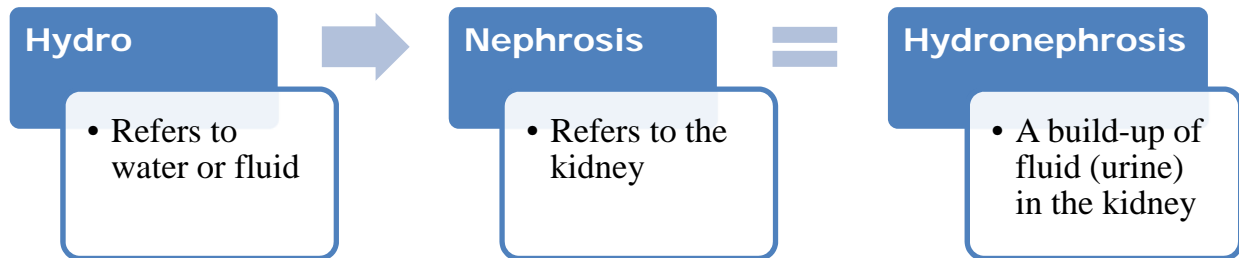


Hydronephrosis

What is hydronephrosis?



Hydronephrosis is the medical term for a build-up of urine in the kidney. As the urine builds up, it stretches or dilates the inside of the kidney, known as the collecting system.

If an unborn baby has hydronephrosis, an ultrasound scan will show a build-up of urine in the kidney. This is called “antenatal hydronephrosis”. Hydronephrosis is found in as many as 5 out of 100 pregnancies¹.

Hydronephrosis may also be found after birth. For example, if a baby has a urinary tract infection, an ultrasound of the baby’s kidneys and bladder may detect hydronephrosis.

Key points to remember if your baby has hydronephrosis

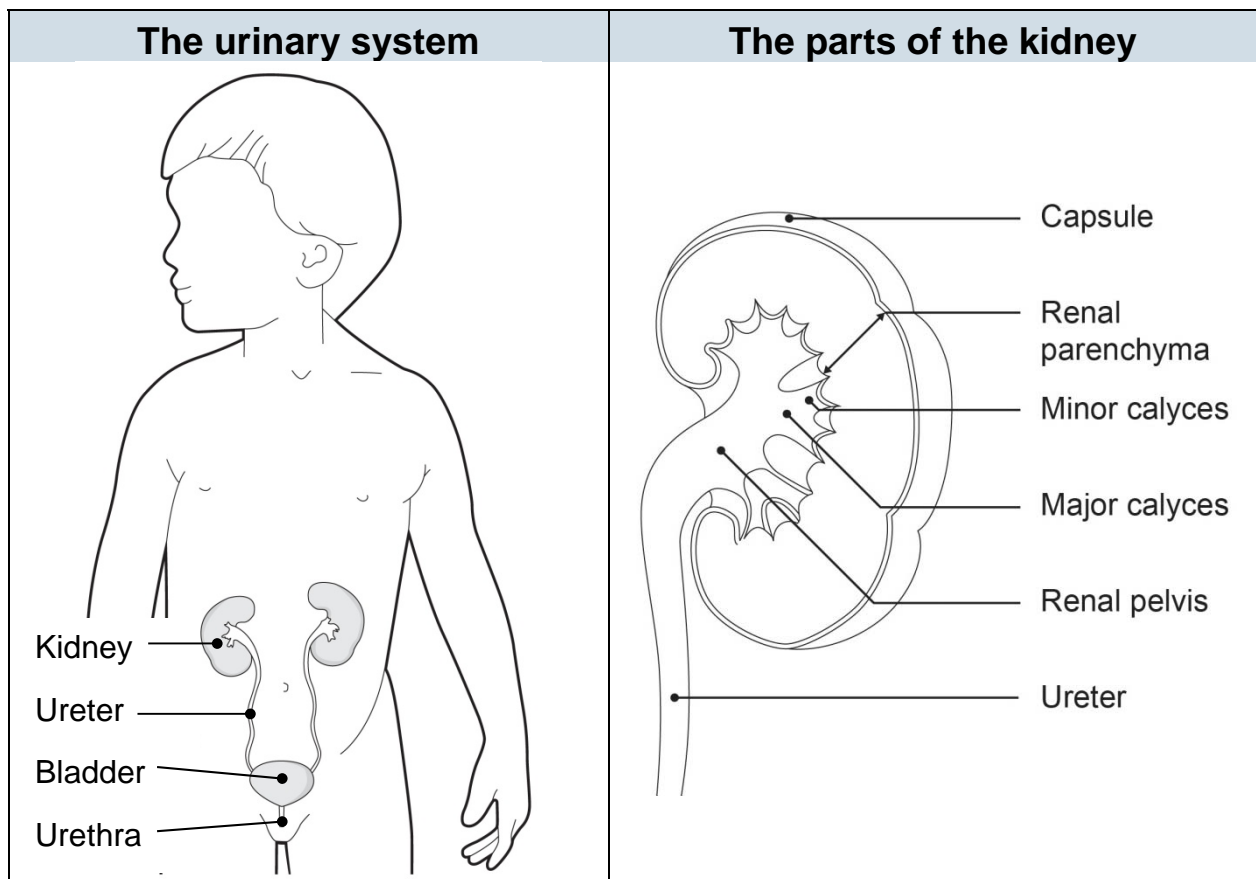
- Your baby can grow and develop normally with hydronephrosis.
 - Hydronephrosis may affect one kidney or both.
 - Hydronephrosis is a finding, not a disease.
 - Further tests are needed to find the cause of hydronephrosis.
 - If the cause is known, a Pediatric Urologist will discuss the possible treatment. Surgery is sometimes required to correct the cause of the hydronephrosis.
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How do the kidneys work?

To understand hydronephrosis, it is helpful to know about the urinary tract system. This is a group of body parts that work together to make, collect and pass urine. The urinary tract system includes the kidneys, ureters, bladder and urethra.

Here's how the system works:

- The tissue of the kidney (called the renal parenchyma) filters and removes waste from the blood, which makes urine.
- Urine moves into the collecting system. First into the calyces and then into the renal pelvis.
- Urine leaves the collecting system of the kidney and flows down to the bladder through a tube called the ureter.
- Urine is stored in the bladder.
- When the bladder empties, urine flows out through a tube called the urethra.
- The opening of the urethra is at the end the penis in boys and in front of the vagina in girls.



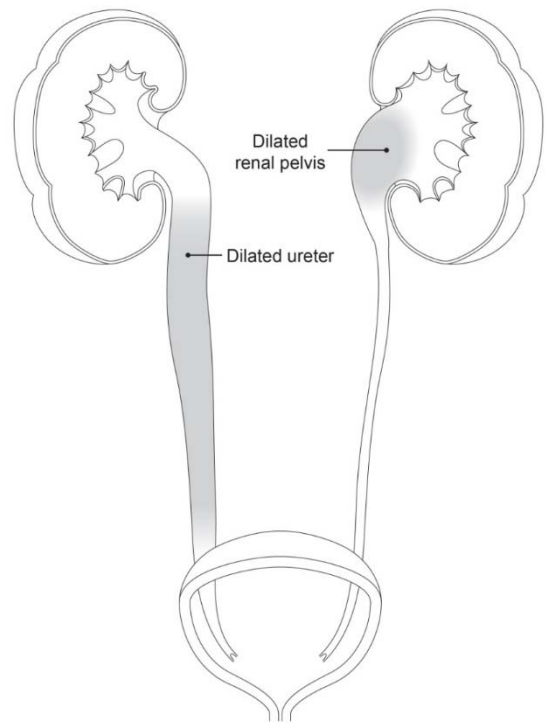
What causes hydronephrosis?

Hydronephrosis often occurs naturally (not due to illness or abnormality) and gets better with time.

The three most common known causes are:

Ureteropelvic Junction (UPJ) Obstruction

- Part of the urinary tract is narrowed or kinked. This can occur at the point where the ureter connects to the kidney, called the 'ureteropelvic junction'.
- Urine builds up in the collecting system and dilates the renal pelvis.



Ureterovesical Junction (UVJ) Obstruction

- Part of the urinary tract is narrowed or kinked. This can occur at the point where the ureter connects to the bladder, called the 'ureterovesical junction'.
- Urine builds up in the ureter and collecting system. The ureter becomes dilated, this type of ureter dilatation is called a megaureter.

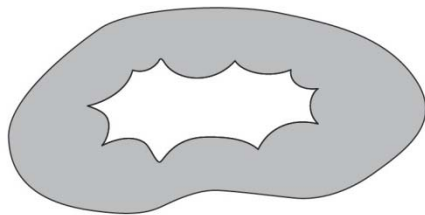
Vesicoureteral Reflux (VUR)

- Urine flows backward, from the bladder back up into the ureters and sometimes all the way to the kidneys.
- The ureters may become dilated.

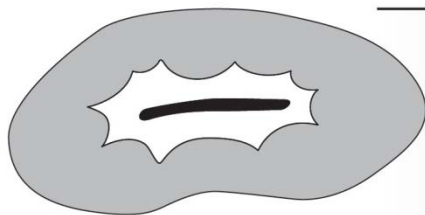
Less common causes of hydronephrosis include ureterocele, posterior urethral valves and kidney stones. If your baby's ultrasound shows signs of these problems, you will be given information about the condition and how it may be treated.

How is hydronephrosis assessed?

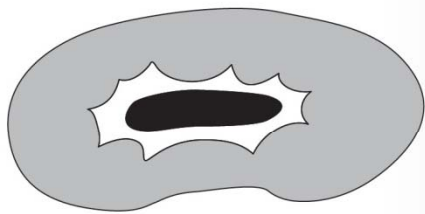
Hydronephrosis is graded on a scale of 1 to 4 (from mild to severe). The grade is helpful in deciding the plan of care for your baby.



Grade 0



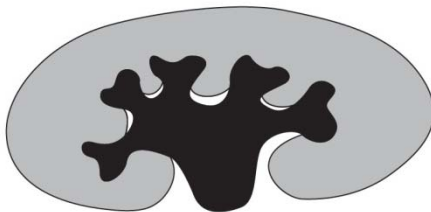
Grade I



Grade II

Mild hydronephrosis

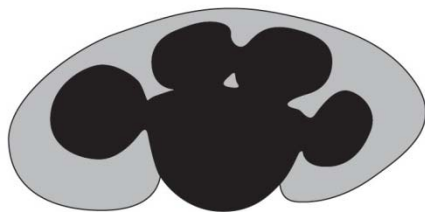
In grades 1 and 2, there is a small build-up of urine in the renal pelvis.



Grade III

Moderate hydronephrosis

In grade 3 there is a build-up of urine in the renal pelvis and calyces.



Grade IV

Severe hydronephrosis

In grade 4 there is a build-up of urine in the renal pelvis and calyces. The renal parenchyma (where urine is made) is thin.

What care and tests are needed?

Your baby will be referred to a Pediatric Urology Team. As part of your baby's care:

- your baby will be examined
- further tests will be recommended to find out more about your baby's condition and check how the kidneys are working
- the team will help you understand hydronephrosis and answer your questions

Tests your baby may need	
Ultrasounds	Regular ultrasounds are done to check your baby's kidneys and bladder, and to see how the hydronephrosis changes with time and/or treatment.
Voiding cystourethrogram (VCUG)	<p>A test to check the flow of urine to see if there is any reflux.</p> <ul style="list-style-type: none"> • A thin, plastic tube called a catheter is put into your baby's bladder through the urethra. • A special dye is put into the bladder through the catheter. • X-ray pictures are taken as the bladder fills and as your baby passes urine. Then the catheter is removed.
MAG3 or Renal scan with Lasix	<p>A test to check how well the kidneys are working, and how well urine drains from the kidneys into the bladder.</p> <ul style="list-style-type: none"> • Your baby is given a medication (radioactive isotope) through an intravenous (IV) line. • X-ray pictures are taken as the medication is taken up by the kidney, then passed out in the urine.

What is the treatment for hydronephrosis?

Your baby may need to take a low dose antibiotic to prevent urinary tract infections. Antibiotics can be prescribed if your baby has had urinary tract infections, has vesicoureteral reflux or severe hydronephrosis. Often there is no other treatment other than close monitoring with regular ultrasounds.

Hydronephrosis often gets better with time, without any treatment.

Up to 25% of children with hydronephrosis will require surgery.

If a cause for the hydronephrosis is found, your baby may need surgery, such as:

- Pyeloplasty - surgery to correct UPJ obstruction.
- Ureteral re-implantation - surgery to correct vesicoureteral reflux or ureterovesical junction obstruction (megaureter).

Babies with severe hydronephrosis may need surgery to create another pathway for urine to drain effectively from the kidneys.

What are the long-term effects of hydronephrosis?

With early detection and treatment if needed, the outlook for most babies with hydronephrosis is very good. The goal of treatment is to make sure that urine drains effectively from the kidneys. This lets the kidneys make urine properly and prevents urinary tract infections.

If hydronephrosis is severe or left untreated, it could lead to repeated infections and/or kidney damage.

If you have any questions about hydronephrosis or your baby's health, please talk with your doctor or nurse practitioner.

McMaster Children's Hospital – Pediatric Urology Team

Dr. Luis Braga

Dr. Jorge DeMaria

Nurse Practitioner: Natasha Brownrigg

Reference ¹

Nguyen, HT et al. (2010). The Society for Fetal Urology consensus statement on the evaluation and management of antenatal hydronephrosis. *Journal of Pediatric Urology*. 6(3): 212-231.

If you wish to read this reference, please ask a health care provider for a copy.

Notes

