

Urinary tract infections in children

URINARY TRACT INFECTION OVERVIEW — The urinary system includes two kidneys (that filter urine), two ureters (that move urine from the kidneys to the bladder), the bladder (that holds urine), and the urethra (that carries urine out of the bladder) ([figure 1](#)). Bacteria (germs) do not normally live in these areas. When bacteria enter the bladder or kidneys, an infection can develop. These infections are called urinary tract infections (UTI).

Kidney infections are the most serious type of UTI because, if not treated quickly, the infection can permanently damage the kidneys. Damage to the kidney can lead to high blood pressure and kidney failure later in life.

Urinary tract infections in adolescents and adults are discussed separately. (See "[Patient information: Bladder infections in adolescents and adults](#)".) More detailed information about urinary tract infections in children is available by subscription. (See "[Clinical features and diagnosis of urinary tract infections in children](#)" and "[Acute management, imaging, and prognosis of urinary tract infections in children](#)" and "[Acute cystitis in children older than two years and adolescents](#)".)

URINARY TRACT INFECTION CAUSES — In healthy children, most urinary tract infections (UTI) are caused by *Escherichia coli* (*E. coli*) bacteria, which are normally found in stool. These bacteria can move from the anus to the urethra and into the bladder (and sometimes up into the kidney) causing infection.

Risk factors — Some children have a higher chance of developing a UTI. The following are some risk factors for UTI:

- Young age; boys younger than one year old, and girls younger than four years of age are at highest risk.
- Being uncircumcised; there is a four to 10 times higher risk of UTIs in uncircumcised boys. Still, most uncircumcised boys do NOT develop UTIs. (See "[Patient information: Circumcision in baby boys](#)".)
- Having a bladder catheter for a prolonged period of time.
- Having parts of the urinary tract that did not form correctly before birth.
- Having a bladder that does not work properly.
- Having one UTI increases the chance of getting another UTI.

URINARY TRACT INFECTION SYMPTOMS — Symptoms of a urinary tract infection depend on the child's age.

Older children — Children older than two years often have:

- Pain or burning when urinating
- Frequent need to urinate
- Pain in the lower abdomen or sides of the back ([figure 2](#))
- Fever (higher than 100.4°F or 38°C) (see "[Patient information: Fever in children](#)")

Younger children — Symptoms in children younger than two years may include one or more of the following:

- Fever, which may be the only symptom
- Vomiting or diarrhea
- Irritability or fussiness
- Poor feeding, poor weight gain

URINARY TRACT INFECTION DIAGNOSIS — If you are concerned that your child has a urinary tract infection (UTI), make an appointment with the child's doctor or nurse within 24 hours. Waiting to start treatment can increase the risk of damage to the kidneys.

Urine testing — A urine sample is needed to determine if the child has a UTI. In young children who are not toilet trained, it is usually necessary to insert a thin sterile tube (a catheter) into the bladder to obtain a urine sample.

In older children who can use the toilet, you can collect a urine sample by having the child urinate into a sterile cup.

After obtaining the urine, a urine dipstick test is usually done in the office. If the test is positive for a UTI, the doctor or nurse will send the urine sample to a lab for urine culture to confirm the diagnosis. The culture helps decide which antibiotic is best. It takes up to 48 hours for germs to grow, so the culture results are not available right away.

Based on the child's symptoms and the results of the dipstick test, the doctor or nurse may decide to start antibiotics before urine culture results are available.

Imaging tests — Imaging tests, such as ultrasound or x-ray, can show if a child's urinary system did not form correctly before birth. If the urinary system is abnormal, a child is more likely to have UTIs. Testing may include a kidney ultrasound and a voiding cystourethrogram (VCUG). Imaging tests are generally done in younger children (less than three to five years old) or in children who have had more than one UTI.

Kidney ultrasound — Ultrasound uses sound waves to create a picture of the kidneys. During the test, gel is applied to the skin on the child's back and abdomen and a small wand-like device is pressed against the body. The test is not painful and usually takes less than 30 minutes.

Voiding cystourethrogram — A voiding cystourethrogram (VCUG) is an x-ray test that shows the outline of the child's bladder and urethra. The test can also show if urine flows from the bladder backwards into the ureters or kidneys; this is called vesicoureteral reflux. Reflux may increase the chance that a child will have kidney infections.

This test takes about one to two hours to complete and involves putting a catheter into the child's bladder. Dye is put into the child's bladder through the catheter and x-rays are taken before and after the child urinates.

URINARY TRACT INFECTION TREATMENT — Antibiotics are used to treat urinary tract infections (UTI). The best antibiotic depends upon the child's age, the germ that caused the UTI, and the resistance that germs have. Most children who are older than two months are given an antibiotic by mouth, in a liquid or chewable tablet.

If the child is less than two months old, or if the child is vomiting and unable to take medicine by mouth, it may be necessary for the child to be admitted to the hospital for treatment with intravenous (IV) antibiotics.

Antibiotics are usually prescribed for a total of 5 to 14 days. In all cases, it is important for the child to take each dose of the antibiotic on time and to finish all of the medicine.

Response to treatment — Your child should begin to feel better within 24 to 48 hours of starting antibiotics. If your child does not get better or worsens, he or she should be seen again by a doctor or nurse. Most children who have a UTI have no long-term damage to the urinary tract from the infection. It is not necessary to have another urine test after a child has finished antibiotic treatment, as long as the UTI symptoms have resolved.

URINARY TRACT INFECTION PREVENTION — About 8 to 30 percent (1 in 5 to 10) of children who have a urinary tract infection (UTI) develop another UTI. This usually happens within the first six months after the first infection and is more common in girls. (See "[Long-term management and prevention of urinary tract infections in children](#)".)

Cranberry juice probably helps to prevent UTIs in healthy adult women and girls [1,2]. Cranberry juice has not been tested in boys. Nonetheless, it is safe to give four to six ounces of 100 percent cranberry juice per day to children between one and six years of age; children older than seven years may drink up to two four-ounce servings per day.

Preventive antibiotics — A low daily dose of an antibiotic may be recommended if your child gets frequent UTIs. This treatment is usually continued for 6 to 12 months.

WHEN TO SEEK HELP — If your child has any of the following, make an appointment with his or her doctor or nurse:

- Fever – Fever (temperature higher than 100.4°F or 38°C) may be the only symptom of urinary tract infection in infants and young children. In addition, any young child who develops a fever and has had a urinary tract infection (UTI) before should be seen within 24 hours.
- Pain or burning with urination or frequent urination.
- Back or abdominal pain.

WHERE TO GET MORE INFORMATION — Your child's healthcare provider is the best source of information for questions and concerns related to your child's medical problem.