Micturating cystourethrogram (MCUG)

An imaging test

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Information for parents and carers about children's kidney conditions

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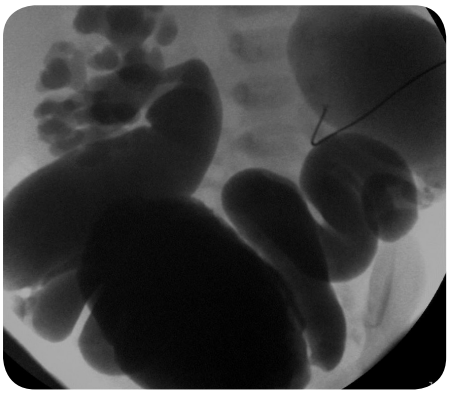
A micturating cystourethrogram (MCUG) is one type of imaging test – a test that uses special equipment to create one or more pictures of part of the inside of the body. This test may also be called a voiding cystourethrogram (VCUG).

➔ This topic gives general information. The way these tests are performed will vary between different hospitals.



About the urinary system

The **urinary system** gets rid of things that the body no longer needs, so that we can grow and stay healthy.

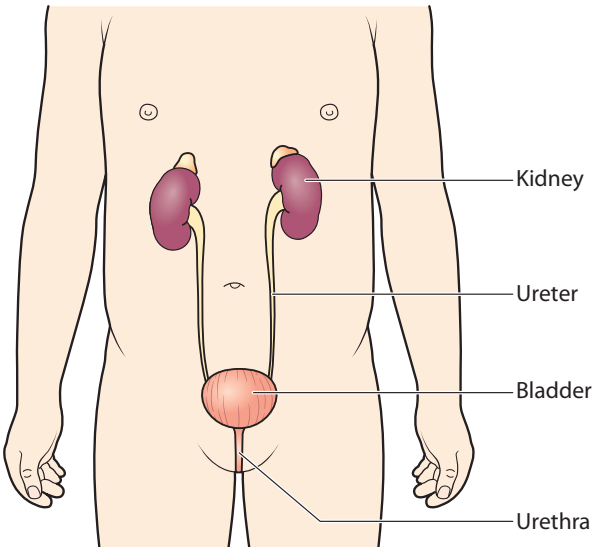
The **kidneys** are bean-shaped organs. They filter blood to remove extra water and waste in urine (wee). Most of us have two kidneys. They are on either side of our spine (backbone), near the bottom edge of our ribs at the back.

The two **ureters** are long tubes that carry urine from the kidneys to the bladder.

The **bladder** is a bag that stores urine until we are ready to urinate. It sits low down in the pelvis.

The urethra is a tube that carries urine from the bladder to the **outside** of the body.

» More about the urinary system and kidneys



What is a MCUG?

A MCUG is a special type of X-ray test that looks inside your baby's or child's body while he or she is passing urine (weeing). Both 'micturating and 'voiding' mean passing urine.

The test looks at the **bladder**, which stores urine, and the urethra, the tube that carries urine out of the body. A long thin tube called a **catheter** is put through the urethra and into the bladder. **Contrast dye** is used, which can show the flow of urine.

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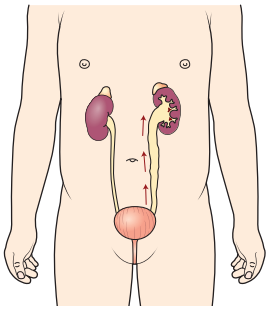
A machine directs a series of X-rays into your child's body over a period of time while his or her bladder empties. These are recorded as several images (pictures), using computerised digital equipment.

Why does my child need this test?

The MCUG can check whether the flow of urine from your child's bladder is being blocked, or whether it goes up the wrong way. It can help diagnose some conditions, including vesicoureteral reflux and posterior urethral valves.

Vesicoureteral reflux



VUR

When babies or children with **vesicoureteral reflux (VUR)** pass urine (wee), some urine refluxes, or passes back up the wrong way, towards one or both kidneys. In serious cases, this can cause the ureters (kidney drainage tubes) and the kidneys to swell, and may lead to infections. If your doctor thinks your baby or child has VUR, or if your child has frequent **urinary tract infections (UTIs)**, he or she may arrange this test.

» Read more in the infoKID topic on VUR

Posterior urethral valves

Some boys are born with **posterior urethral valves (PUV)**. These are extra flaps of tissue in the tube that carries urine out of the body (urethra). This makes it difficult to empty the bladder. If your baby or older boy finds it difficult or impossible to pass urine, your doctor may arrange this test.

» Read more in the infoKID topic on PUV

Risks and complications

What is radiation?

X-rays are one type of **ionising radiation**, a form of energy. At high levels, ionising radiation can be dangerous to humans because it can damage cells, the living parts of the body.

We are all exposed to ionising radiation – in our homes and workplaces (it is in some construction materials and it seeps from the ground into buildings), when we eat certain foods, and when we take a flight. However, this is at very low levels.

Are X-ray tests harmful?

The MCUG uses a small amount of radiation, and so is considered safe. However, your doctor will carefully consider the risks and benefits of doing this test in your child.

Discomfort or pain when passing urine

Your child may feel some discomfort or pain (like a burning sensation) when passing urine after the test, or need to go to the toilet more often. This is usually because of irritation from the catheter, and should go away after a few days. Speak with your doctor or nurse if your child continues to have problems.

You may give your child paracetamol (e.g. Calpol) to help relieve pain. Do not give ibuprofen (e.g. Brufen) if there is a possibility of kidney damage as ibuprofen can further damage kidneys.

Urinary tract infections

Babies and children who have a MCUG have a risk of a **urinary tract infection (UTI)**, when germs get into the urine and cause an infection. Your child may be prescribed medicines called antibiotics before the test and for about 48 hours (two days) after the test.

Alternatives

A cystourethrogram or MCUG is usually done when other tests have not been able to identify the cause of a problem. One alternative, when looking for **vesicoureteral reflux (VUR)**, is to use a different imaging test called a **MAG3 scan** with indirect cystogram. Children may find this test easier because it does not use a urinary catheter, however, they would need to be out of nappies and be able to pass urine when requested in order to do this test.

How to prepare your child

Remember to give your child the antibiotic medicines as instructed, if prescribed.

If your child has signs of a urinary tract infection (UTI), speak with your doctor – you may need to wait until your child is better before he or she has this test. Children with a UTI may become irritable, have a fever, have pain on weeing, feel sick or be sick.

Your doctor may prescribe antibiotics to be taken for 48 to 72 hours, to stop your child getting a UTI from the test.

Your doctor may ask whether your child has allergies to any medicines or contrast dye that may be used during the test.

Older girls may be asked if they are having their period and about the dates of their last period. They may also be asked if they are pregnant or if they could be pregnant. This is because ionising radiation may harm an unborn baby.

What happens

The cystourethrogram or MCUG normally takes place in the X-ray department of your hospital. A doctor or **radiographer**, a specialist trained in imaging tests, performs the test.

- Your child lies on the table. His or her genital area is cleaned and covered with towels.
- A **catheter** is placed through the opening where your baby or child passes urine and into the urethra. He or she may feel uncomfortable, but this should not hurt.

- The catheter is gently moved into the bladder. A small amount of contrast dye is put through the catheter, and flows into the bladder.
- A machine directs X-rays at different angles into the bladder over a period of time while your child's bladder fills and empties. The images can be seen on a screen.
- The flow of urine can be seen because of the contrast dye. The images show whether and where urine is being blocked, and whether urine passes back up towards the kidneys.
- Your child may need to change positions, so your doctor can get different views.
- Some children may feel a bit embarrassed; the staff performing the test will try to make your child feel comfortable and relaxed.

What to expect afterwards

Your child can usually go home straight away after the test.

Contact your doctor if your child has:

- blood in his or her urine for more than two days – the urine may look red (like blackcurrant squash) or brown (like a cola drink)
- pain in the lower part of his or her tummy
- signs of a urinary tract infection – such as a fever (temperature over 38°C), being sick, feeling tired or irritable, having pain or a stinging/burning feeling when passing urine, going to the toilet more often than usual or holding on because it is painful to go, or wetting the bed or themselves more often than usual.

Getting the results

The doctor or radiographer performing the test will send a report to your doctor. Speak with your doctor about when you should expect the results.

Your notes and contact information

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