

The National Kidney and Urologic Diseases Information Clearinghouse

National Institute of Diabetes and Digestive and Kidney Diseases

National Institutes of Health

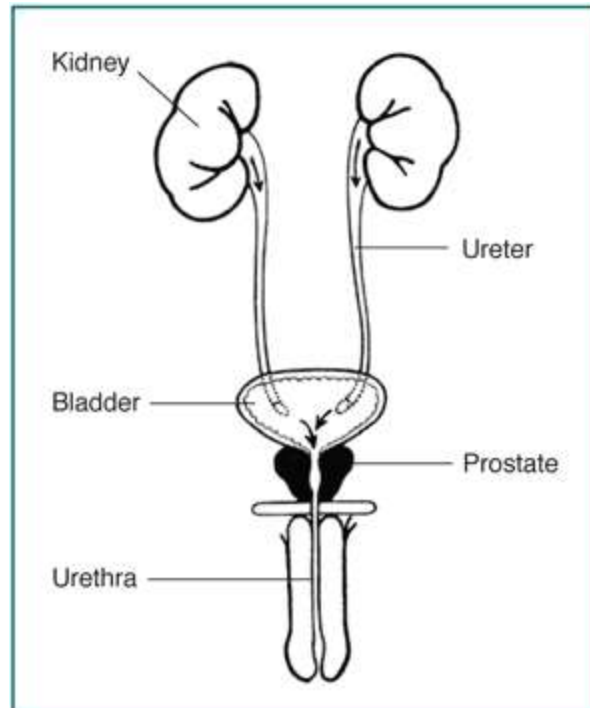
The Prostate Gland

The prostate is a walnut-sized gland that forms part of the male reproductive system. The gland is made of two lobes, or regions, enclosed by an outer layer of tissue. As the diagrams show, the prostate is located in front of the rectum and just below the bladder, where urine is stored. The prostate also surrounds the urethra, the canal through which urine passes out of the body.

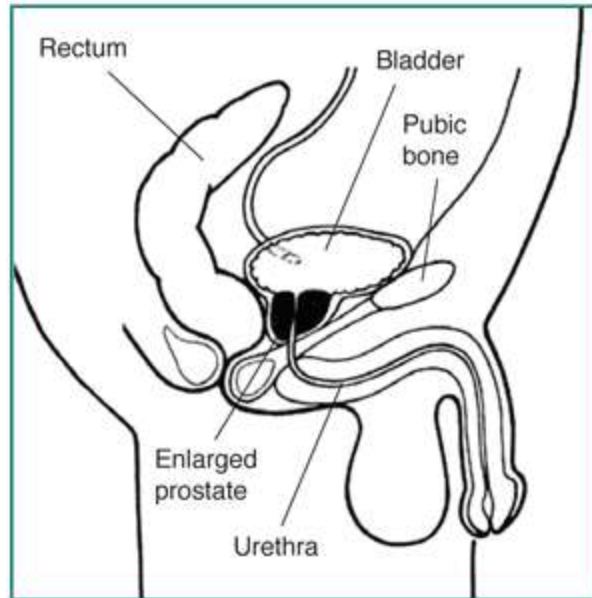
Scientists do not know all the prostate's functions. One of its main roles, though, is to squeeze fluid into the urethra as sperm move through during sexual climax. This fluid, which helps make up semen, energizes the sperm and makes the vaginal canal less acidic.

Benign Prostatic Hyperplasia: A Common Part of Aging

It is common for the prostate gland to become enlarged as a man ages. Doctors call this condition benign prostatic hyperplasia (BPH), or benign prostatic hypertrophy.



Normal urine flow.



Urine flow with BPH.

As a man matures, the prostate goes through two main periods of growth. The first occurs early in puberty, when the prostate doubles in size. At around age 25, the gland begins to grow again. This second growth phase often results, years later, in BPH.

Though the prostate continues to grow during most of a man's life, the enlargement doesn't usually cause problems until late in life. BPH rarely causes symptoms before age 40, but more than half of men in their sixties and as many as 90 percent in their seventies and eighties have some symptoms of BPH.

As the prostate enlarges, the layer of tissue surrounding it stops it from expanding, causing the gland to press against the urethra like a clamp on a garden hose. The bladder wall becomes thicker and irritable. The bladder begins to contract even when it contains small amounts of urine, causing more frequent urination. Eventually, the bladder weakens and loses the ability to empty itself, so some of the urine remains in the bladder. The narrowing of the urethra and partial emptying of the bladder cause many of the problems associated with BPH.

Many people feel uncomfortable talking about the prostate, since the gland plays a role in both sex and urination. Still, prostate enlargement is as common a part of aging as gray hair. As life expectancy rises, so does the occurrence of BPH. In the United States in 2000, there were 4.5 million visits to physicians for BPH.

Why BPH Occurs

The cause of BPH is not well understood. No definite information on risk factors exists. For centuries, it has been known that BPH occurs mainly in older men and that it doesn't develop in men whose testes were removed before puberty. For this reason, some

researchers believe that factors related to aging and the testes may spur the development of BPH.

Throughout their lives, men produce both testosterone, an important male hormone, and small amounts of estrogen, a female hormone. As men age, the amount of active testosterone in the blood decreases, leaving a higher proportion of estrogen. Studies done on animals have suggested that BPH may occur because the higher amount of estrogen within the gland increases the activity of substances that promote cell growth.

Another theory focuses on dihydrotestosterone (DHT), a substance derived from testosterone in the prostate, which may help control its growth. Most animals lose their ability to produce DHT as they age. However, some research has indicated that even with a drop in the blood's testosterone level, older men continue to produce and accumulate high levels of DHT in the prostate. This accumulation of DHT may encourage the growth of cells. Scientists have also noted that men who do not produce DHT do not develop BPH.

Some researchers suggest that BPH may develop as a result of “instructions” given to cells early in life. According to this theory, BPH occurs because cells in one section of the gland follow these instructions and “reawaken” later in life. These “reawakened” cells then deliver signals to other cells in the gland, instructing them to grow or making them more sensitive to hormones that influence growth.

Symptoms

Many symptoms of BPH stem from obstruction of the urethra and gradual loss of bladder function, which results in incomplete emptying of the bladder. The symptoms of BPH vary, but the most common ones involve changes or problems with urination, such as

- a hesitant, interrupted, weak stream
- urgency and leaking or dribbling
- more frequent urination, especially at night

The size of the prostate does not always determine how severe the obstruction or the symptoms will be. Some men with greatly enlarged glands have little obstruction and few symptoms while others, whose glands are less enlarged, have more blockage and greater problems.

Sometimes a man may not know he has any obstruction until he suddenly finds himself unable to urinate at all. This condition, called acute urinary retention, may be triggered by taking over-the-counter cold or allergy medicines. Such medicines contain a decongestant drug, known as a sympathomimetic. A potential side effect of this drug may prevent the bladder opening from relaxing and allowing urine to empty. When partial obstruction is present, urinary retention also can be brought on by alcohol, cold temperatures, or a long period of immobility.

It is important to tell your doctor about urinary problems such as those described above. In eight out of 10 cases, these symptoms suggest BPH, but they also can signal other, more serious conditions that require prompt treatment. These conditions, including prostate cancer, can be ruled out only by a doctor's examination.

Severe BPH can cause serious problems over time. Urine retention and strain on the bladder can lead to urinary tract infections, bladder or kidney damage, bladder stones, and incontinence—the inability to control urination. If the bladder is permanently damaged, treatment for BPH may be ineffective. When BPH is found in its earlier stages, there is a lower risk of developing such complications.

Diagnosis

You may first notice symptoms of BPH yourself, or your doctor may find that your prostate is enlarged during a routine checkup. When BPH is suspected, you may be referred to a urologist, a doctor who specializes in problems of the urinary tract and the male reproductive system. Several tests help the doctor identify the problem and decide whether surgery is needed. The tests vary from patient to patient, but the following are the most common.

Digital Rectal Examination (DRE)

This examination is usually the first test done. The doctor inserts a gloved finger into the rectum and feels the part of the prostate next to the rectum. This examination gives the doctor a general idea of the size and condition of the gland.

Prostate-Specific Antigen (PSA) Blood Test

To rule out cancer as a cause of urinary symptoms, your doctor may recommend a PSA blood test. PSA, a protein produced by prostate cells, is frequently present at elevated levels in the blood of men who have prostate cancer. The U.S. Food and Drug Administration (FDA) has approved a PSA test for use in conjunction with a digital rectal examination to help detect prostate cancer in men who are age 50 or older and for monitoring men with prostate cancer after treatment. However, much remains unknown about the interpretation of PSA levels, the test's ability to discriminate cancer from benign prostate conditions, and the best course of action following a finding of elevated PSA.

A fact sheet titled “The Prostate-Specific Antigen (PSA) Test: Questions and Answers” can be found on the National Cancer Institute website at www.cancer.gov/cancertopics/factsheet/Detection/PSA.