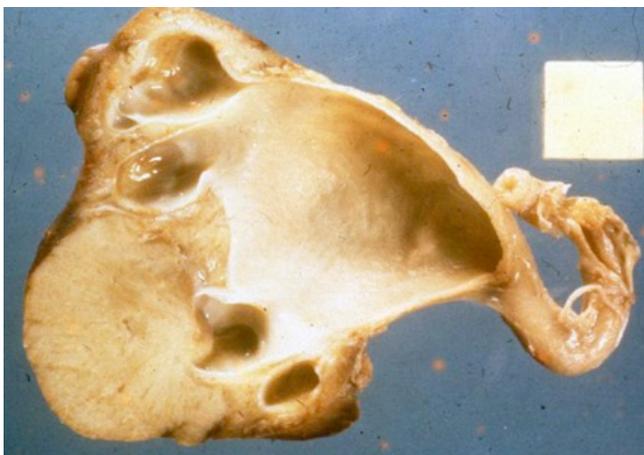


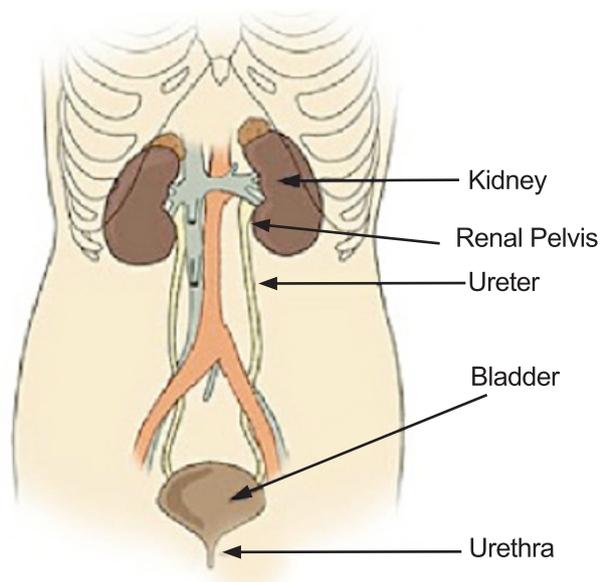
## What is vesicoureteric reflux?

The kidneys produce urine and this collects in an area called the renal pelvis and then goes down tubes called ureters to the bladder. These tubes are meant to be one way and there is a valve like feature between the ureter and the bladder to stop urine travelling the wrong way, back from the bladder into the ureter. When this mechanism doesn't work properly it leads to a condition called vesico (bladder) ureteric (ureter) reflux. It is sometimes called VUR or reflux for short. It has no symptoms, but it is sometimes found with urinary tract infections which do have symptoms.

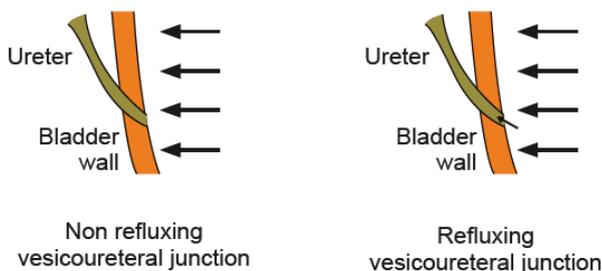


**Dysplastic or scarred kidney** with large renal pelvis and ureter compared with a normal kidney

## Parts of the Urinary System



## How does reflux occur?

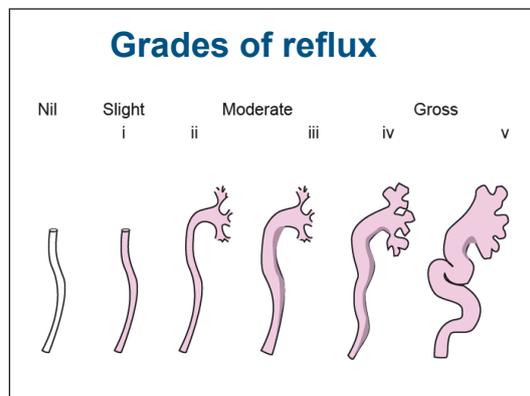


When the bladder contracts and empties the pressure on the inside of the bladder wall closes the lower end of the ureter (on the left) to close. Reflux is shown occurring (on the right) where the lower end of the ureter remains open during bladder emptying.

It can range from the very mild causing a small increase in the size of the ureter, to severe where urine travels back up to the kidney making the collecting area swell and the kidney very dilated. You may hear it referred to as mild, moderate or severe, or graded 1 (mild increase in size in the ureter only) to 5 (making the ureter very big and the kidney very dilated). It can happen in one or both sides of the urinary tract, and doesn't have to be the same grade on both sides. It is a condition that occurs in up to 1 in 100 children, and many children grow out of it. It can sometimes run in families. It isn't the same as the gastro oesophageal reflux that babies get that can cause pain and vomiting.

## What else could cause a dilated ureter and kidney?

Dilated kidneys or [hydronephrosis](#) can be due to reflux, or due to a slowing in the drainage of the urine out of the kidney into the ureter as the way down is obstructed. This is sometimes called a [PUJ obstruction](#) or configuration. It can be due to a narrowing of the [ureter](#) outside the kidney leading to a bottleneck of urine inside the kidney, or due to a blood vessel overlying the ureter that presses on it. These structural abnormalities again often improve in appearance with time and as the child grows. They can usually be followed with ultrasound scans. In a small number of children, the narrowing outside the kidney leads to a lot of swelling inside the kidney and they may require a special test to see how long it takes the kidney to drain and if the work the kidney does is being affected. Although the test proves the PUJ obstruction is there it is a test usually only done if there is concern about the kidney or the need for surgery. A small number of children will eventually need surgery to relieve the obstruction.



## How are these things found?

Reflux and obstruction can be picked up in the womb (antenatally) or as part of investigations following a urinary tract infection. Sometimes these changes are found because one child in the family has a problem and their brothers and sisters are scanned. They may be suspected from ultrasound scans when one or both kidneys appears dilated or hydronephrotic, and/ or the ureters appear larger than normal. Sometimes there are reasons to do a more detailed scan called an [MCU](#) looking at the bladder and ureters to prove that reflux is there. This is no longer done as a routine investigation. We only look to prove that reflux is there if we think it would change how the child would be treated ( e.g. if there is concern that they may have [posterior urethral valves](#), if they are having a lot of urinary infections or the [hydronephrosis](#) is very severe. For [PUJ obstruction](#) the dilatation is sometimes picked up antenatally and sometimes after infection. Sometimes the first sign in older children is abdominal pain.

## Doesn't reflux need surgery to correct it?

Surgery is no longer done routinely for reflux. However there are some children in whom it would be considered, including those who have many urine infections despite being on antibiotic treatment, and who are showing signs of damage to the kidney(s). PUJ configurations sometimes need surgery if they are very large and causing problems for the kidney. For most children however surgery is not required, but they need follow up to make sure that the problems resolve or do not get worse.

## How does a child with reflux get looked after?

Most children are followed by a paediatrician (doctor who looks after children at the hospital) or by a paediatric surgeon (a surgeon who specialises in caring for children). If there is concern about how the kidneys are working and growing children may need to see a children's kidney specialist (also called a paediatric nephrologist). If your child has a fever they should get a urine check as this may be a sign of a urinary tract infection. Some children with reflux are more prone to getting urine infections and your child may be given a low dose of antibiotic at night. Children with recurrent infections or very significant abnormalities of the urinary tract are more likely to be on antibiotics, particularly when very young.

## What about the kidneys?

Sometimes children who are born with [reflux](#) are also born with abnormal kidneys. These are sometimes called [dysplastic kidneys](#). We think this is because the same genes that play a role in the development of the ureters play a role in kidney formation too. We can't always predict whose kidneys will be affected and to what extent but we know kidney damage is very rare with mild or moderate reflux. Some children may also develop damage to their kidneys over time, but this is less common than previously thought, and many of the children we thought had "scarred" kidneys from urine infections probably had abnormal kidneys from birth. Most kidneys even though they look stretched and abnormal will still function normally and clean the blood normally.

## What does this mean for my child long term

Long term most children will grow out of having reflux as the valve system matures with time and their kidneys will grow and function normally. This is particularly true in children who have low grade reflux affecting only the ureters. Even if the reflux remains, if the child is having no problems with infection there is no need for treatment. The need for antibiotics varies from child to child but most doctors stop preventive treatment in the first year or two of life. Doctors will keep an eye on how your child's kidneys are growing.

The small number of children whose kidneys are not normal, whatever the cause, will require long term follow up to check on their kidneys' growth and function.. Doctors follow kidney growth over time with [ultrasound scans](#). If there is concern about the kidneys being abnormal they can be looked at in more detail with a [nuclear medicine](#) scan, and your child will have their blood pressure checked regularly and their urine checked for protein.

## Glossary

- ◀ **Dysplastic kidneys**  
Malformed or “scarred” kidneys
- ◀ **Dysplasia**  
Malformed or “scarred” kidneys
- ◀ **Hydronephrosis**  
Hydronephrosis is the swelling of the kidneys when urine flow is obstructed in any of part of the urinary tract.
- ◀ **MCU** (micturating cystourethrogram)  
An X-ray test to examine the bladder and urethra during the voiding of water-soluble contrast material that has been previously inserted into the bladder. It demonstrates disorders of micturition and can detect vesicoureteric reflux (VUR).
- ◀ **Nuclear medicine scan**  
To perform a nuclear medicine scan, a radioactive pharmaceutical is first administered to the patient, usually intravenously. Depending on the type of scan, the pictures may be taken immediately and/or after a period of time during which the pharmaceutical localises in the target organ/system.
- ◀ **Posterior urethral valves**  
Posterior urethral valves is a condition found only in boys. It affects the urethra (the tube which runs from the bladder to the outside). The urethra has a blockage in it near the bladder. This makes it difficult to pass urine. As the bladder pushes hard to get the urine out, it causes pressure which may result in urine being pushed back from the bladder into the ureters and kidneys. This causes the kidneys and bladder to swell and may lead to kidney damage.
- ◀ **PUJ obstruction**  
A narrowing or blockage where the ureter (tube that drains the kidney to the bladder) joins to the renal pelvis (part of the kidney).
- ◀ **Ultrasound scan**  
An ultrasound scan is a painless test that uses sound waves to create images of organs and structures inside your body. It is a very commonly used test. As it uses sound waves and not radiation, it is thought to be harmless.”
- ◀ **Ureters**  
Muscular tubes that propel urine from the kidneys to the urinary bladder.
- ◀ **Vesicoureteric Reflux or Reflux**  
Vesicoureteric (or vesicoureteral) reflux (VUR) refers to a condition in which urine flows from the bladder, back up the ureter, and back into the kidneys.

