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Urodynamic Evaluation

Introduction

Urodynamics is an in-depth evaluation of the **anatomy**, or structure, and function of the lower urinary tract that includes the bladder and **urethra (your-e-thra)**, the tube that carries urine from the bladder out of the body.

These studies are important in diagnosing problems of loss of urinary control, the inability to pass urine, frequency of urination and other urinary problems.

The urodynamic evaluation is different in every patient and for each diagnosis. As many as 15 different tests could be involved with a complete evaluation, but in most cases, fewer tests are needed to make a diagnosis.

The tests may evaluate the physical structure of the bladder, using x-rays and telescopes, and evaluate the nerves and muscles that control the function of the bladder. A complete evaluation may take up to two hours or could require more than one appointment.

Tests

Here are descriptions of tests that may be performed as part of the urodynamic evaluation:

Urinalysis is the microscopic analysis of urine. Infection and bleeding are evaluated with urinalysis. Chemical tests using a special 'dipstick' also check the urine for blood, protein, sugar and acidity.

Urine culture and sensitivities are tests of urine to check for infection. Tiny amounts of **fresh** urine are placed on special gels and then placed in an incubator. Evaluation of the growth (if any) is then done at 24 and 48 hours. If bacteria are found, then special disks that contain individual antibiotics are placed on the growing bacteria to see which antibiotics are effective in treating the infections. Disk 'sensitivities' are not done if no bacteria are found.

Cystoscopy is a procedure that is used to visually inspect the bladder and the urethra. This can be done in most instances without discomfort by the use of an anesthetic jelly. The patient lies on a special table. The urethra is cleaned and the anesthetic jelly placed into the urinary channel for a short time to numb it.

The cystoscope or telescope is inserted through the urethra into the bladder and the inspection is carried out. Afterwards, the patient might have a little discomfort when they urinate and perhaps a spot of blood for a day or so. A warm bath helps to relieve this irritation. Antibiotics

might be prescribed for a few days afterwards.

The **cystometrogram, or CMG,** is a study of the pressure and sensation of the bladder as it fills. A **catheter**, or small tube, is placed into the bladder. The bladder is then slowly filled with either water or gas, usually carbon dioxide. As the bladder fills, the patient will first develop the sensation of filling, followed by the sense of the need to urinate, and then a definite need or urge to urinate. The doctor notes the exact volume of filling for each of these events and the pressure in the bladder throughout the study. The patient is then asked to try to urinate to measure the amount of pressure or strength that the bladder muscles can create.

In some cases, a measurement of the pressure in the rectum will also be measured at the same time. This tells the doctor how much pressure the abdomen and bowels contents are placing on the bladder from the outside.

Leak point pressure is another measurement done during a cystometrogram. A small pressure- sensitive probe is placed into the bladder. With straining or coughing and with enough pressure to cause urine loss, the pressure in the bladder can be measured.

The **electromyogram, or EMG,** is a study of the nerves to the pelvic area. As a comparison, an electrocardiogram, or EKG, is a form of electromyogram of the heart. Since measuring electrodes cannot be placed directly on the bladder, we measure the muscles of the pelvic floor, the area around the anus, called the **'levators'**. This gives the doctor information about the nerve and muscle tone of some of the sphincters that hold the urine in.

The uroflow is a study to determine the flow rate of urine during **voiding**, or urinating. To make sure that the test is done properly, patients must come to the office with a full bladder. They will be asked upon arrival to void into a measuring device with as much force as possible. Sometimes, the doctor will fill the bladder with water using a catheter to make sure it is full for the uroflow.

The **post void residual (PVR)** is a measurement of the amount of urine left behind in the bladder after urination. This can be accomplished by either draining the remaining urine with a catheter, or by taking an ultrasound image of the bladder that calculates the amount.