



Hydronephrosis

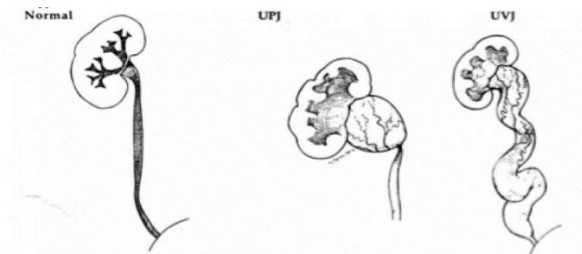
What is Hydronephrosis?

Hydronephrosis is swelling of the kidney(s) due to the buildup of urine. This extra fluid **may be a variant of normal** or can be the result of an abnormality in or below the kidney. There are several reasons hydronephrosis can occur. The most common reasons include obstruction or urinary reflux.

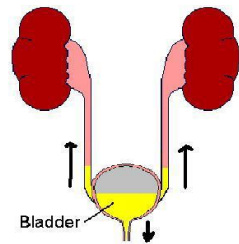
Obstruction of the kidney(s) can occur at the level of the kidney (uretero-pelvic junction obstruction or UPJ) or at the level of the bladder (uretero-vesical junction or UVJ). It may also be caused by a ureter that is dilated but not obstructed.

Urinary reflux (vesicoureteral reflux) is when urine drains from the kidneys into the bladder but then flows back up 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.
2. An ultrasound done during a routine evaluation for another medical problem or concern such as urinary tract infection, urinary incontinence, or persistent vomiting.

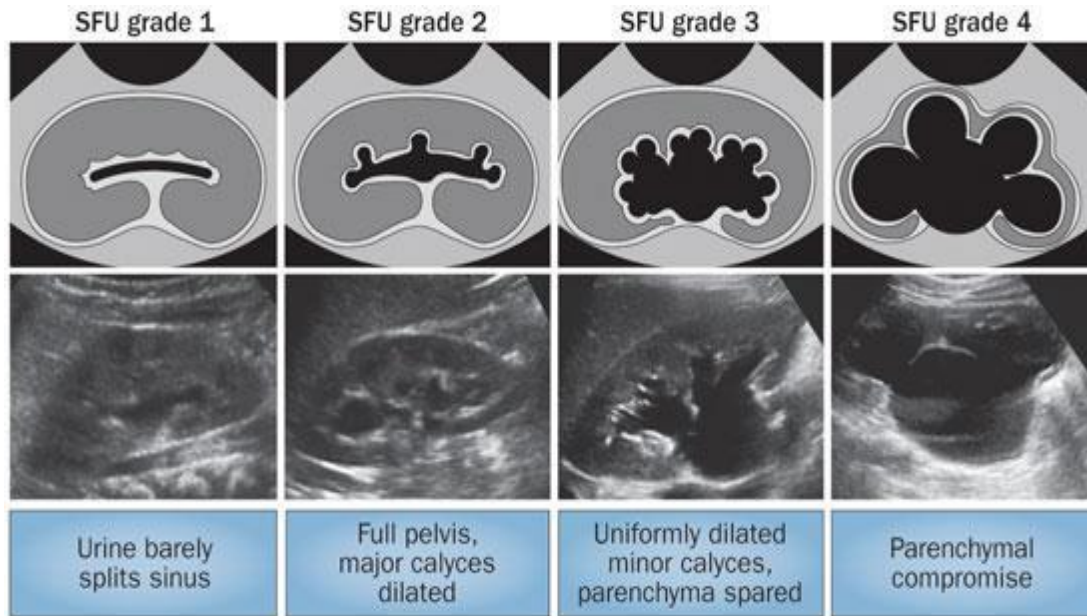
Once hydronephrosis is diagnosed, other tests may be needed to figure out why there is extra fluid in the kidney(s). Early diagnosis and treatment can help prevent future urinary tract infections and scarring or permanent damage to the kidney.



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How is hydronephrosis graded and why is this important?

Currently, there are several systems used to grade hydronephrosis. Some systems grade hydronephrosis using descriptive words such as mild, moderate, or severe, while others like the Society of Fetal Urology (SFU) measure the dilation of the renal (kidney) pelvis and grade the degree of dilation on a scale of 1-4, one being the mildest form and four being the most severe.



These different grading systems help decide the risk for complications related to hydronephrosis i.e., urinary tract infections and renal scarring and help decide **if** and **when** further testing or intervention is needed. The more severe the grade of hydronephrosis, the more testing will be needed along with closer urology care and follow-up.

Why does hydronephrosis occur?

There are several reasons why hydronephrosis occurs. The most common causes are one of the first three (in bold) diagnosis:

- 1. Vesicoureteral reflux**
- 2. Ureteropelvic junction (UPJ) obstruction**
- 3. non-obstructive, non-refluxing hydronephrosis**



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4. Ureterovesical junction (UVJ) obstruction
5. Megaureter
6. Ureterocele
7. Posterior urethral valves
8. Multicystic dysplastic kidney
9. Ectopic ureter (a ureter that does not connect to the bladder, and drains somewhere outside the bladder)
10. Neurogenic/non-neurogenic bladder

Other tests that may be recommended to evaluate hydronephrosis.

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 looks at the size and shape of the bladder.

VCUG (voiding cystourethrogram). This test requires a small tube (urinary catheter) to be placed in the bladder through the urethra (tube that drains urine from the bladder outside of the body). The bladder is filled with contrast material and images are taken that give us information on the size and shape of the bladder, bladder neck (bladder opening), urethra and the ureters (tubes that drain the kidneys into the bladder). It helps us diagnose if there is blockage present in the lower urinary tract or vesicoureteral reflux.

Renal (Kidney) Scan/Renogram. 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. It requires an IV to be placed in the hand or arm for contrast and may require a small catheter in the bladder. A renal scan assesses the function of the kidneys and how well each kidney is draining. A renal scan will show if there is kidney damage and/or scarring which may have been caused by long-standing hydronephrosis or from an earlier urinary tract infection(s).

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

If your newborn baby has hydronephrosis noted on a prenatal ultrasound, an ultrasound is often done just before leaving the hospital. It is ideally performed after 48 hours to minimize the risk of a false negative study due to dehydration. Your urologist may prefer to obtain an ultrasound at your one week well child check or 2-4 weeks after birth instead. Depending on the results of the repeat renal ultrasound, a VCUG and Renal Scan may be recommended.

The timing of these studies will depend on the severity of the hydronephrosis and may range from needing to be done as soon as possible, to when your baby is a little older, or never.



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Will my child require any treatment for hydronephrosis?

Based on the results of the renal ultrasound after your baby is born, we may recommend that your child be placed on a low dose, daily antibiotic. The goal of daily antibiotic therapy is to help prevent kidney infections. These antibiotics are specific to the urinary tract and have very few, if any, side effects. Once all radiology testing has been completed, we will be able to decide if antibiotic treatment is needed and for how long.

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 need 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.

It is important to monitor for signs and symptoms of a urinary tract infection; fever >100.5 F, unusual fussiness, or vomiting. If there are concerns for a urinary tract infection, have your child evaluated by their primary care provider or an emergency room with a urine culture **obtained by catheterization** and notify our office if positive.

If you have any questions or concerns, please call your child's provider at (612) 813-8000 or 1-800-992-6983.