Vesicoureteral Reflux

General Information
The normal urinary system is made up of two kidneys, two ureters, the bladder and a urethra. The kidneys are the bean shaped structures located just below the ribcage that make urine (the body’s waste fluid). The ureters are the tubes that carry the urine from the kidneys to the bladder. The bladder is an elastic muscle that acts as a storage tank and holds the urine. The urethra is the tube that carries urine from the bladder to the outside. The bladder and the urethra join and are surrounded by a muscle called a sphincter that squeezes to hold urine in or relaxes to allow urine to flow out. When the bladder gets full, it sends a message to the brain. The brain decides when urination should start and signals the sphincter to relax and the bladder to contract, allowing the bladder to squeeze all of the urine out.

![Normal Urinary System](image1)

What is REFLUX?
In most children, urine goes only one way – from the kidney to the bladder and to the outside. For some children, urine flows back or “refluxes” into the kidney. Reflux is graded on a scale of one through five with one being the mildest and five the most severe. Reflux can be one-sided, (unilateral) or two sided, (bilateral). Reflux is a condition that people are born with and tends to run in families. Siblings will have a 25-30 % chance of having reflux. Your doctor may suggest that siblings are checked for this condition as well.

Is REFLUX dangerous?
Many people have reflux and are not aware that they have it. Reflux itself is not dangerous; however, when there is infection in the bladder (UTI or urinary tract infection) bacteria can travel back up to the kidney and cause a more severe form of infection called pyelonephritis (kidney infection). With this infection, your child will likely experience nausea, vomiting, fever and pain. Reflux does not cause bladder infections, however if the bladder infection occurs, it is easier for bacteria to enter the kidneys. Most importantly this type of infection puts your child at risk for developing scars on the kidney that can impair function and lead to high blood pressure (hypertension).

See back for more information.
How is REFUX diagnosed?
Reflex is diagnosed or detected by a special X-ray called a voiding cystogram (VCUG). During this test a small catheter is placed through the urethra and contrast fluid (dye) is placed in the bladder. As the bladder fills pictures are taken of the bladder, ureters and kidneys. If this fluid flows backward into the kidney during filling or voiding, your child has reflex. Your child may experience some discomfort during the placement of the catheter. He or she will be asked to void or urinate during the procedure to detect the reflex. It is for this reason that sedation options if given, are very short acting and help ease the catheter placement and allow your child to be awake enough to be able to co-ordinate urinating. This test is performed in Radiology department. (See VCUG handout for more details).

Another test that your doctor may order is called a renal/bladder ultrasound utilizing ultrasound waves. No radiation is used. This is a painless test where “jelly” is placed on the tummy and back and pictures are taken of the bladder and kidneys. This test will demonstrate the size of the kidneys and bladder muscle and will help to identify gross scarring in the kidneys but it does not detect reflex.

A DMSA kidney scan may be recommended when there is greater concern for scarring as when your child has had repeated infections or if the ultrasound is abnormal or suggests some scarring defects or poor growth of the kidneys. This test gives an assessment of kidney function and scarring. It requires an IV and takes about 4 hrs.

How is REFUX managed?
The plan of treatment for reflex may vary based on your child’s age, the degree of reflex, and the number and severity of urinary tract infections. Medical management involves careful observation and testing over time. Your child’s doctor may recommend placing your child on a low dose daily antibiotic to protect the kidneys from infection. Your doctor may also suggest other ways to help reduce the risk for infection. These include treating any abnormal urinating habits and treatment of constipation, adding yogurt and cranberry juice or cranberry supplement to their diet and keeping your child well hydrated.

Follow-Up
Most children will outgrow mild to moderate reflex over time but will need monitoring to evaluate the need for continued antibiotics. If your child has a UTI your pediatrician can treat the infection, but you should contact our office so we can note that in the chart. Be sure to have your child’s urine tested with any unexplained febrile illness. Your child’s doctor may recommend a renal ultrasound every six months to one year and a yearly VCUG. If your child has not outgrown the reflex by about age 5-6 years, your doctor will discuss further recommendations. If your child has repeated infections while on the daily antibiotics, he or she may be “failing medical management”, your doctor may recommend surgery to correct the reflex.

Surgical Management of vesicoureteral reflux can be treated with a subureteric injection procedure or with an operation called “ureteral reimplantation”. The concept, with both procedures is to change the connection between the ureter at the level of the bladder to prevent urine from refluxing up the kidney. Each surgical option has the risk of infection, bleeding, urine retention, residual reflex, new reflex on the other side and obstruction of the kidney. The risk of residual reflex varies with the approach used and will be discussed with you if surgery is indicated.

For questions or concerns, please contact the Urology office at (205) 939-9840.

For emergencies and after hours, call the University of Virginia Hospital operator at (434) 924-0000 and ask to have the on-call urologist paged.