



Pediatric UTIs and Catheterization in Children with Neurogenic Bladder and Bowel

February 2022

Questions about Pediatric Urinary Tract Infections and Catheterization in Children with Neurogenic Bladder and Bowel

1. *Why is it important to begin urologic care (care of the kidneys, ureters, bladder, and urethra) during infancy and continue throughout life?*

There are two main reasons to begin urologic care:

- **To protect the kidneys from damage**
 - By preventing urinary tract infections (UTIs)
 - By identifying and treating vesicoureteral reflux (VUR)
 - Keeping bladder pressures low
- **To help prevent bladder and bowel accidents**

2. *How do I know my child has a urinary tract infection (UTI)?*

Children with Spina Bifida may be able to communicate their symptoms but may not be able to sense pain on urination or be able to identify (localize) where discomfort is coming from. Therefore, complaints may be vague, and the child may generally not feel well.

All children will eventually have bacteria that live in their bladder, but it is when these bacteria cause symptoms that they are problematic. It is important to recognize symptoms of UTI in infants because they cannot complain when they become ill. Sometimes a fever may be the only obvious symptom. A high fever may mean there is a kidney infection, which is more serious than a bladder infection.

Symptoms of a UTI include:

- Recorded temperature of fever (≥ 100.4 F or 38.0°C)
- Excessive fussiness or sleepiness
- Decreased activity
- Change in odor or appearance of urine (bloody, cloudy)
- *A continent child may have urinary accidents*
- *Decreased appetite*
- *Nausea and vomiting*
- *Lower back or lower belly pain*
- *Pain with urination or cathing*



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Aside from these symptoms, there are tests to confirm whether a UTI is present.

Aside from having a recorded temperature or fever of ≥ 100.4 F (38.0 °C), other tests to confirm a UTI include:

- **Positive urinalysis (UA)** is defined by positive nitrites and leukocyte esterase on a urine dipstick and/or seeing several white blood cells in the urine sample.
- **Positive urine culture (UC)** from a catheterized urine specimen is defined by significant bacterial growth in the sample. Urine cultures also help to identify the specific type of bacteria causing the infection and determine the most appropriate antibiotic therapy.
- $>50,000$ colony forming units (CFUs)/ml in a sterile sample from catheterization
- $>100,000$ CFUs/ml in a clean voided specimen

***Please note:** if a child has a fever (or ≥ 2 UTI symptoms) and a positive UA, they may be started on antibiotics before the urine culture results are back due to high suspicion of them being sick. If a child is experiencing changes in their urination with a positive UA, but does not have any other UTI symptoms, clinical providers may wait for the urine culture results before starting any treatments.

3. **How are urinary tract infections (UTIs) prevented?**

There are several ways to prevent UTIs:

- **Stay hydrated.** Drink plenty of water to produce more diluted urine and flush bacteria out of the urinary tract.
- **Avoid urinary retention.** Urinary retention occurs when urine sits in the bladder for long periods of time, and the bladder is not adequately emptied. To manage this problem, clean intermittent catheterization (CIC) is necessary to empty the bladder, usually several times each day. Because bladder infections can be problematic, a new catheter is recommended for each catheterization.
- **Bowel Management.** Ensure soft stools every day to prevent constipation. Constipation causes excessive stool in the rectum which leads to increased bacteria on the perineum (area between the anus and urethra). Increased bacteria near the urethra can cause infection. Constipation can also make it more difficult to completely empty the bladder.
- **Routine renal ultrasounds.** Ultrasounds of the kidneys help to evaluate for any kidney stones or hydronephrosis, swelling of the kidneys and ureters. Stones and hydronephrosis can damage the kidneys and increase the risk of infection.
- **Routine follow up with urology for VCUG and urodynamic studies.** Urologists are doctors who specialize in the organs of the urinary and reproductive systems. They may order tests, like a voiding cystourethrogram (VCUG) or urodynamic studies, to help understand how well the bladder, sphincters, and urethra are storing and releasing urine. They can also determine if there is any reflux of urine. More details on reflux and how a VCUG is performed can be found below.



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- **Irrigating bladder, if post augmentation.** If a child has undergone surgery to increase the size of their bladder, regularly irrigating, or flushing, the bladder with sterile water or normal saline can help prevent UTIs. This helps to prevent urine from staying in one place for too long, which may cause infection.

4. **How are urinary tract infections (UTIs) treated?**

UTIs are treated with a course of antibiotics. It is important to maintain adequate hydration and adhere to the preventative practices outlined above (avoiding urinary retention and constipation) to allow the infection to resolve.

5. **What is vesicoureteral reflux (VUR)?**

Vesicoureteral reflux (VUR) means that urine moves upward from the bladder back into the kidneys. Normally, the ureters (tubes that transport urine from kidneys to bladder) work as a one-way valve, preventing urine from traveling from the bladder to the kidneys. In VUR, urine goes both ways. When there are bacteria in the urine, it can cause kidney infections, which in turn can damage the kidneys. Although bladder infections are a nuisance, kidney infections are dangerous, because the kidneys may be permanently damaged.

6. **How do I know if my child has vesicoureteral reflux (VUR)?**

Vesicoureteral reflux (VUR) is diagnosed through a test called a voiding cystourethrogram (VCUG). Typically, a VCUG is performed at birth to screen for reflux. It may be repeated if the child has a UTI with fever, or if there is swelling or hydronephrosis, urine build-up inside the kidneys. Hydronephrosis is diagnosed with ultrasounds, which are also performed at birth and regularly thereafter.

7. **How is a voiding cystourethrogram (VCUG) performed?**

To perform a VCUG, a catheter is placed into the bladder. A dye that can be seen on X-rays is instilled into the bladder through the catheter. X-ray images are obtained during filling and urination. A healthy bladder appears smooth. A neurogenic bladder often has outpouchings called diverticula.

Although neurogenic bladder and bowel cannot be cured, a lifetime of regular urologic care and careful management, through catheterization and bowel management, will protect kidneys and ensure a healthier life.

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This information does not constitute medical advice for any individual. As specific cases may vary from the general information presented here, SBA advises readers to consult a qualified medical or other professional on an individual basis.