

What I need to know about

My Child's Urinary Tract Infection



U.S. Department
of Health and
Human Services

NATIONAL INSTITUTES OF HEALTH

NIDDK | NATIONAL INSTITUTE OF
DIABETES AND DIGESTIVE
AND KIDNEY DISEASES

ADULT PEDIATRIC UROLOGY &
UROGYNECOLOGY

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PEDIATRICUROGYNECOLOGY



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What is a urinary tract infection (UTI)?

A UTI is an infection in the urinary tract.

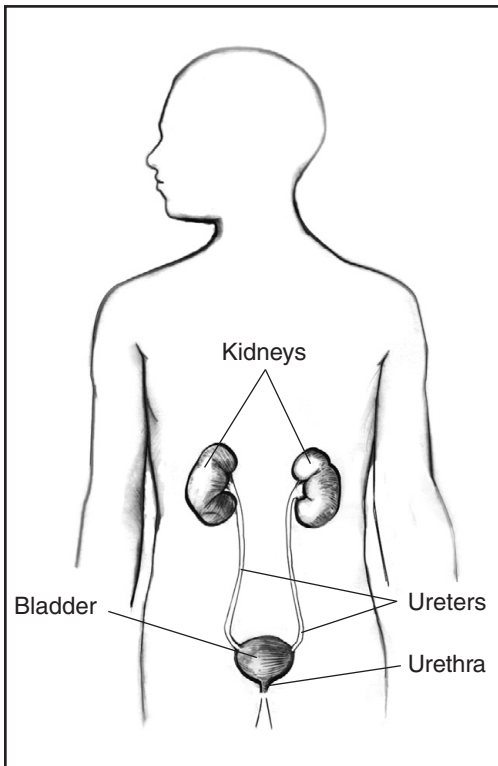
Infections are caused by microbes—organisms too small to be seen without a microscope. **Bacteria*** are the most common cause of UTIs. Normally, bacteria that enter the urinary tract are quickly removed by the body before they cause symptoms. But sometimes bacteria overcome the body's natural defenses and cause infection.

What is the urinary tract?

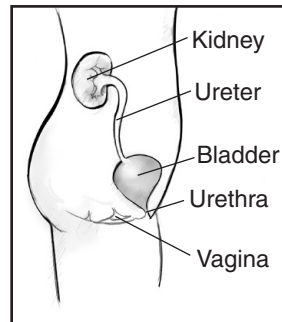
The **urinary tract** is the body's drainage system for removing wastes and extra water. The urinary tract includes two **kidneys**, two **ureters**, a **bladder**, and a **urethra**. The kidneys are a pair of bean-shaped organs, each about the size of a fist. They are located below the ribs, one on each side of the spine, toward the middle of the back. Every minute, the two kidneys process about 3 ounces of blood, removing wastes and extra water. The wastes and extra water make up the 1 to 2 quarts of urine produced each day. Children produce

*See page 16 for tips on how to say the words in **bold** type.

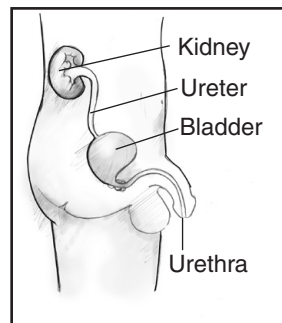
less urine each day; the amount produced depends on their age. The urine travels from the kidneys down two narrow tubes called the ureters. The urine is then stored in a balloonlike organ called the bladder and emptied through the urethra, a tube at the bottom of the bladder. The opening of the urethra is at the end of the penis in boys and in front of the vagina in girls.



Front view of the urinary tract



Side view of the female urinary tract



Side view of the male urinary tract

What causes UTIs?

Most UTIs are caused by bacteria that live in the bowel, the part of the digestive tract where stool is changed from liquid to solid. The bacterium *Escherichia coli* (*E. coli*) causes most UTIs. The urinary tract has several systems to prevent infection. The points where the ureters attach to the bladder act like one-way valves to prevent urine from backing up, or refluxing, toward the kidneys, and **urination** washes microbes out of the body. The body's natural defenses also prevent infection. But despite these safeguards, infections still occur.

Other factors that may cause a child to get a UTI include the following:

- **Waiting to urinate.** Regular urination helps flush away bacteria. Holding urine allows bacteria to grow.
- **Making too little urine.** A child that doesn't drink enough fluids may not make enough urine to flush away bacteria.
- **Constipation.** Constipation is a condition in which a child has fewer than two bowel movements a week. Stools can be hard, dry, small, and difficult to pass. The hard stool in the bowel may press against the urinary tract and block the flow of urine, allowing bacteria to grow.

Some children are just more prone to UTIs than others, just as some children are more prone to getting coughs, colds, or ear infections.

Who gets UTIs?

Any child can get a UTI, though girls get UTIs more often than boys.

Children with a condition called **vesicoureteral reflux** (VUR) are at higher risk for UTIs. VUR causes urine to reflux at the point where one or both ureters attach to the bladder. When urine stays in the urinary tract, bacteria have a chance to grow and spread. Infants and young children who get a UTI often have VUR.

Boys younger than 6 months who are not **circumcised** are at greater risk for a UTI than circumcised boys the same age. Boys who are circumcised have had the foreskin, which is the skin that covers the tip of the penis, removed.

Are UTIs serious?

Most UTIs are not serious, but some infections can lead to serious problems. Chronic kidney infections—infections that recur or last a long time—can cause permanent damage. This damage can include kidney scars, poor kidney function, high blood pressure, and other problems. Some acute kidney infections—infections that develop suddenly—can be life threatening, especially if the bacteria enter the bloodstream.

What are the symptoms of a UTI?

A child with a UTI may not have any symptoms. When symptoms are present, they can range from mild to severe. UTI symptoms can include

- fever
- pain or burning during urination with only a few drops of urine at a time
- irritability
- not eating
- **nausea**
- **diarrhea**

- **vomiting**
- cloudy, dark, bloody, or foul-smelling urine
- urinating often
- pain in the back or side below the ribs
- leaking urine into clothes or bedding in older children



UTI symptoms can include irritability.

When should I call a health care provider?

Call a health care provider right away if your child has any of these symptoms:

- a fever of 100.4 degrees or higher in an infant or 101 degrees or higher in an older child
- a burning feeling during urination
- frequent or intense urges to urinate, even when there is little urine to pass
- pain in the back or side below the ribs
- cloudy, dark, bloody, or foul-smelling urine

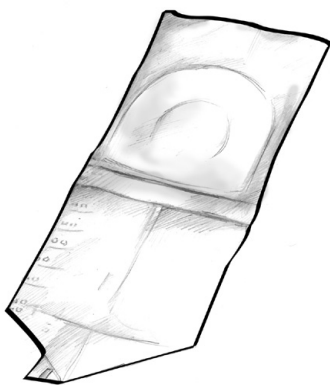


Call a health care provider if your child has symptoms of a UTI.

How are UTIs diagnosed?

A UTI is diagnosed by testing a sample of your child's urine. The way the urine is collected depends on your child's age:

- If your child is still in diapers, the health care provider may place a plastic collection bag over your child's genital area after the area around the urethra has been washed with soap and warm water or a sterile wipe. The bag will be sealed to your child's skin with an **adhesive** strip. The bag should be removed as soon as your child urinates into it, and the urine sample should be processed right away.



Plastic collection bag

- For infants, urine may need to be collected using a thin tube called a **catheter**. When using a catheter, the health care provider first cleans the area around the opening of the urethra with a germ-killing solution. The catheter is inserted gently into the urethra until it reaches the bladder. The bladder is then drained into a clean container. Using a catheter prevents bacteria on the skin from getting into the urine sample.
- Another method for collecting a urine sample from infants is to insert a needle directly into the bladder through the skin of the lower stomach. Using a needle also prevents bacteria on the skin from getting into the urine sample.
- Older children are given a cup to urinate into.

The health care provider looks at the urine sample with a microscope to check for bacteria or pus. The sample is also sent to a lab. The lab performs a urine culture by placing the sample in a tube or dish with a substance that encourages any bacteria present to grow. The bacteria that grow can be identified and tested to see which medicines will work best to treat the infection. A urine culture usually takes 1 to 3 days to complete.

How are UTIs treated?

Bacteria-fighting medicines called **antibiotics** are used to treat a UTI. While the lab is doing the urine culture, the health care provider may begin treatment with an antibiotic that treats the bacteria most likely to be causing the infection. Once culture results are known, the health care provider may switch your child to a different antibiotic that targets the specific type of bacteria.

Your child will need to take antibiotics for at least 3 to 5 days and maybe as long as several weeks. Be sure your child takes every pill or every dose of liquid. Your child should feel better after a couple of days, but the infection might come back if your child stops taking the antibiotic too early.

You should let your child drink as much as your child wants. But don't force your child to drink large amounts of fluid. Call your child's health care provider if your child doesn't want to or isn't able to drink. Also, talk with your child's health care provider if your child needs medicine for the pain of a UTI. The health care provider can recommend an over-the-counter pain medicine. A heating pad on the back or abdomen may also help.



You should let your child drink as much as your child wants.

Will my child need more tests after the UTI is gone?

Talk with your child's health care provider after your child's UTI is gone. The health care provider may want to do more tests to check for VUR or a blockage in the urinary tract. Repeated infections in an abnormal urinary tract may cause kidney damage. The kinds of tests ordered will depend on the child and the type of infection. VUR and blockages in the urinary tract often go away as a child grows. In some cases, surgery may be needed to correct any defects in the urinary tract. More information about tests for VUR or a blockage in the urinary tract can be found in the National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC) fact sheet *Urinary Tract Infections in Children* at www.urologic.niddk.nih.gov.



Pictures of the urinary tract may show that your child has VUR or a blockage in the urinary tract.

How can UTIs be prevented?

You can take the following steps to help prevent your child from getting a UTI:

- Teach your child not to hold in urine and to go to the bathroom whenever your child feels the urge.
- Teach your child how to properly clean himself or herself after using the bathroom to keep bacteria from entering the urinary tract.
- Have your child wear loose-fitting clothes. Tight clothes can trap moisture, which allows bacteria to grow.
- Buy your child cotton underwear. Cotton lets in air to dry the area.
- If your child has constipation, talk with a health care provider about the best treatment options.

Eating, Diet, and Nutrition

To help prevent a UTI, make sure your child drinks enough fluids each day. Talk with your child's health care provider to find out how much fluid your child should drink.

Points to Remember

- A urinary tract infection (UTI) is an infection in the urinary tract. Infections are caused by microbes—organisms too small to be seen without a microscope.
- Most UTIs are caused by bacteria that live in the bowel, the part of the digestive tract where stool is changed from liquid to solid.
- Any child can get a UTI, though girls get UTIs more often than boys.
- Most UTIs are not serious, but some infections can lead to serious problems.
- A child with a UTI may not have any symptoms. When symptoms are present, they can range from mild to severe.
- A UTI is diagnosed by testing a sample of your child's urine.
- Bacteria-fighting medicines called antibiotics are used to treat a UTI.
- Talk with your child's health care provider after your child's UTI is gone. The health care provider may want to do more tests to check for vesicoureteral reflux (VUR) or a blockage in the urinary tract.
- You can take steps to help prevent your child from getting a UTI.

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) sponsors several programs aimed at understanding urologic diseases in adults and children. The NIDDK's Division of Kidney, Urologic, and Hematologic Diseases supports efforts to develop more effective treatments for UTIs in children caused by VUR. The Randomized Intervention for Vesicoureteral Reflux (RIVUR) is a multicenter trial designed to determine whether taking antibiotics every day is an effective way to prevent recurrence of UTIs in children with VUR. More information about the RIVUR study, funded under National Institutes of Health clinical trial number NCT00405704, can be found at www.csc.unc.edu/rivur.

Participants in clinical trials can play a more active role in their own health care, gain access to new research treatments before they are widely available, and help others by contributing to medical research. For information about current studies, visit www.ClinicalTrials.gov.

Pronunciation Guide

adhesive (ad-HEE-siv)

antibiotics (AN-tee-by-OT-ikss)

bacteria (bak-TIHR-ee-uh)

bladder (BLAD-ur)

catheter (KATH-uh-tur)

circumcised (SUR-kuhm-sydz)

constipation (KON-stih-PAY-shuhn)

diarrhea (DY-uh-REE-uh)

Escherichia coli (esh-uh-RIK-ee-uh) (KOH-ly)

kidneys (KID-nee-z)

nausea (NAW-zee-uh)

ureters (YOOR-uh-turz)

urethra (yoo-REE-thruh)

urinary tract (YOOR-ih-NAIR-ee) (trakt)

urination (YOOR-ih-nay-shuhn)

vesicoureteral reflux (VESS-ih-koh-yoo-REE-tur-uhl)
(REE-fluhks)

vomiting (VOM-it-ing)

For More Information

The NKUDIC has a fact sheet called *Vesicoureteral Reflux* that gives more information about VUR and a fact sheet called *Urine Blockage in Newborns* that gives more information about urinary blockages in infants.

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This publication is available at www.urologic.niddk.nih.gov.

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