

Urinary Investigations

Tests and procedures used to check function of the urinary system

With thanks to Dr. Julie Russell, Royal Hospital for Sick Children, Glasgow

One of a series of fact sheets produced by the Family Support Service

There are many tests that can be done to check that the urinary system is functioning as well as possible. The tests vary from a simple blood test to more invasive procedures.

INVESTIGATIONS

Urine Tests (also called urinalysis)

Urine Microscopy

Blood cells and bacteria in the urine can indicate problems such as urine infection and stones.

Urine Culture and Sensitivity

This is where a sample of urine is taken to see if there are any harmful bacteria (germs) growing in it. The same sample can be used to find out what antibiotics will kill these germs.

Creatinine Clearance

Urine is collected for a period of 24 hours then tested to measure the amount of creatinine in it. A blood sample is taken at the same time to compare levels.

Creatinine levels are raised if there is advanced renal (kidney) disease because creatinine cannot be excreted (got rid of) by the kidneys which are seriously damaged.

BLOOD TESTS

Blood consists of plasma in which the blood cells are suspended. The most numerous cells are the red blood cells which help carry oxygen around the body. About a tenth of the cells are white cells and their main job is to fight infection.

Blood is taken for the following tests:

Full Blood Count (FBC)

This measures your haemoglobin levels (found in your red blood cells) to make sure you are not anaemic; the number size and shape of your red cells, to make sure they work properly; and the number of your white cells. If there are more white cells than normal it may be a sign of infection somewhere.

C-Reactive Protein

This is found in the blood if there is an infection. The levels rise in response to infection and drop when the infection passes.

Erythrocyte Sedimentation Rate (ESR)

This is another test to look for infection but is rarely used.

Urea and Electrolytes (U and E)

Urea is the main end product of protein breakdown and is excreted by the kidneys. Urea rises if renal function is impaired. Electrolytes are a common name for the body's salt, such as sodium. If you are dehydrated the sodium and urea may be raised.

Liver Function Tests (LFT)

Liver function can be affected by kidney disease and medications. Body proteins including albumin are produced by the liver and reflects the kidney function.

IMAGING TESTS

Urodynamics

A urodynamics study helps to decide what will be the best form of treatment for you. Urodynamics means the study of the pressure and flow of urine in the lower renal tract, (the bladder, and the tube through which you pass urine, called the urethra). You will usually be asked to go for the test with a full bladder (for those who can manage it). When you arrive you will be asked to pass urine into a special toilet or commode which can measure the rate at which your urine flows and the amount you pass. This is done in private. You will then be asked to lie down on an x-ray table or a couch. Catheters (tubes) will then be passed into your bladder through your urethra. These are used to fill and empty the bladder and measure pressure in the bladder and urethra.

Another catheter is passed into your rectum (back passage). This measures abdominal pressure.

When the test is finished the catheters are removed. The whole test takes between half an hour to one hour.

Urodynamic testing varies from one hospital to another.

Kidney/Bladder Scan

This measures the bladder volume and can indicate whether the bladder is large or small. It is a non-invasive procedure which uses ultra-sound waves. Gel is put onto your tummy and a small smooth instrument is pressed over the skin.

Micturating Cystourethrogram (MCUG)

This is an x-ray examination where dye is put in the bladder through a catheter. This can be done to detect reflux (backward flow) of urine from the bladder up the ureters to the kidneys.

The following tests are less common:

Cystoscopy

An instrument which looks like a small telescope is passed into the bladder via the urethra (tube through which urine leaves the bladder) to have a look at the bladder.

Diethylene Triamine Pentacetic Acid (DTPA) Scan

A radio nuclide (DTPA) is injected into the body and a special camera shows it flowing through the kidneys. The DTPA scan is not used as much as a DMSA scan. A DMSA (Dimercaptosuccinic Acid) Scan is similar to the DTPA scan. This detects hold-up of urine flow.

Retrograde Pyelography

Under general anaesthetic, fine catheters are passed through the bladder, up the ureters into the pelvis of the kidneys (on the bottom edge of the kidney). Dye is injected directly into the renal pelvis and x-ray pictures are taken.

Loopogram

This is an injection of dye into the loop of a urostomy. It can show reflux back into the kidneys, how they empty, and if there is thinning of the tubes out of the kidney.

Intravenous Pyelogram (IVP)

A dye which shows up on x-rays is injected into a vein. When the dye has worked its way around the body a succession of x-ray pictures are taken of the urinary tract. The IVP reveals details of the kidneys, ureters and bladder. It tests kidney function and reveals the presence of stones in the kidneys or ureters and other abnormalities of the urinary tract. It can take 15 to 20 minutes for the injected dye to reach the kidneys.

After the test you may be asked to pass urine and another x-ray taken to see if you have any urine left in your bladder.

SURGICAL PROCEDURES

Following the results of any tests that you have done, your doctor may decide that one or more of specialised surgical procedures may be suggested and there are further information sheets available from the Family Support Service. Once again they will be carried out with your consent and should be fully explained prior to the start of the operation.

Vesicostomy

A small cut made in the tummy and into the bladder and a connection created. This allows urine to drain from the bladder and relieves high pressure within the bladder.

Supra Pubic Catheterisation

A catheter is passed into the bladder via a small incision (cut) on the tummy. A leg bag is attached and urine drains out continuously.

Indwelling Catheterisation

A catheter (tube) is passed into the bladder via the urethra to drain urine. The catheter remains in the bladder and a bag is attached to collect the urine. The bag is usually strapped to the leg and is hidden by clothing. The catheter is usually changed about every 3 months.

Intermittent Self-Catheterisation

(See separate sheet)

The following are rarely used:

Ureterostomy

Under general anaesthetic, a ureter is brought out on to the surface of the skin. Urine drains directly from the kidney into a suitable vessel, eg. Bag.

Urethroplasty

This is just another way of saying a surgical repair of the urethra.

Ileal Conduit

The ureter is implanted into a segment of bowel which is then opened out on to the surface of the skin to form a stoma. The urine can then drain from the kidney to a collection appliance ("stoma bag") fixed over the stoma. This way the urine does not go into the bladder at all.

If you have any questions or would like further information, please do not hesitate to contact the Family Support Workers at:

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