HOW DOES THE URINARY SYSTEM WORK?

The urinary system is made up of the kidneys, the bladder and connecting tubes. The kidneys act as filters removing extra fluid and waste from your blood to make urine. Urine passes from the kidneys to your bladder through tubes called ureters. When the bladder is full, urine flows out of the body through a tube called the urethra.

The ureters enter the bladder and travel through its wall for a short distance. This creates a tunnel and ‘one direction only’ valve at the end of each ureter. These valves stop the urine travelling in the wrong direction.

HOW ARE KIDNEY PROBLEMS DETECTED IN UNBORN BABIES?

An ultrasound is used to examine unborn babies. Clear jelly is put over the mother’s belly and an instrument about the size of a small torch is passed over the skin. This instrument produces high frequency sound waves called ultrasounds, which bounce back from the baby as ‘echoes’, much like a radar gun. These echoes are processed to create an image of your baby and some internal organs. Newer ultrasound machines can produce a three or four dimensional image or video of the baby. These scans are limited from a medical viewpoint, but can be helpful to look at internal organs. It is important to be aware that not all kidney problems can be found by ultrasound.

Most pregnant women undergo an ultrasound examination between the 18th and 20th week of pregnancy. From about 18 weeks, it is often possible to find problems with a baby’s kidneys or bladder. About one baby in two hundred is found to have a problem.

ARE ALL KIDNEY PROBLEMS SERIOUS?

No. Most problems are minor. The most common finding is dilation or widening of the central kidney area where urine is collected. In about half of babies, it fixes itself before birth and in most of the rest, it gets better in the first year of life, without treatment.

Repeat ultrasounds might be done later in pregnancy to ensure minor problems return to normal. If the problem persists, the baby will have an ultrasound a few days after birth to decide if any further tests are needed.
**WHAT KIDNEY PROBLEMS MAY BE DETECTED?**

These are some examples of kidney problems found in babies:

- **Hydronephrosis**
  Hydronephrosis is the most common kidney problem in babies. It is a ‘stretching’ or widening of the inside or collecting part of the kidney. In most cases, it disappears during pregnancy or in the first year of life as the kidney grows. It may result from a narrowing in the ureter where it joins the kidney, preventing urine from draining freely into the bladder. It usually occurs only in one kidney.

- **Ureteric Reflux**
  Hydronephrosis may also be due to abnormal backwash or reflux of urine from the bladder if the ureteric valve is not working well. Reflux usually goes away as a child gets older. Reflux only seems to increase the risk of kidney damage when a child also has urine infections. Babies who have reflux but never have a urine infection are believed to be at low risk of kidney damage. This is an area of intensive research. See ‘Urinary reflux in children’ fact sheet for more information.

- **Multicystic Kidney**
  This is an uncommon condition, which affects only one kidney. The kidney tissue is completely replaced by large cysts. The affected kidney will not have any function, but the remaining kidney is usually normal.

- **Kidney Cysts**
  Different types of cysts can occur in the kidneys. Some types are inherited. Some types can interfere with kidney function even in childhood. See ‘Kidney cysts’ fact sheet for more information.

- **Posterior Urethral Valves**
  This problem causes a blockage in the urethra so the bladder becomes swollen. Investigation and surgery in the first days of life are needed. Posterior urethral valves is a very uncommon condition, which only occurs in boys. It can cause severe damage to both kidneys resulting in long-term health problems. When this condition is suspected, more frequent ultrasounds are needed to monitor the baby carefully.

- **Abnormal kidney development - Renal Dysplasia and Renal Agenesis**
  Sometimes an ultrasound shows kidneys that are small and abnormally formed. This is called renal dysplasia. Rarely, one or even both kidneys may be absent, a condition called renal agenesis. When only one kidney is present, it is usually healthy, so the condition does not cause problems. Occasionally, very poor kidney function requires intensive treatment or dialysis shortly after birth. In this case, a kidney transplant would usually be considered in the future.

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**CAN YOU FIND OUT HOW WELL A BABY’S KIDNEYS ARE WORKING BEFORE BIRTH?**

Yes – partly. The amount of amniotic fluid or the ‘waters’ around the baby, mostly made of baby’s urine, is the best indicator of baby’s kidney function. If there is the usual amount of amniotic fluid and the kidneys are of normal size and shape, then kidney function is probably normal. If both kidneys look abnormal but there is a normal amount of amniotic fluid, there is usually enough function to sustain life. If there is a serious shortage of amniotic fluid, kidney function is probably poor or absent. For these babies, lung function may also be affected because the fluid around the baby is important in lung development. These babies are usually very sick soon after birth. In serious cases, testing the amniotic fluid may give more information.
CAN PROBLEMS BE CORRECTED BEFORE BIRTH?

If the bladder is severely blocked and kidney function is getting worse, the pressure can sometimes be reduced by passing a tube into the unborn baby’s bladder. An instrument is passed through the mother’s belly into the space around the baby. This can give some relief until the baby can be born safely. These babies are usually born with abnormal kidneys and severely affected kidney function. This is another area of intensive research.

WHAT TESTS ARE USED AFTER THE BABY IS BORN?

Once the baby is born, a doctor will examine the baby and will run some tests. A number of tests can be used to examine the kidneys and urinary tract:

- An ultrasound during the first weeks of life
- A cystogram - a special X-ray of the bladder. A small tube or catheter is passed into the bladder through the urethra. The bladder is filled with a fluid that allows the bladder to show up in an X-ray
- A renal scan - used to examine the function of the kidneys. The scan uses small amounts of radioactive materials called isotopes. Isotopes are injected into a vein and later removed by the kidney. The isotopes are tracked as it passes through the kidney so that information about kidney function and any blockages can be obtained.

WHAT CAN I EXPECT IF MY CHILD HAS A URINARY TRACT ABNORMALITY?

Children with urinary tract abnormalities will need to have tests after birth to see if treatment is necessary. Some children may only need periodic visits to a doctor or may need to see a specialist. Sometimes antibiotics are needed or a small operation to fix the problem.

For more information about Kidney or Urinary health, please contact our free call Kidney Health Information Service (KHIS) on 1800 454 363. Alternatively, you may wish to email KHIS@kidney.org.au or visit our website www.kidney.org.au to access free health literature.

This is intended as a general introduction to this topic and is not meant to substitute for your doctor’s or Health Professional’s advice. All care is taken to ensure that the information is relevant to the reader and applicable to each state in Australia. It should be noted that Kidney Health Australia recognises that each person’s experience is individual and that variations do occur in treatment and management due to personal circumstances, the health professional and the state one lives in. Should you require further information always consult your doctor or health professional.

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If you have a hearing or speech impairment, contact the National Relay Service on 1800 555 677 or www.relayservice.com.au. For all types of services ask for 1800 454 363.