



Kapi'olani Pediatric Urology **Urinary Tract Infection**

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What causes urinary tract infections?

Urinary tract infections, or UTI, may occur for several reasons (see the box below). These include anatomic abnormalities of the urinary tract, improperly learned toileting behavior (dysfunctional voiding or urination), or the ascent of a virulent strain of bacteria into the bladder. Bacteria are normally present around the outside of the urethra and on the skin of the perineum around the anus. Occasionally they will ascend into the urethra and bladder to cause irritation, inflammation, or infection. Sometimes the bacteria simply inhabit the bladder and urethra and cause smelly urine or irritated voiding (frequency of voiding without pain or burning or fever). Other times the presence of bacteria will cause severe pain and burning and irritated voiding with urgency (the feeling of needing to go often) and frequency (voiding often). Occasionally bacteria can ascend to the ureters (tubes connecting the kidney and bladder) and kidneys, and cause an infection of the kidneys known as pyelonephritis.

Causes of UTI

Anatomic Abnormalities

- A. Obstruction (hydronephrosis)
 - At the kidney level [ureteropelvic junction (UPJ) obstruction]
 - Where the ureter enters the bladder (ureterovesical junction obstruction, ureterocele, or megaureter)
 - In the urethra (urethral stricture or valves – found only in boys)
- B. Vesicoureteral reflux (backwash of urine from the bladder to the ureter and kidney)
- C. Neurological problems with brain, spinal cord, bladder and sphincter muscles

Dysfunctional elimination

- A. Chronic urinary holding with daytime wetting accidents
- B. Chronic constipation with or without bowel accidents
- C. Urine urgency and frequent voiding

(see next page)



What are the signs and symptoms of UTI?

These will depend on the child's age and the location of the infection. They may include some or all of the following:

- Infants
 - Fever
 - Irritable
 - Difficult to console
 - Vomiting
 - Poor feeding
 - Poor weight gain or weight loss
- Older children
 - Burning or pain with urination
 - Frequent and urgent urination
 - Fever
 - Lower abdominal pain
 - Side or back pain
 - New wetting episodes or more frequent occurrences
 - Blood in urine

Infections of the bladder and urethra usually do not cause fever. When an infection occurs in the kidney, however, there is usually a high fever and the child appears quite ill

Some practitioners believe that prolonged contact with dirty, soapy water may cause urethral irritation, which can lead to UTI. In fact, any urethral irritation, whether soapy water, sand in a bathing suit, or urethral manipulation (such as catheterization), can cause the child to alter his or her voiding habits and increase likelihood of infection. It usually occurs when the child delays or avoids voiding, which allows the bacteria time to multiply and infect the tissues. If your child complains of pain with voiding, it is very important to give them plenty of fluids and get them to void often. With girls, applying some anti-fungal ointment such as Monistat cream may alleviate uncomfortable symptoms. Children who suffer from constipation are also at risk for developing UTI.

How do you diagnose and treat a UTI?

If you or your doctor suspects a UTI, your child will need to give a urine sample at the lab or in the office. We will analyze the urine and then culture it to see if any bacteria grow.

If preliminary tests show the presence of an infection, we will treat according to the severity of the symptoms. If your child is sick and has a fever, the best method is to treat with intra-venous (IV) antibiotics. Occasionally, when children are so ill that they cannot keep food down, they may require admission to the hospital for IV fluids and antibiotics.

In other cases, treatment is usually as an outpatient and the child will be given a course of antibiotics for five to seven days. If there is fever with the infection, the doctor may choose to give IV antibiotics until the fever goes away. With fever, your child will need to remain on a low-dose of antibiotic once a day until tests are done to rule out the presence of an anatomic deformity of the urinary tract

What about evaluation and follow-up?

Children who have had a culture-proven UTI should undergo a thorough evaluation once they are feeling better. Tests may include one or more of the following:

- Repeat urine culture.
- X-ray of the abdomen to assess for constipation (performed in Imaging Department).
- Ultrasound of the kidneys and bladder (either in Imaging Department or the Pediatric Urology office)
- Voiding cysto-urethrogram (VCUG): done in Imaging Department to assess for reflux, bladder capacity and emptying ability. It requires placement of a urethral catheter. See handout entitled VCUG.
- Kidney scan: nuclear medicine exam performed in the Imaging Department to assess for kidney scarring or severe obstruction. Requires an IV and possibly a urethral catheter.
- Urodynamic study to assess if there is neurological impairment of the bladder. This is most often done for children with spinal cord problems or severe behavioral dysfunction of the bladder. See handout entitled Urodynamics.

(see next page)

After your child completes the tests, you should make an appointment with the pediatric urologist to review all results and to have your child begin an appropriate treatment program.

To make an appointment, please call Kapi'olani's Pediatric Urology Office at (808) 983-6210.