

## **James L. Holly, M.D.**

### **Urinary Bladder Infections in Children**

**By: James L. Holly, MD**

Aside from unexpected wetting, the most common urinary problem among children is infections. An estimated 3 percent of girls and 1 percent of boys have had a urinary tract infection (UTI) by the age of 11. Some researchers believe these estimates are low because many cases of UTI go undetected. The symptoms are not always obvious to parents, and younger children are usually unable to describe how they feel. Recognizing and treating urinary tract infections is important. Untreated UTIs can lead to serious kidney problems that could threaten the life of your child.

The kidneys filter and remove waste and water from the blood to produce urine. They get rid of about 1-1/2 to 2 quarts of urine per day in an adult and less in a child, depending on the child's age. The urine travels from the kidneys down two narrow tubes called the ureters. The urine is then stored in a balloon-like container called the bladder. In a child, the bladder can hold about 1 to 1-1/2 ounces of urine for each year of the child's age. So, the bladder of a 4-year-old child may hold about 4 to 6 ounces (less than 1 cup); an 8-year-old can hold 8 to 12 ounces. When the bladder empties, urine flows out of the body 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.

Normal urine contains no bacteria (germs). Bacteria may, at times, get into the urinary tract (and the urine) from the skin around the rectum and genitals by traveling up the urethra into the bladder. When this happens, the bacteria can infect and inflame the bladder, resulting in swelling and pain in the lower abdomen and side. This is called "cystitis." If the bacteria travel further up through the ureters to the kidneys, a kidney infection can develop. The infection is usually accompanied by pain and fever. Kidney infections are much more serious than bladder infections.

The lining of the bladder, urethra, ureters, and kidneys become irritated with a urinary tract infection, just like the inside of the nose or throat with a cold. If your child is an infant or is only a few years old, the signs of a urinary tract infection may not be clear, since children that young cannot tell you just how they feel. Your child may have a high fever, be irritable, or not eat. On the other hand, sometimes a child may have only a low-grade fever, experience nausea and vomiting, or just not seem healthy. The diaper

urine may have an unusual smell. If your child has a high temperature and appears sick for more than a day without signs of a runny nose or other obvious cause for discomfort, he or she may need to be checked for a bladder infection.

An older child with bladder irritation may complain of pain in the abdomen and pelvic area. Your child may urinate often. If the kidney is infected, your child may complain of pain under the side of the rib cage (the flank) or low back pain. Crying or complaining that it hurts to urinate and producing only a few drops of urine at a time are other signs of urinary tract infection. Your child may have difficulty controlling the urine and may leak urine into clothing or bedsheets. The urine may smell unusual or look cloudy.

To diagnosis a UTI, urine will be examined under a microscope. If an infection is present, bacteria and sometimes pus will be in the urine. If the bacteria from the sample are hard to see at first, the health care provider may place the sample in a tube or dish with a substance that encourages any bacteria present to grow. Once the germs have multiplied, they can then be identified and tested to see which medications will provide the most effective treatment. The process of growing bacteria in the laboratory is known as performing a culture and often takes a day or more to complete. The reliability of the culture depends on how long the urine stands before the culture is started. If you collect your child's urine at home, it should be refrigerated as soon as collected and the container should be transported in a plastic bag filled with ice.

Urinary tract infections are treated with antibiotics (infection-fighting drugs). After a urine sample is obtained, the health care provider may begin treatment with a drug 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 another antibiotic, if necessary.

After a few doses of the antibiotic, your child may appear much better, but often several days may pass before all symptoms are gone. In any case, your child should take the medicine for as long as the doctor says. Do not stop medications because the symptoms have gone away. Infections may return, and germs can resist future treatment if the drug is stopped too soon.

Children should drink fluids when they wish. Make sure your child drinks what he or she needs, but do not force your child to drink large amounts of fluid. The health care provider needs to know if the child is not interested in drinking.

Once the infection has cleared, additional tests may be recommended to check for abnormalities in the urinary tract. Repeated infections in abnormal urinary tracts may cause kidney damage. The kinds of tests ordered will depend on your child and the type of urinary infection. Because no single test can tell everything about the urinary tract that might be important to know, more than one of the following tests may be needed:

**Kidney and bladder ultrasound:** A test that examines the kidney and bladder using sound waves. This test shows shadows of the kidney and bladder that may point out certain

abnormalities; this test cannot reveal all important urinary abnormalities. It also cannot measure how well a kidney works.

**Voiding cystourethrogram (VCUG):** A test that examines the urethra and bladder while the bladder fills and empties. A liquid that can be seen on x-rays is placed into the bladder through a catheter. The bladder is filled until the child urinates. This test can reveal abnormalities of the inside of the urethra and bladder. The test can also determine whether the flow of urine is normal when the bladder empties.

**Intravenous pyelogram:** A test that examines the whole urinary tract. A liquid that can be seen on x-rays is injected into a vein. The substance travels into the kidneys and bladder, revealing possible obstructions.

Many children who get urinary tract infections have normal kidneys and bladders, but children who have an abnormality need to have it detected as early as possible in life to try to protect their kidneys against damage. Abnormalities that could occur include the following:

**Vesicoureteral reflux.** Urine normally flows from the kidneys down the ureters to the bladder in one direction. With reflux, when the bladder fills, the urine may also flow backward from the bladder up the ureters to the kidneys. This abnormality is common in children with urinary infections.

**Urinary obstruction.** Blockages to urinary flow may occur at many sites in the urinary tract. Blockages usually occur if the ureter or urethra is too narrow or a kidney stone at some point stops the urinary flow from leaving the body. Occasionally, the ureter may join the kidney or bladder at the wrong place, preventing urine from leaving the kidney in a normal way.

Young children are at the greatest risk for kidney damage from urinary tract infections, especially if they have some unknown urinary tract abnormality. Such damage includes kidney scars, poor kidney growth, poor kidney function, high blood pressure, and other problems. For this reason it is important that children with urinary tract infections receive prompt treatment and careful evaluation.

Remember:

- Urinary tract infections occur in about 3 percent of girls and 1 percent of boys by age 11.
- A urinary tract infection in a young child may be a sign of an abnormality in the urinary tract that could lead to repeated problems.
- Symptoms of a urinary infection range from slight burning with urination or unusual smelling urine to severe pain and high fever.
- Untreated urinary infections can lead to serious kidney damage.
- Talk to a doctor if you suspect your child has a urinary tract infection.

It's your child's life and it's your child's life.