



Bladder and Bowel Community

Factsheet: Urodynamics

How the Urinary System Works

Our kidneys produce urine continuously. The urine contains excess liquid and waste products from the body and it passes down the *ureters*, tubes which lead from the kidneys to the bladder. On average, we produce about two to three pints (around 1½ litres) every 24 hours, but this depends on the amount we eat, drink and sweat.

The bladder is normally relaxed and expands gently as it fills. The outlet valve (the *sphincter*) is closed, and the muscles of the *pelvic floor* support the bladder (and our other abdominal organs), helping keep the outlet tube (the *urethra*) closed. Our brains subconsciously monitor how full the bladder is, and eventually we begin to feel the need to empty it - well before it is actually full - and can look out for a suitable opportunity to visit the toilet.

The amount our bladder can hold depends (among other things) on how we have 'trained' it - from infancy onwards - but most of us need to empty our bladder from 4 to 8 times a day. When we pass water, the sphincter muscle relaxes, opening the outlet from the bladder, and at the same time the muscles in the wall of the bladder (the *detrusor* muscle), contract strongly and squeeze the urine out. Then the process starts all over again.

What can go wrong?

The correct function of the urinary system therefore depends on a complex operation involving the detrusor muscle, the sphincter, the pelvic floor and the nervous system that monitors and coordinates them, for much of the time without us being aware. If any of these elements goes wrong, we may experience problems controlling our bladders.

It is not always apparent from our own conscious experience and from what we can report to doctors or nurses what the origin of the problems is. This is where *urodynamics* can help. The word refers to a range of procedures that are used to test how your bladder fills and empties itself, so that nurses or doctors can diagnose what exactly is going wrong or can confirm a provisional diagnosis, especially in complex cases where there may be an interaction of different problems. Urodynamics can also help prior to surgery and some other types of treatment.

Tests are normally conducted at a hospital and the machines and techniques differ from place to place. If you have any questions about the particular procedure they use, you should not hesitate to ask the staff at your hospital.

Basic Urodynamics

Although the techniques of urodynamics differ from hospital to hospital, most procedures follow a similar process. The basic aim is to measure the way the bladder fills and empties and in particular the changes of pressure inside the bladder and in the abdomen generally as the bladder fills and empties.

You will probably be asked to arrive at the hospital with a full bladder. On arrival, the staff will take you to a room and ask you to pass urine into a special toilet. This toilet is fitted with equipment to measure your flow of urine.

Following an explanation of the procedure, the staff will prepare the main part of the test. Firstly, two very fine plastic tubes (catheters) are passed into the outlet tube of your bladder (the urethra). Some hospitals use a local anaesthetic gel when inserting these catheters but this is not always necessary.

One of the tubes is attached to a supply of sterile fluid so that it can be used to fill the bladder artificially. The other is attached to a machine which records the pressure in the bladder. Next another fine tube is placed in the back passage (rectum). This tube also is attached to the machine to record the pressure inside your abdomen.

Once the tubes are in place, the doctor or nurse will start filling your bladder via the tubes. He/she will usually ask you to say when you first feel the desire to pass water and describe how you feel as your bladder fills. You may be asked to do a few simple things, such as cough or perhaps stand up and jump. This is used to test how the bladder behaves when put under stress from bladder pressure.

Depending upon why the test is being performed you may be asked to pass urine again into the special toilet.

The doctor may also perform another test on how your outlet tube (urethra) closes by asking you to squeeze the muscles under your pelvis as one of the small catheter tubes is being withdrawn.

Specialist Tests

A number of hospitals have very specialised equipment which allows the doctor to examine your bladder while performing these tests. This uses ultrasound or x-rays to produce video pictures. If an x-ray technique is used, the tests will be performed on a special x-ray table which is capable of being tilted into an upright position.

A relatively new development (*ambulatory urodynamics*) is miniature equipment which can be worn unobtrusively while you go about your normal activities. This is used to monitor your bladder under less artificial conditions. The equipment records its results and the doctor or nurse will read them when you return after (typically) a few hours.

What problems can Urodynamics diagnose?

There is a large number of bladder problems which can be diagnosed using urodynamic tests. The most common of these are:

Overactive Bladder - where the bladder muscle contracts irregularly during filling. This creates a strong desire to pass urine (known as *urgency*) which it is difficult to suppress and may require very frequent visits to the toilet or even leakage (known as *urge incontinence*).

Stress Incontinence – this will show that the bladder is filling and emptying normally during the test, however there will be leakage of urine with coughing or jumping. If video urodynamics is performed then this can be seen on the video screen.

Neurogenic Bladder - sometimes called an Hypotonic or Atonic Bladder. This is a bladder which is not able to produce a good enough contraction to empty properly. The amount of urine left in the bladder [residual] after each void may vary. If the residual is excessive then this could lead to gross episodes of incontinence which may be known as *overflow incontinence*. If the residual is reduced then the bladder symptoms may be similar to the unstable bladder described above

Obstructions to the flow - These can be caused by a number of problems including a narrowing of the outlet tube from the bladder (a stricture) or (in men) enlargement of the prostate gland; they too can give rise to the type of leakage known as *overflow incontinence*. Obstruction may also be due to neurogenic causes. The bladder neck may fail to relax as the bladder muscle is contracting [bladder

neck obstruction] or the urethra may fail to relax as the bladder muscle is contracting.

Incompetence of the sphincter -If the *sphincter* (the ring of muscle which keeps the outlet tube from the bladder shut) is weak, leakage (called *stress incontinence*) can occur when you do something, for example, cough, laugh or take exercise.

What happens after the test?

Your consultant will normally discuss the findings with you either immediately after the test or at a later appointment. Advice and treatment may then be offered depending upon the type of bladder problem diagnosed.

There is a risk of infection from the test which your doctor should discuss with you. Such infections are easy to treat and your doctor will advise you should you be concerned.

Further Help

If you are concerned about your problem and it is starting to affect your day to day life make an appointment to see your doctor, continence nurse or specialist physiotherapist. A continence nurse and specialist physiotherapist are healthcare professionals who specialise in bladder and bowel problems.

You can contact find out where your nearest continence clinic is by going to the Help and Info section on www.bladderandbowel.org and clicking on Find a Healthcare Professional

The Bladder and Bowel Community provides information and support for people with bladder and bowel issues. We publish a wide range of user friendly booklets and factsheets.

For more information please call us on 01926 357220, email help@bladderandbowel.org or write to us at The Bladder and Bowel Community, 7 The Court, Holywell Business Park, Northfield Road, Southam, CV47 0FS.

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