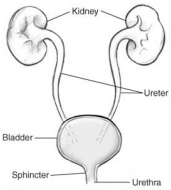


Urodynamic Studies

Monash Children's Hospital

What is it?

A "urodynamic study" is simply a study of the dynamic (active) function of the bladder. In its broadest sense, it includes both non-invasive measures of bladder function, and more formal "video-urodynamic study" (VUDS) involving placement of pressure lines.

Background

The bladder is a stretchy, muscular pouch that acts as the storage container for urine. Urine is made by the kidney and then passes down a connecting tube (ureter) to the bladder.

The urinary sphincter acts like a valve to help hold the urine in the bladder and stop it leaking out.

When it is time to void (wee), the sphincter relaxes (valve opens) and the urine passes out from the bladder through the urethra.

While the bladder is filling with urine, it is relaxing to keep the pressure inside the bladder very low. As the bladder becomes full, its wall becomes stretched. This gives the feeling of needing to go to the toilet. Bladder pressure increases during voiding to expel all the contained urine.

Invasive urodynamics - VUDS

A video-urodynamic study (VUDS) is a test that gives specific information about bladder function.

It can characterise:

- bladder muscle activity with filling
- bladder pressure with filling and emptying
- bladder compliance (stretchiness)
- what happens as the bladder empties

It is the *only* test that can give information about bladder compliance (stretchiness), bladder muscle activity (stability) and actual bladder pressures during filling and emptying.

Who needs VUDS?

Children may need a video-urodynamic study if the information required cannot be gained in any other way. This is often the case in the investigation of a bladder that is high pressure (neurogenic) or 'leaky (incontinent).

Non-invasive urodynamics

This includes measures of bladder capacity, activity and emptying. This information may be gained through:

Bladder diary

This involves keeping a chart of fluid input and output; recording drinks and wees for a fixed period, noting urinary frequency and volume, as well as sensation. It provides useful information on 'functional capacity'; that is the usual working capacity of the bladder during normal activities. (see 'Bladder Diary Instructions' page)

Uroflowmetry

This involves weeing into a special toilet that can record the speed, duration and volume of a urinary stream. This can give important information about how the bladder is emptying.

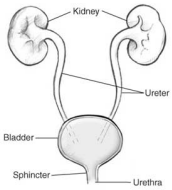
Post-void residual scan

This is a bladder ultrasound performed immediately after voiding to assess how completely the bladder is emptying.

Urinary tract ultrasound

This is a detailed ultrasound of the entire urinary tract. It can show dilatation of the kidneys and ureters (sometimes an indication of bladder pressure), bladder wall thickness and shape.

Patients are usually asked to drink as much as they can and "hold-on" before this test. It can thus show the maximum capacity of the bladder, and efficiency of emptying from this point.



Urodynamic Studies

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What happens during the VUDS test?

A video-urodynamic study is usually performed in the radiology department or a special suite with x-ray facilities. It takes about an hour.

A urology nurse and paediatric urologist will perform the procedure. A radiographer may help moving the X-ray table and taking the pictures.

You will be able to stay in the room with your child during the procedure, but will need to wear a lead gown or step behind a screen whilst X-ray pictures are taken.

Your child will lie down on the X-ray table. A catheter is inserted into the bladder through the urethra. This may be uncomfortable. In some children, this catheter is placed through the abdominal wall directly into the bladder during a procedure the previous day. A tube may also be inserted into the rectum via the anus (bottom).

The catheter has two channels. A fluid line is attached to one channel. Pressure transducers are attached to the other catheter channel, and to the tube in the rectum. Your child will be asked to cough to check that the pressure transducers are working.

Once everything is set up the test will start. Contrast fluid will flow through the catheter into the bladder. The pressure transducers record the pressure in the bladder as it is filling. X-rays are taken to show the shape of the bladder. Your child will be asked to tell the doctor when they feel that they need to go to the toilet, or that they start leak. When the bladder is full, your child will be asked to void into a special toilet with a flow monitor. A check X-ray is taken after voiding to check emptying.

Sometimes the bladder needs to be refilled more than once to get all the information needed.

When the study is complete, the tubes are removed. This does not hurt.

What happens afterwards?

The urologist will often discuss the results of the test with you, immediately after the procedure. They may make recommendations about your child's treatment on the day. If your child is being managed by another doctor, the information will be conveyed to the treating doctor, along with the recommendations. You should arrange review with your child's doctor to discuss the results.

You will be able to take your child home after the procedure.

Your child may feel a little uncomfortable when voiding for the next 24 hours. It helps if they drink plenty of fluids to flush the bladder.

There may be some blood in the urine after the test (pink or red in colour). This should clear within 24 hours, and will also be helped by drinking plenty of fluids.

If your child develops a high temperature, or has persisting blood stained urine they should return to the emergency department.