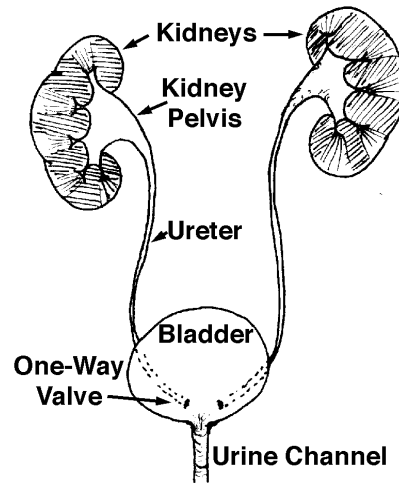


Information for Parents About Hydronephrosis

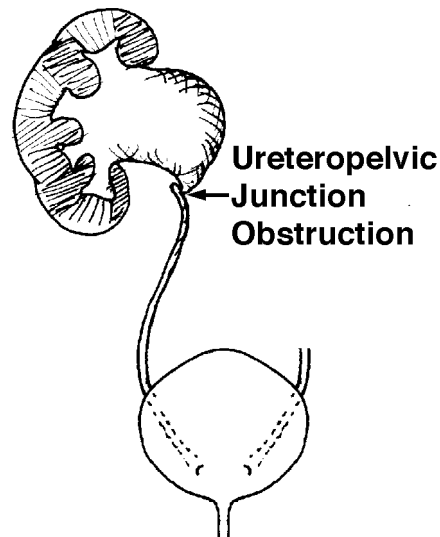
Hydronephrosis literally means water inside the kidney. It is usually used to describe a kidney with more than the usual amount of urine inside. In the normal urinary system, two kidneys filter the blood to produce urine which drains through a funnel system within the kidney called the **pelvis**. Urine then drains into the **ureter** (you-re-ter), the tube which connects the kidney to the **bladder**. A one-way valve at the bottom of the ureter allows urine to pass into the bladder, but blocks any urine from going backwards up the ureter to the kidney. The bladder stores urine until it is drained through the **urine channel** outside the body.



What causes hydronephrosis?

Sometimes the funnel system of a kidney is enlarged, but it functions normally. In this case, medications or surgical treatment may not be necessary.

Hydronephrosis can also be caused by a blockage in the urine system. The most common site of blockage which causes hydronephrosis is the connection between the pelvis, the funnel system of the kidney, and the ureter (the tube which drains down to the bladder). This is called a **ureteropelvic junction obstruction** or **UPJ** for short.



The second most common place for a blockage to occur is where the ureter meets the bladder (the **ureterovesical junction or UVJ** for short). The blockage is usually only partial and it allows urine to drain through an enlarged ureter called a **megaureter**. However, the urine doesn't drain at a normal rate.

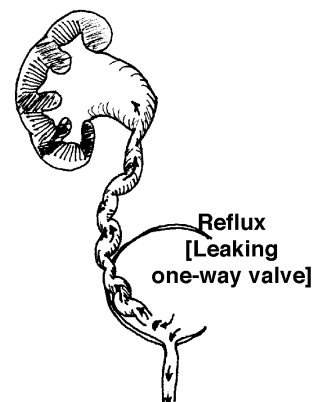
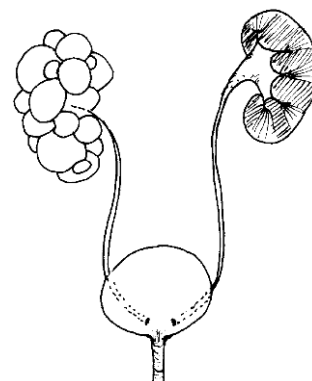
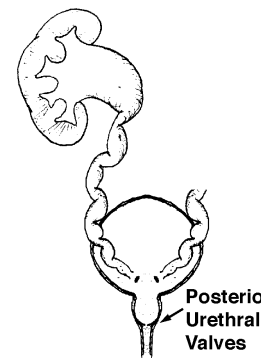
Children with either a ureteropelvic junction obstruction or a ureterovesical junction obstruction have a higher chance of having urine infections and kidney stones.

The third possible blockage occurs only in boys. Sometimes early in pregnancy, during development of the baby, small flaps of tissue can cause a narrowing of the urine channel just past the bladder. These flaps, called **posterior urethral valves**, make it difficult for the baby's bladder to empty. Sometimes the bladder muscle becomes thicker as it works harder and harder to empty the urine from the bladder. Eventually, this can cause urine to back up to the kidneys and cause hydronephrosis in one or both kidneys.

Hydronephrosis can also result when a kidney doesn't grow properly. Sometimes, very early in development, the ureter doesn't form a channel for urine flow. This results in large cysts forming where the kidney should grow. This is called a **multicystic kidney**. These kidneys almost never make urine after a baby is born and they usually shrink and disappear.

We usually just watch multicystic kidneys by getting an occasional ultrasound exam. Multicystic kidneys rarely need surgery.

Hydronephrosis is not always caused by a blockage. If the one-way valves at the bottom of each ureter don't work properly, urine can leak backwards from the bladder up to the kidneys when the bladder emptying muscle squeezes to drain the urine. This is called **reflux**.



What testing is necessary for children with hydronephrosis?

Many times, hydronephrosis is found in a developing baby when a woman has an **ultrasound** during her pregnancy. It's important to remember that ultrasounds of babies performed before birth are only about 80% accurate. For that reason the ultrasound is usually repeated. In some cases, repeating the ultrasound during pregnancy is the only test necessary.

During pregnancy, the liquid which cushions the baby inside the uterus (called **amniotic fluid**) is actually urine which comes from the baby's bladder. Very rarely, a serious blockage of urine drainage from the bladder occurs. This fluid is necessary for normal development of the baby's lungs because it provides a cushion around the baby's chest and it also helps to develop the lung tissue. If a baby's urine cannot pass through the urine channel out into the space within the uterus, the lungs cannot develop normally. In very rare and severe cases, the problem can make it impossible for a baby to survive after birth. Fortunately, this is rare.

In all babies with hydronephrosis, we use the ultrasound exam to see how much amniotic fluid is present around the baby. Even if both kidneys are enlarged, if there is normal fluid around the baby, treatment is rarely necessary before birth.

What can I expect after my baby's birth?

After your baby is born, we'll repeat the ultrasound while your baby is still in the hospital. In 1 baby out of 5, the ultrasound after birth is different from the ultrasound taken before birth. It may be necessary to repeat the ultrasound several days or weeks after the first one.

If hydronephrosis is seen on the ultrasound after birth, two other tests may be necessary. A **voiding cystourethrogram (VCUG)** is done by placing a catheter in the baby's urine channel and filling the bladder with liquid dye while taking x-rays. This test is necessary in order to tell whether reflux is present and whether the urine channel is normal. This test will usually be performed before your baby leaves the hospital.

Sometimes a **renal scan** is needed. This test is done by injecting fluid into a vein. The fluid is filtered by the kidneys and its passage through the kidneys and bladder can be watched on a nuclear medicine camera. We usually wait until the baby reaches at least 4 weeks of age to perform this test because the baby's kidneys are developing in important ways during this period of time. If the renal scan is obtained before four weeks of age, the results may not be accurate. The renal scan can tell us how well each kidney filters and drains.

Once the testing is completed, decisions and recommendations about treatment are made. Some children will need surgery to allow the kidneys to drain better and to relieve blockage or to stop reflux. In children who have very mild hydronephrosis, we usually recommend repeating an ultrasound every few months for the first 2 years. In other children with hydronephrosis, it may be difficult to tell whether the hydronephrosis is a result of blockage or simple enlargement. In this case, we may recommend repeated ultrasounds or renal scans. It's important to remember that each child is unique and there is no one single plan for evaluation and treatment that is right for all children.

When parents hear about abnormalities seen on ultrasound before the birth of their child, they can be anxious. Sometimes, it's easy to feel nervous about a problem if you don't understand it very well. Please ask questions. We are happy to give you the answers we have. You may think of questions at home before or after a clinic visit. Write those questions down so that you can ask them when you come to the clinic.

For more information on this topic you are welcome to visit Dr. Hatch's web site: Genitourinary Development [www.meddean.luc.edu/lumen/meded/urology/guhome.htm]

For more information about Dr. Hatch please visit our web site [www.luhs.org/urology]

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