

Early Prostate Cancer: Questions and Answers

Key Points

- The prostate is a gland in the male reproductive system that makes and stores a component of semen (see Question 1).
- The most common risk factor for prostate cancer is age (see Question 3).
- Prostate cancer often does not cause symptoms for many years. By the time symptoms occur, the disease may have spread beyond the prostate (see Question 4).
- The symptoms of prostate cancer can also be caused by noncancerous conditions (see Questions 4 and 5).
- Two tests can be used to detect prostate cancer in the absence of any symptoms: a digital rectal exam and a blood test to detect a substance made by the prostate called prostate-specific antigen (PSA) (see Questions 6 and 7).
- The diagnosis of prostate cancer can be confirmed only by a biopsy (see Question 8).
- Prostate cancer is described by both grade and stage (see Question 8).
- Three treatment options are generally accepted for men with localized prostate cancer: radical prostatectomy, radiation therapy, and surveillance (also called watchful waiting) (see Questions 9, 10, and 11).

1. What is the prostate?

The prostate is a gland in the male reproductive system. The prostate makes and stores a component of semen and is located in the pelvis, under the bladder and in front of the rectum. The prostate surrounds part of the urethra, the tube that empties urine from the bladder. A healthy prostate is about the size of a walnut. Because of the prostate's location, the flow of urine can be slowed or stopped if the prostate grows too large.



2. What is prostate cancer?

Prostate cancer forms in the tissues of the prostate. Except for skin cancer, cancer of the prostate is the most common malignancy in American men. It is estimated that 218,890 men in the United States will be diagnosed with prostate cancer in 2007 (1). In most men with prostate cancer, the disease grows very slowly. The majority of men with low-grade, early prostate cancer (which means that cancer cells have been found only in the prostate gland) live a long time after their diagnosis. Even without treatment, many of these men will not die of the prostate cancer, but rather will live with it until they eventually die of some other, unrelated cause. Nevertheless, it is estimated that nearly 27,000 men will die from prostate cancer in 2007 (1).

3. Who is at risk for prostate cancer?

An important risk factor is age; more than 70 percent of men diagnosed with this disease are over the age of 65. African American men have a substantially higher risk of prostate cancer than white men, including Hispanic men. Dramatic differences in the incidence of prostate cancer are also seen in different populations around the world. There is some evidence that dietary factors are involved, such as vitamin E and selenium, which may have a protective effect. Genetic factors also appear to play a role, particularly for families in which the diagnosis is made in men under age 60. The risk of prostate cancer rises with the number of close relatives who have the disease.

4. What are the symptoms of prostate cancer?

Prostate cancer often does not cause symptoms for many years. By the time symptoms occur, the disease may have spread beyond the prostate. When symptoms do occur, they may include:

- Urinary problems:
 - Not being able to urinate.
 - Having a hard time starting or stopping the urine flow.
 - Needing to urinate often, especially at night.
 - Weak flow of urine.
 - Urine flow that starts and stops.
 - Pain or burning during urination.
- Difficulty having an erection.
- Blood in the urine or semen.
- Frequent pain in the lower back, hips, or upper thighs.

These can be symptoms of cancer, but more often they are symptoms of noncancerous conditions. It is important to check with a doctor.

5. What other prostate conditions can cause symptoms like these?

As men get older, their prostate may grow bigger and block the flow of urine or interfere with sexual function. This common condition, called benign prostatic hyperplasia (BPH), is not cancer, but can cause many of the same symptoms as prostate cancer. Although BPH may not be a threat to life, it may require treatment with medicine or surgery to relieve symptoms. An infection or inflammation of the prostate, called prostatitis, may also cause many of the same symptoms as prostate cancer. Again, it is important to check with a doctor.

6. Can prostate cancer be found before a man has symptoms?

Yes. Two tests can be used to detect prostate cancer in the absence of any symptoms. One is the digital rectal exam (DRE), in which a doctor feels the prostate through the rectum to find hard or lumpy areas. The other is a blood test used to detect a substance made by the prostate called prostate-specific antigen (PSA). Together, these tests can detect many “silent” prostate cancers that have not caused symptoms. Due to the widespread implementation of PSA testing in the United States, approximately 90 percent of all prostate cancers are currently diagnosed at an early stage, and, consequently, men are surviving longer after diagnosis.

At present, however, it is not known whether routine prostate screening saves lives. Screening is a term used to describe tests when they are done in individuals who are not experiencing any symptoms. The benefits of screening and local therapy (surgery or radiation) remain unclear for many patients. Because of this uncertainty, the National Cancer Institute (NCI), a part of the National Institutes of Health, is currently supporting research to learn more about screening men for prostate cancer. Currently, researchers are conducting a large study to determine whether screening men using a blood test for PSA and a DRE can help reduce the death rate from this disease. They are also assessing the risks of screening. Full results from this study, the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial (PLCO), are expected by 2015.

7. How reliable are the screening tests for prostate cancer?

Neither of the screening tests for prostate cancer is perfect. Most men with mildly elevated PSA levels do not have prostate cancer, and many men with prostate cancer have normal levels of PSA. Also, the DRE can miss many prostate cancers. The DRE and PSA test together are better than either test alone in detecting prostate cancer.

A recent study examining the PSA histories of men enrolled in the Baltimore Longitudinal Study of Aging (BLSA) suggests that PSA velocity may be a better indicator of potentially life-threatening cancer than PSA level. PSA velocity is the rate at which serum PSA levels change over time. The study found that men who had a PSA velocity above 0.35 ng/ml per year had a higher relative risk of dying from prostate cancer than men who had a PSA velocity less than 0.35 ng/ml per year (2). More studies

are needed to determine if PSA velocity more accurately detects potentially life-threatening prostate cancer early.

The NCI Early Detection Research Network (EDRN) has a Prostate Collaborative Group, which is applying a variety of strategies to find better ways to detect prostate cancer early. In addition, the NCI's prostate cancer Specialized Program of Research Excellence (SPORE) program is funding projects to identify new biomarkers to detect prostate cancer.

8. How is prostate cancer diagnosed?

The diagnosis of prostate cancer can be confirmed only by a biopsy. During a biopsy, a urologist (a doctor who specializes in diseases of urinary and sex organs in men, and urinary organs in women) removes tissue samples, usually with a needle. This is generally done in the doctor's office with local anesthesia. Then a pathologist (a doctor who identifies diseases by studying tissues under a microscope) checks for cancer cells.

Men may have blood tests to see if the cancer has spread. Some men also may need the following imaging tests:

- **Bone scan:** The doctor injects a small amount of a radioactive substance into a blood vessel. It travels through the bloodstream and collects in the bones. A machine called a scanner detects and measures the radiation. The scanner makes pictures of the bones on a computer screen or on film. The pictures may show cancer that has spread to the bones.
- **CT scan:** An x-ray machine linked to a computer takes a series of detailed pictures of areas inside the body. Doctors often use CT scans to see the pelvis or abdomen.
- **MRI:** A strong magnet linked to a computer is used to make detailed pictures of areas inside the body.

Prostate cancer is described by both grade and stage.

- **Grade** describes how closely the tumor resembles normal prostate tissue. Based on the microscopic appearance of tumor tissue, pathologists may describe it as low-, medium-, or high-grade cancer. One way of grading prostate cancer, called the Gleason system, uses scores of 2 to 10. Another system uses G1 through G4. In both systems, the higher the score, the higher the grade of the tumor. High-grade tumors generally grow more quickly and are more likely to spread than low-grade tumors.

- **Stage** refers to the extent of the cancer. Early prostate cancer, stages I and II, is localized. It has not spread outside the gland. Stage III prostate cancer, often called locally advanced disease, extends outside the gland and may be in the seminal vesicles. Stage IV means the cancer has spread beyond the seminal vesicles to lymph nodes and/or to other tissues or organs.

9. How is localized prostate cancer treated?

Three treatment options are generally accepted for men with localized prostate cancer: radical prostatectomy, radiation therapy (with or without hormonal therapy), and surveillance (also called watchful waiting).

- **Radical prostatectomy** is a surgical procedure to remove the entire prostate gland and nearby tissues. Sometimes lymph nodes in the pelvic area (the lower part of the abdomen, located between the hip bones) are also removed. Radical prostatectomy may be performed using a technique called nerve-sparing surgery that may prevent damage to the nerves needed for an erection. However, nerve-sparing surgery is not always possible.
- **Radiation therapy** involves the delivery of radiation energy to the prostate. The energy is usually delivered in an outpatient setting using an external beam of radiation. The energy can also be delivered in a technique known as brachytherapy, which involves implanting radioactive seeds in the prostate using a needle. Patients with high-risk prostate cancer are candidates for adding hormonal therapy to standard radiation therapy.
- **Active Surveillance (watchful waiting)** may be an option recommended for patients with early-stage prostate cancer, particularly those who have low-grade tumors with only a small amount of cancer seen in the biopsy specimen. These patients have regular examinations, PSA testing, and sometimes scheduled biopsies. If there is evidence of cancer growth, active treatment may be recommended. Older patients and those with serious medical problems may also be good candidates for active surveillance.

10. How does a patient decide what is the best treatment option for localized prostate cancer?

Choosing a treatment option involves the patient, his family, and one or more doctors. They will need to consider the grade and stage of the cancer, the man's age and health, and his values and feelings about the potential benefits and harm of each treatment option. Since both surgery and radiation therapy are options for localized disease, consultation with both a urologist and a radiation oncologist is recommended. Often it is useful to seek additional opinions—from the same type of doctor, an internist, a family practice physician, or a medical oncologist. Because there are several reasonable options for most patients, patients may hear different opinions and recommendations and the

decision can be difficult. However, patients should try to get as much information as possible and allow themselves enough time to make a decision. There is rarely a need to make a decision without taking time to discuss and understand the pros and cons of the various approaches.

11. Where can a person find more information about prostate cancer and its treatment?

The NCI has several other resources that readers may find helpful, including the following:

- The *Prostate Cancer* home page provides links to NCI resources about prevention, screening, treatment, clinical trials, and supportive care for this type of cancer. This page can be found on the NCI's Web site at <http://www.cancer.gov/cancertopics/types/prostate> on the Internet.
- *Prostate Cancer (PDQ®): Treatment* includes information about prostate cancer treatment, including surgery, chemotherapy, radiation therapy, and hormone therapy. This summary of information from PDQ, the NCI's comprehensive cancer information database, is available at <http://www.cancer.gov/cancertopics/pdq/treatment/prostate/patient/> on the Internet.
- *Treatment Choices for Men With Early-Stage Prostate Cancer* describes the treatment choices available to men diagnosed with early-stage prostate cancer and examines the pros and cons of each treatment. This NCI fact sheet is available at <http://www.cancer.gov/cancertopics/prostate-cancer-treatment-choices> on the Internet.

Selected References

1. Ries LAG, Melbert D, Krapcho M, et al. *SEER Cancer Statistics Review, 1975–2004*. Bethesda, MD: National Cancer Institute, 2007.
2. Carter HB, Ferrucci L, Kettermann A, et al. Detection of life-threatening prostate cancer with prostate-specific antigen velocity during a window of curability. *Journal of the National Cancer Institute* 2006; 98(21):1521–1527.

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Related NCI materials and Web pages:

- National Cancer Institute Fact Sheet 5.29, *The Prostate-Specific Antigen (PSA) Test: Questions and Answers* (<http://www.cancer.gov/cancertopics/factsheet/Detection/PSA>)

- *Treatment Choices for Men With Early-Stage Prostate Cancer*
(<http://www.cancer.gov/cancertopics/prostate-cancer-treatment-choices>)
- *Understanding Prostate Changes: A Health Guide for Men*
(<http://www.cancer.gov/cancertopics/understanding-prostate-changes>)
- *What You Need To Know About™ Prostate Cancer*
(<http://www.cancer.gov/cancertopics/wyntk/prostate>)
- Prostate Cancer Home Page (<http://www.cancer.gov/cancertopics/types/prostate>)

For more help, contact:

NCI's Cancer Information Service

Telephone (toll-free): 1-800-4-CANCER (1-800-422-6237)

TTY (toll-free): 1-800-332-8615

LiveHelp[®] online chat: <https://cissecure.nci.nih.gov/livehelp/welcome.asp>

This fact sheet was reviewed on 9/21/07