

Understanding the Urinary System

The kidneys filter waste products from the blood, forming urine. Urine flows through the ureters into the bladder. As the bladder is filling, the bladder muscles relax and the sphincter (pronounced sfink-ter) muscles stay tight (contract) to hold the urine in the bladder. When the bladder is full, it sends messages through the nerves of the spinal cord to the brain signaling the body to release the urine. The brain responds by sending messages back through the nerves of the spinal cord to the bladder. These messages signal the bladder muscles to tighten (contract) and the urethral sphincter muscles relax, opening the sphincter. Then urine flows out of the bladder.

How Does Spina Bifida Affect the Urinary System

Almost all children with spina bifida will have problems with their bladder function. Bladder function is controlled by the nerves at the bottom of the spinal cord and nerve damage may interrupt the messages from the brain to any part of the urinary system. Normal urination may not occur because nerve damage may limit bladder and sphincter muscle function and reduce sensation. The following two types of bladder function problems may result and change over time:

Small spastic bladder:

- Results from uncontrolled contractions (tightenings) of the bladder muscles
- May lead to back up of urine to the kidneys (reflux), enlarged kidneys (hydronephrosis) (pronounced hydro-nef-ro-sis) and wetness
- Bladder becomes unusually small and holds little urine
- Large flaccid bladder:
- Results from inability of the bladder muscles to contract properly
- May lead to frequent infections caused by poor emptying
- Bladder becomes unusually large with a relaxed sphincter

Managing the Urinary System

It is important to help your child protect his/her kidneys and bladder by doing the following:

- Talk to your spina bifida health team about toileting routines tailored to your child's needs.
- Clean Intermittent Catheterization (CIC) is a procedure whereby a clean catheter (tube) is inserted through the urethra into the bladder and removed after the bladder is empty. CIC is done every 3-4 hours during the day to empty the bladder regularly in order to prevent reflux and hydronephrosis.
- Medications (known as anticholinergics) may be prescribed to relax bladder contractions.
- Regular monitoring of bladder and kidneys is required (e.g. renal ultrasounds, voiding cystourethrogram (VCUG), urodynamic testing, renal scan).
- Occasionally, surgery may be required.

Preventing and/or Reducing Bladder Infections

Below are suggestions for maintaining bladder health:

- Regular emptying of the bladder through catheterization is important to reduce the length of time the urine is held in the bladder to help prevent infections
- Extra water intake is encouraged (speak to your health care professional in the spina bifida service about the appropriate volume)
- Daily antibiotics may be prescribed
- Bladder irrigation may be recommended

Preventing and/or Reducing Incontinence/Wetness

Strategies listed above will help reduce incontinence. Urological surgery (e.g. sphincter tightening and bladder augmentation) may be recommended to improve the ability of the bladder to hold urine between catheterizations.

Urological Testing

The following urological tests may be ordered by a physician to examine your child's bladder function.

Renal (Kidney) Ultrasound (U/S)

- Shows the size and shape of the kidneys and is used to check for hydronephrosis and kidney growth.

Voiding Cystourethrogram (VCUG)

- X-ray taken after a special dye is instilled into the bladder through a catheter.
- Shows the shape, size and general appearance of the bladder and is used to check for reflux.

Urodynamics (UDS)

- Pressure test of the bladder taken after water is instilled into the bladder through a catheter.
- Shows how the bladder fills, holds and empties urine as well as measures the urethral sphincter muscle tone which helps in determining urinary continence potential.
- A small catheter is also placed in the rectum to measure rectal tone.
- This test is most accurate when the bowel is empty and there is no bladder infection.

Renal Scan

- X-ray scan of the kidneys taken after a special dye is injected into the arm or leg through a tiny needle.
- Shows how well the kidneys are functioning.

Cystoscopy

- A scope that is inserted into the urethra, which allows a look at the inside of the bladder and the urethra using a thin, lighted instrument. Instruments can also be used to remove tissue samples and collect urine. Small bladder stones and some small growths can be removed using this scope. This procedure can also be used to find the cause of symptoms such as blood in urine, painful urination, urinary incontinence, urinary tract infections, and blockages like kidney stones.

Symptoms of Urinary Tract Infections (UTIs)

Children with spina bifida may develop symptoms of urinary tract infections. UTIs can be life threatening if left untreated. Symptoms and signs may include:

- Fever
- Abnormal wetting
- Irritability
- Cloudy, smelly urine
- Mid-back pain or pain during urination
- Blood-tinged urine

Most individuals living with spina bifida will require catheterizations for their entire life. However, with proper instruction and support many children will learn to do the procedure by themselves and as part of their daily routine. Some children may begin to catheterize themselves as early as kindergarten. Parents are encouraged to provide their child with opportunities to practice the procedure as often as possible. Practicing on a doll can be a great teaching aid. Ask your spina bifida clinic about specialized instructions and supports that are available to help with practice.

Hydrocephalus Canada

We are the voice of
Canadians living with hydrocephalus and spina bifida.

Every day we strive to empower those impacted by both conditions to experience the best life possible.

We do this by establishing environments that protect, support and enhance the lives of those living with, or at risk of developing, these conditions.

Our work focuses on four areas of influence – Education, Support, Awareness and Research.



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