cause of, and sometimes treat, urinary tract problems.

Cystoscopy. A urologist performs a cystoscopy to find the cause of urinary tract problems such as

- frequent urinary tract infections (UTIs)
- hematuria—blood in the urine
- urinary frequency—urination eight or more times a day
- urinary urgency—the inability to delay urination
- urinary retention—the inability to empty the bladder completely
- urinary incontinence—the accidental loss of urine
- pain or burning before, during, or after urination
- trouble starting urination, completing urination, or both
- abnormal cells, such as cancer cells, found in a urine sample

During a cystoscopy, a urologist can see

- stones—solid pieces of material in the bladder that may have formed in the kidneys or in the bladder when substances that are normally in the urine become highly concentrated.
- abnormal tissue, polyps, tumors, or cancer in the urethra or bladder.
- stricture, a narrowing of the urethra. Stricture can be a sign of an enlarged prostate in men or of scar tissue in the urethra.

During a cystoscopy, a urologist can treat problems such as bleeding in the bladder and blockage in the urethra. A urologist may also use a cystoscopy to

- remove a stone in the bladder or urethra.
- remove or treat abnormal tissue, polyps, and some types of tumors.
- take small pieces of urethral or bladder tissue for examination with a microscope—a procedure called a biopsy.
- inject material into the wall of the urethra to treat urinary leakage.
- inject medication into the bladder to treat urinary leakage.
- obtain urine samples from the ureters.
- perform retrograde pyelography—an x-ray procedure in which a urologist injects a special dye, called contrast medium, into a ureter to the kidney to create images of urinary flow. The test can show causes of obstruction, such as kidney stones and tumors.
- remove a stent that was placed in the ureter after a ureteroscopy with biopsy or stone removal. A stent is a small, soft tube.

Ureteroscopy. In addition to the causes of urinary tract problems he or she can find with a cystoscope, a urologist performs a ureteroscopy to find the cause of urine blockage in a ureter or to evaluate other abnormalities inside the ureters or kidneys.

During a ureteroscopy, a urologist can see

- a stone in a ureter or kidney
- abnormal tissue, polyps, tumors, or cancer in a ureter or in the lining of a kidney

During a ureteroscopy, a urologist can treat problems such as urine blockage in a ureter. The urologist can also

- remove a stone from a ureter or kidney
- remove or treat abnormal tissue, polyps, and some types of tumors
- perform a biopsy of a ureter or kidney

After a ureteroscopy, the urologist may need to place a stent in a ureter to drain urine from the kidney to the bladder while swelling in the ureter goes away. The stent, which is completely inside the body, may cause some discomfort in the kidney or bladder area. The discomfort is generally mild. The stent may be left in the ureter for a few days to a week or more. The urologist may need to perform a cystoscopy to remove the stent in the ureter.

How does a patient prepare for a cystoscopy or ureteroscopy?

In many cases, a patient does not need special preparations for a cystoscopy. A health care provider may ask the patient to drink plenty of liquids before the procedure, as well as urinate immediately before the procedure.

The patient may need to give a urine sample to test for a UTI. If the patient has a UTI, the urologist may treat the infection with

antibiotics before performing a cystoscopy or ureteroscopy. A health care provider will provide instructions before the cystoscopy or ureteroscopy. These instructions may include

- when to stop certain medications, such as blood thinners
- when to stop eating and drinking
- when to empty the bladder before the procedure
- arranging for a ride home after the procedure

The urologist will ask about the patient's medical history, current prescription and over-the-counter medications, and allergies to medications, including anesthetics. The urologist will talk about which anesthetic is best for the procedure and explain what the patient can expect after the procedure.

How is a cystoscopy or ureteroscopy performed?

A urologist performs a cystoscopy or ureteroscopy during an office visit or in an outpatient center or a hospital. For some patients, the urologist will apply an anesthetic gel around the urethral opening or inject a local anesthetic into the urethra. Some patients may require sedation or general anesthesia. The urologist often gives patients sedatives and general anesthesia for a

- ureteroscopy
- cystoscopy with biopsy
- cystoscopy to inject material into the wall of the urethra
- cystoscopy to inject medication into the bladder

For sedation and general anesthesia, a nurse or technician places an intravenous (IV) needle in a vein in the arm or hand to give the medication. Sedation helps the patient relax and be comfortable. General anesthesia puts the patient into a deep sleep during the procedure. The medical staff will monitor the patient's vital signs and try to make him or her as comfortable as possible. During both procedures, a woman will lie on her back with the knees up and spread apart. During a cystoscopy, a man can lie on his back or be in a sitting position.

After the anesthetic has taken effect, the urologist gently inserts the tip of the cystoscope or ureteroscope into the urethra and slowly glides it through the urethra and into the bladder. A sterile liquid—water or salt water, called saline—flows through the cystoscope or ureteroscope to slowly fill the bladder and stretch it so the urologist has a better view of the bladder wall. As the bladder fills with liquid, the patient may feel some discomfort and the urge to urinate. The urologist may remove some of the liquid from the bladder during the procedure. As soon as the procedure is over, the urologist may remove the liquid from the bladder or the patient may empty the bladder.

For a cystoscopy, the urologist examines the lining of the urethra as he or she passes the cystoscope into the bladder. The urologist then examines the lining of the bladder. The urologist can insert small instruments through the cystoscope to treat problems in the urethra and bladder or perform a biopsy.

For a ureteroscopy, the urologist passes the ureteroscope through the bladder and into a ureter. The urologist then examines the lining of the ureter. He or she may pass the ureteroscope all the way up into the kidney. The urologist can insert small instruments through the ureteroscope to treat problems in the ureter or kidney or perform a biopsy.

When a urologist performs a cystoscopy or a ureteroscopy to make a diagnosis, both procedures—including preparation—take 15 to 30 minutes. The time may be longer if the urologist removes a stone in the bladder or a ureter or if he or she performs a biopsy.

What can a patient expect after a cystoscopy or ureteroscopy?

After a cystoscopy or ureteroscopy, a patient may

- have a mild burning feeling when urinating
- see small amounts of blood in the urine
- have mild discomfort in the bladder area or kidney area when urinating
- need to urinate more frequently or urgently

These problems should not last more than 24 hours. The patient should tell a health care provider right away if bleeding or pain is severe or if problems last more than a day.

The health care provider may recommend that the patient

- drink 16 ounces of water each hour for 2 hours after the procedure
- take a warm bath to relieve the burning feeling
- hold a warm, damp washcloth over the urethral opening to relieve discomfort
- take an over-the-counter pain reliever

The health care provider may prescribe an antibiotic to take for 1 or 2 days to prevent an infection. A patient should report any signs of infection—including severe pain, chills, or fever—right away to the health care provider.

Most patients go home the same day as the procedure. Recovery depends on the type of anesthesia. A patient who receives only a local anesthetic can go home immediately. A patient who receives general anesthesia may have to wait 1 to 4 hours before going home. A health care provider usually asks the patient to urinate before leaving. In some cases, the patient may need to stay overnight in the hospital. A health care provider will provide discharge instructions for rest, driving, and physical activities after the procedure.

What are the risks of cystoscopy and ureteroscopy?

The risks of cystoscopy and ureteroscopy include

- UTIs
- abnormal bleeding
- abdominal pain
- a burning feeling or pain during urination
- injury to the urethra, bladder, or ureters
- urethral narrowing due to scar tissue formation
- the inability to urinate due to swelling of surrounding tissues
- complications from anesthesia

Seek Immediate Medical Care

A patient who has any of the following symptoms after a cystoscopy or ureteroscopy should call or see a health care provider right away:

- the inability to urinate and the feeling of a full bladder
- burning or painful urination that lasts more than 2 days
- bright red urine or blood clots in the urine
- a fever, with or without chills
- severe discomfort

Points to Remember

- Cystoscopy and ureteroscopy are common procedures performed by a urologist to look inside the urinary tract.
- Cystoscopy uses a cystoscope to look inside the urethra and bladder.
- Ureteroscopy uses a ureteroscope to look inside the ureters and kidneys.
- A urologist performs a cystoscopy or ureteroscopy to find the cause of, and sometimes treat, urinary tract problems.
- In many cases, a patient does not need special preparations for a cystoscopy.
- A urologist performs a cystoscopy or ureteroscopy during an office visit or in an outpatient center or a hospital.
- After a cystoscopy or ureteroscopy, a patient may
 - have a mild burning feeling when urinating
 - see small amounts of blood in the urine
 - have mild discomfort in the bladder area or kidney area when urinating
 - need to urinate more frequently or urgently
- These problems should not last more than 24 hours.
- Most patients go home the same day as the procedure.

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) conducts and supports research into many kinds of urinary tract disorders, including urinary retention. The knowledge gained from these studies is advancing scientific understanding of why urinary tract disorders develop, leading to improved methods of diagnosing, treating, and preventing them.

Clinical trials are research studies involving people. Clinical trials look at safe and effective new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. To learn more about clinical trials, why they matter, and how to participate, visit the NIH Clinical Research Trials and You website at www.nih.gov/health/clinicaltrials. For information about current studies, visit www.ClinicalTrials.gov.

For More Information

Interstitial Cystitis Association

1760 Old Meadow Road, Suite 500
McLean, VA 22102
Phone: 703-442-2070
Fax: 703-506-3266
Email: icemail@ichelp.org
Internet: www.ichelp.org

Urology Care Foundation

1000 Corporate Boulevard
Linthicum, MD 21090
Phone: 1-800-828-7866 or 410-689-3700
Fax: 410-689-3998
Email: info@urologycarefoundation.org
Internet: www.UrologyHealth.org

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You may also find additional information about this topic by visiting MedlinePlus at www.medlineplus.gov.

This publication may contain information about medications and, when taken as prescribed, the conditions they treat. When prepared, this publication included the most current information available. For updates or for questions about any medications, contact the U.S. Food and Drug Administration toll-free at 1-888-INFO-FDA (1-888-463-6332) or visit www.fda.gov. Consult your health care provider for more information.

National Kidney and Urologic Diseases Information Clearinghouse

3 Information Way
Bethesda, MD 20892-3580
Phone: 1-800-891-5390
TTY: 1-866-569-1162
Fax: 301-634-0716
Email: nkudic@info.niddk.nih.gov
Internet: www.urologic.niddk.nih.gov

The National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health of the U.S. Department of Health and Human Services. Established in 1987, the Clearinghouse provides information about diseases of the kidneys and urologic system to people with kidney and urologic disorders and to their families, health care professionals, and the public. The NKUDIC answers inquiries, develops and distributes publications, and works closely with professional and patient organizations and Government agencies to coordinate resources about kidney and urologic diseases.

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