

*Prostate cancer is the most common type of cancer in men in the United States (other than skin cancer).*

Benign prostatic hyperplasia (BPH) is the abnormal growth of benign prostate cells. In BPH, the prostate grows larger and pushes against the urethra and bladder, blocking the normal flow of urine. More than half of the men in the United States between the ages of 60 and 70 and as many as 90 percent between the ages of 70 and 90 have symptoms of BPH. Although this condition is seldom a threat to life, it may require treatment to relieve symptoms.

Most cancers are named for the type of cell or organ in which they begin. Cancer that begins in the prostate is called primary prostate cancer (or prostatic cancer). Prostate cancer may remain in the prostate gland, or it may spread to nearby lymph nodes. Prostate cancer may also spread to the bones, bladder, rectum, and other organs.

When cancer spreads to other parts of the body, the new tumor has the same malignant cells and the same name as the primary tumor. For example, if prostate cancer spreads to the bones, the cancer cells in the new tumor are prostate cancer cells. The disease is metastatic prostate cancer; it is not bone cancer.

## Symptoms

*Early prostate cancer often does not cause symptoms. When symptoms of prostate cancer do occur, they may include some of the following problems:*

- A need to urinate frequently, especially at night;
- Difficulty starting urination or holding back urine;

- Inability to urinate;
- Weak or interrupted flow of urine;
- Painful or burning urination;
- Painful ejaculation;
- Blood in urine or semen; and/or
- Frequent pain or stiffness in the lower back, hips, or upper thighs.

Any of these symptoms may be caused by cancer or by other, less serious health problems, such as BPH or an infection. Only a doctor can tell the cause. A man who has symptoms like these should see his family doctor or a urologist (a doctor who specializes in treating diseases of the genitourinary system). Do not wait to feel pain; early prostate cancer does not cause pain.

## Diagnosis

*If symptoms occur, the doctor asks about the patient's medical history, performs a physical exam, and may order laboratory tests. The exams and tests may include the following:*

- **Digital rectal exam**—the doctor inserts a gloved, lubricated finger into the rectum and feels the prostate through the rectal wall to check for hard or lumpy areas.
- **Blood tests**—a lab measures the levels of prostate-specific antigen (PSA) and prostatic acid phosphatase (PAP) in the blood. The level of PSA in the blood may rise in men who have prostate cancer, BPH, or an infection in the prostate. The level of PAP rises above normal in many prostate cancer patients, especially if the cancer has spread beyond the prostate. The doctor cannot diagnose

prostate cancer with these tests alone because elevated PSA or PAP levels may also indicate other, noncancerous problems. However, the doctor will take the results of these tests into account in deciding whether to check the patient further for signs of cancer.

- **Urine test**—a lab checks the urine for blood or infection.

*The doctor may order other tests to learn more about the cause of the symptoms and to help determine whether conditions of the prostate are benign or malignant, such as:*

- **Transrectal ultrasonography**—sound waves that cannot be heard by humans (ultrasound) are sent out by a probe inserted into the rectum. The waves bounce off the prostate, and a computer uses the echoes to create a picture called a sonogram.
- **Intravenous pyelogram**—a series of x-rays of the organs of the urinary tract.
- **Cystoscopy**—a procedure in which a doctor looks into the urethra and bladder through a thin, lighted tube.

If test results suggest that cancer may be present, the patient will need to have a biopsy. A biopsy is the only sure way to know whether a problem is cancer. During a biopsy, the doctor removes a small amount of prostate tissue, usually with a needle. A pathologist looks at the tissue under a microscope to check for cancer cells. If cancer is present, the pathologist usually reports the grade of the tumor. The grade tells how closely the tumor resembles normal prostate

tissue and suggests how fast the tumor is likely to grow. One way of grading prostate cancer, called the Gleason system, uses scores of 2 to 10. Another system uses G1 through G4. Tumors with lower scores are less likely to grow or spread than tumors with higher scores.

If the physical exam and test results do not suggest cancer, the doctor may recommend medicine to reduce the symptoms caused by an enlarged prostate. Surgery is another way to relieve these symptoms. The surgery used in such cases is transurethral resection of the prostate (TURP or TUR). In TURP, an instrument is inserted through the penis to remove prostate tissue that is pressing against the upper part of the urethra.

## Research To Understand Prostate Cancer

Prostate cancer is an important public health problem. Prostate cancer accounts for one of every three cancers among American men. Researchers are conducting studies to learn more about the causes and early detection of this common disease.

## Causes and Prevention

The causes of prostate cancer are not yet understood. Researchers are looking at factors that may increase the risk of this disease. The more they can learn about these factors, the better the chance of finding ways to prevent and treat prostate cancer.

Studies in the United States show that prostate cancer is found mainly in men over age 55; the average age of patients at the time of diagnosis is 72.

This disease is more common in black men than in white men. In fact, black men in the United States have the highest rate of prostate cancer in the world. Doctors cannot explain why one man gets prostate cancer and another does not, but they do know that no one can “catch” prostate cancer from another person. Prostate cancer is not contagious.

Some studies have shown that a man has a higher risk for prostate cancer if his father or brother has had the disease. However, researchers are uncertain why some families have a higher incidence of prostate cancer.

Scientists are studying the effects of diet. Some evidence suggests that a diet high in fat increases the risk of prostate cancer and a diet high in fruits and vegetables decreases the risk, but these links have not been proven.

Researchers have studied whether having a vasectomy increases a man's risk for prostate cancer. Some studies suggest there may be such a link, but other studies have not supported this claim.

Other studies show that farmers and workers exposed to the metal cadmium during welding, electroplating, or making batteries may have an increased risk of getting this disease. Also, workers in the rubber industry appear to develop prostate cancer more often than members of the general public. However, more research is needed to confirm these results.

Scientists are also doing studies to determine whether BPH or a sexually transmitted virus increases the risk for prostate cancer. At this time, they do not have clear evidence of increased risk in either case.

Men over age 55 can take part in a study of finasteride (trade name Proscar<sup>®</sup>), a drug used to treat BPH. This nationwide NCI study, called the Prostate Cancer Prevention Trial, is designed to help doctors learn whether finasteride can prevent prostate cancer. The Cancer Information Service can provide information about this study.

## Detection

Researchers are studying ways to screen men for prostate cancer (check for the disease in men who have no symptoms). At this time, it is not known whether screening actually saves lives. The NCI-supported Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial is designed to show whether certain tests can detect these cancers early enough to reduce the number of deaths they cause. For prostate cancer, this trial is looking at the usefulness of screening with digital rectal exam and checking the PSA level in the blood in men ages 55 to 74. The results of this trial may change the way men are screened for prostate cancer. The Cancer Information Service can provide information about this trial.

Men should talk with their doctor about prostate cancer, the symptoms to watch for, and an appropriate schedule of checkups. The doctor's advice will be based on the risks and benefits of diagnosis and treatment, as well as a man's age, medical history, and other factors.