Pediatric Surgical Associates, Ltd.

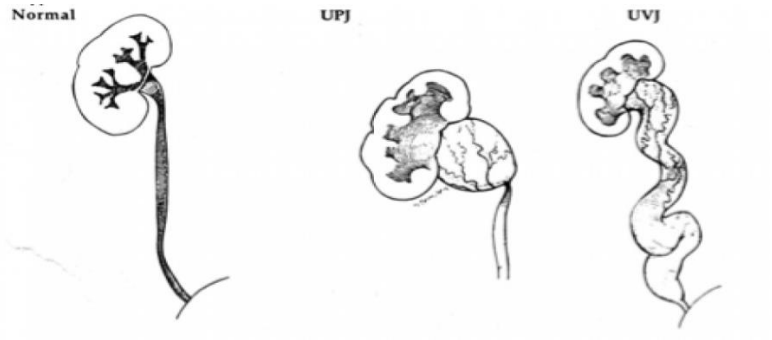
Patient and Family Education

Hydronephrosis

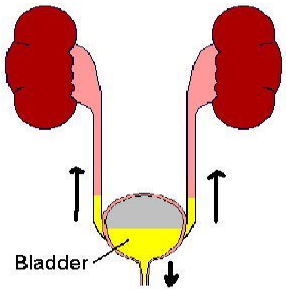
What is Hydronephrosis?

Hydronephrosis is a dilation of the kidney, specifically in the renal pelvis or the place in the kidney where urine is stored after its production. It occurs in 1-2% of all pregnancies. This extra fluid can be the result of some type of abnormality in or below the kidney or it **may be a variant of normal**. Hydronephrosis can be caused by many factors. Some of the most common reasons include obstruction or urinary reflux. Obstruction of the kidneys can occur at the level of the kidney (uretero-pelvic junction obstruction or UPJ) or at the level of the bladder (uretero-vesical junction or UPV). It can also include a megaureter. Urinary reflux is the abnormal back flow of urine from the bladder back towards the kidneys.

Obstruction:



Reflux:



How is hydronephrosis diagnosed?

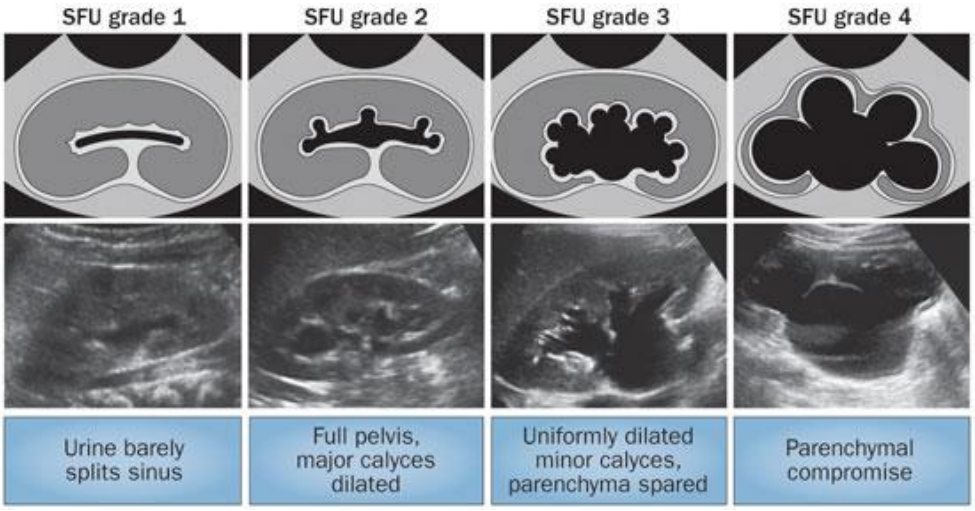
Hydronephrosis is usually diagnosed in one of two ways.

1. A prenatal ultrasound (ultrasound during pregnancy). This may reveal that the unborn baby has dilated or enlarged kidneys. This occurs in about 1 out of 100 pregnancies.
2. An ultrasound done after the baby is born. This sometimes is found after a routine evaluation for another medical problem or concern such as urinary tract infection or incontinence.

Once hydronephrosis is noted, additional tests may be needed in order to find out why there is extra fluid in the kidneys. Early diagnosis and treatment of such an abnormality can prevent future urinary tract infections and permanent kidney damage or scarring.

How is hydronephrosis graded and why it this important?

Hydronephrosis is graded on a scale ranging from 1-4, with one being the mildest form and four being the most severe. See the image below:



The degree of hydronephrosis is used to help decide how to evaluate and treat each patient. The more severe the grade of hydronephrosis, the more testing will be required along with closer pediatric urology care and follow-up.

Why does hydronephrosis occur?

There are numerous reasons why hydronephrosis occurs. The list is quite extensive but most often the cause of hydronephrosis is from one of the first three (in bold) diagnosis:

1. **Vesicoureteral reflux**
2. **Ureteropelvic junction (UPJ) obstruction**
3. **Non-obstructive, non-refluxing hydronephrosis**
4. Ureterovesical junction (UVJ) obstruction
5. Megaureter
6. Ureterocele

7. Posterior urethral valves
8. Multicystic dysplastic kidney
9. Ectopic ureter
10. Neurogenic/non-neurogenic bladder

What other test should be done after the baby is born?

RUS (renal ultrasound). This is a noninvasive exam that produces images, which are used to assess the size, shape and location of the kidneys. It also look at the size and shape of the bladder.

VCUG (voiding cystourethrogram). This study gives us important information regarding the size and shape of the bladder, bladder neck (bladder opening), urethra (tube that drains urine from the bladder outside of the body) and the ureters (tubes that drain the kidneys into the bladder). It helps us ensure that there is no blockage present in the lower urinary tract and helps diagnose vesicoureteral reflux.

Renal (Kidney) Scan. This test may be needed due to the severity of hydronephrosis. It is also done for children who have a history of getting multiple urinary tract infections. This test helps us look at the function and drainage of the kidneys. A renal scan will show if there is kidney damage and/or scarring which may have been caused by long-standing hydronephrosis or from a previous urinary tract infection. There are two types of renal scans that can be performed and this is determined by diagnosis.

When should these tests be performed if a prenatal ultrasound shows hydronephrosis?

If your newborn baby has hydronephrosis (kidney, ureter or bladder dilation) noted on a prenatal ultrasound, an initial postnatal ultrasound is often done before leaving the hospital. It is optimally performed after 48 hours in order to minimize the risk of a false negative study due to dehydration. Your urologist may prefer for you to obtain an ultrasound at your one week well child check instead. Depending on the results of the repeat renal ultrasound, a **VCUG** and **Renal Scan** may be performed. The timing of these studies will depend on the severity of the problem and may range from needing to be done immediately, to when your baby is 3 months of age, to never.

Will my child require any medication to assist in treating hydronephrosis?

After your baby is born we may recommend that he/she be placed on a low dose, daily antibiotic. The goal of this daily antibiotic therapy is to prevent kidney infections that may occur as a result of the hydronephrosis. These antibiotics are very specific for the urinary tract and have very few, if any, side effects. Once all x-ray testing has been completed, we will be able to estimate the total time of needed antibiotic treatment.

We may also recommend circumcision at birth for boys to reduce the risk of urinary tract infections.

Will the hydronephrosis go away or will my child require surgery?

Typically, non-obstructive hydronephrosis is self-limited. We observe for resolution within the first year of life. Sometimes if hydronephrosis is associated with urinary tract infections or seems to be worsening, we will recommend surgical repair such as ureteropelvic junction (UPJ) repair for obstruction or a ureteral reimplant for vesicoureteral reflux. We will discuss these options with you as needed.