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For patients

Enlarged Prostate (BPH)

Benign Prostatic Hyperplasia (BPH) is a non-cancerous enlargement of the prostate, a common condition among men over 45 years of age. The degree to which the prostate grows varies from man to man as they age and may narrow the urethra and cause difficulty with urination. Some patients with untreated BPH may suffer complications such as recurrent urinary tract infections, bladder or kidney damage, bladder stones and problems with urination.

Your doctor may evaluate your condition by asking you questions about the severity and type of symptoms you have and how much of an impact they have on your daily routine. Other tests such as urine flow study, digital rectal exam, prostate-specific antigen (PSA) blood test, cystoscopy, ultrasound or prostate MRI may be used to confirm the diagnosis. Treatment for BPH may depend on the severity of the symptoms and range from no treatment to medication or surgery.

What is benign prostatic hyperplasia?

Benign prostatic hyperplasia (BPH), or benign prostatic hypertrophy, is an enlargement of the prostate, a walnut-sized gland that forms part of the male reproductive system. During ejaculation, the prostate secretes fluid into the urethra (http://www.radiologyinfo.org) . The urethra is the tube that carries urine from the bladder out of the body. In a man, the prostate surrounds the urethra just below the bladder. When a man urinates, the bladder (http://www.radiologyinfo.org) squeezes urine out through the urethra.

As a man ages, the prostate can become enlarged. Because it surrounds the urethra right at the bladder exit, the prostate may squeeze the urethra as it gets larger over time. This may cause difficulty with urination such as a slow stream, the need to strain, increased frequency, urgency to urinate, incomplete emptying of the bladder, and intermittent flow or dribbling.

BPH is the most common disorder of the prostate gland and the most common diagnosis by urologists (http://www.radiologyinfo.org) for males between the ages of 45 and 74. More than half of men in their sixties and as many as 90 percent in their seventies and eighties have some symptoms of BPH.

Although research has yet to pinpoint a specific cause for BPH, theories focus on hormones and related substances like dihydrotestosterone (DHT), a testosterone-like hormone that may encourage the growth of cells.

How is BPH diagnosed and evaluated?

Early diagnosis of BPH is important because – for some patients – it can lead to urinary (http://www.radiologyinfo.org) tract infections, bladder or kidney (http://www.radiologyinfo.org) damage, bladder stones and incontinence when left untreated. Distinguishing BPH from more serious diseases like prostate cancer is important.

Tests vary from patient to patient, but the following are the most common:

- Filling out a questionnaire: Your doctor is most interested in the severity and type of symptoms you have, and how much they bother you or impact your life. A simple questionnaire is a common starting point.

- Urine flow study: During this test, the patient voluntarily empties his bladder and the amount of flow is measured. A special device can help physicians detect reduced urine flow associated with BPH.
- Digital rectal examination (DRE): The physician inserts a gloved finger into the rectum (located next to the prostate) and feels the back of the prostate. Prostate cancers can sometimes be detected as lumps or bumps on the prostate here.
- Prostate-specific antigen (PSA) blood test: Elevated levels of PSA in the blood can occur with BPH or with prostate cancer.
- Cystoscopy: In this examination, the physician inserts a thin tube with a tiny camera on the end called a cystoscope through the opening of the urethra at the tip of the penis. The camera allows the physician to inspect the inside of the prostate, urethra channel and bladder.
- Transrectal ultrasound (https://www.radiologyinfo.org/en/info/us-prostate) and Prostate Biopsy: There are two potential reasons for this exam: (1) If there is suspicion for prostate cancer, this test may be recommended. The physician uses an ultrasound probe to acquire images of the prostate and guides a biopsy needle into the prostate to remove small slivers of tissue for examination under a microscope. (2) Your doctor may simply want to know the exact size of your prostate to plan prostate surgery for BPH. In this case, only an ultrasound image will be obtained; no needles will be used.
- Transabdominal ultrasound (https://www.radiologyinfo.org/en/info/abdominus) : This exam may be performed to measure the size of the prostate and the amount of urine left in the bladder after urination.
- Prostate magnetic resonance imaging (MRI) (https://www.radiologyinfo.org/en/info/mr_prostate) : MRI provides views of the entire prostate with excellent soft tissue contrast.

How is BPH treated?

In some cases, in particular where symptoms are mild, BPH requires no treatment. At the opposite extreme, some men require immediate intervention if they cannot urinate at all or if kidney/bladder damage has occurred. When treatment is necessary, many men will simply require daily medication(s). If this fails to completely treat the symptoms, or if there are signs of damage from BPH, the doctor may recommend minimally invasive (http://www.radiologyinfo.org) surgery (no "cuts" into the abdomen). Or, in some cases, traditional surgery may be recommended.

- Drug treatment: The FDA has approved several drugs to relieve common symptoms associated with an enlarged prostate, including drugs that inhibit the production of the hormone DHT and drugs that relax the muscle of the prostate and bladder neck to improve urine flow.

For surgery, there are many procedures to choose from, and the choice depends largely on your specific prostate anatomy, and surgeon preference and training. These procedures all have a common goal of widening the urethral channel as it passes through the prostate. Procedures include the following:

- Transurethral resection of the prostate (TURP): One of the more common surgical treatments for BPH, TURP involves the insertion of an instrument called a resectoscope through the urethra to remove the obstructing tissue, almost like removing the core from an apple, thus widening the channel.
- Laser surgery: When a TURP procedure is done with a laser instead of traditional removal of part of the prostate, the procedures are similar although differently named, depending on the type of laser used. The physician passes the laser fiber through the urethra into the prostate and then delivers bursts of energy to vaporize obstructing prostate tissue.
- Transurethral incision of the prostate (TUIP): In this procedure, the surgeon widens the urethra by making a few small incisions in the prostate gland and the neck of the bladder where it joins the urethra.
- Transurethral microwave thermotherapy (TUMT): In TUMT, a device sends computer-regulated microwaves through a catheter to heat and destroy excess prostate tissue. TUMT does not cure BPH, but it reduces urinary problems.
- Transurethral needle ablation (TUNA): This minimally invasive approach delivers low-level radiofrequency energy through twin needles to destroy prostate tissue and widen the urinary channel, which may improve urine flow.
- UroLift system treatment: This minimally invasive procedure widens the urethra by placing tiny implants that pull the enlarged prostate tissue around your urethra out of the way, thus improving urine flow.
- High-intensity focused ultrasound (HIFU): The use of ultrasound waves to destroy prostate tissue is a promising new area

of treatment that is still undergoing clinical trials in the United States.

- Open surgery: For very large prostates, traditional TURP and laser surgery may be ineffective. In open surgery, the surgeon makes an external incision and removes the enlarged tissue from inside the gland. The entire prostate is not removed, but rather the outer "shell" or capsule of the prostate remains.
- Holmium Laser Enucleation of the Prostate (HoLEP): This is a minimally invasive version of the traditional open surgery, reserved for large prostates. No incision is made. This is a specialized type of procedure currently performed only by select centers in the United States. The procedure duplicates open surgery, with a shorter time requiring a urinary catheter.
- Water vapor therapy: another minimally invasive treatment, in this case a device is passed through the urethra to shrink portions of the prostate using water vapor or "steam."
- Prostate artery embolization: For this procedure, an interventional radiologist inserts a tiny catheter into the artery that supplies blood to the prostate. The radiologist will then inject material to slow or stop blood flow to the prostate, which will cause it to shrink or soften. This is a relatively new procedure and may only be available in select centers.

Which test, procedure or treatment is best for me?

- *Lower Urinary Tract Symptoms-Suspicion of Benign Prostatic Hyperplasia (https://www.radiologyinfo.org/en/info/acs-lower-urinary-tract-symptoms)*

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