PROSTATE CANCER:

What it is and how it is treated

A Booklet for Patients

ZENECA
Pharmaceuticals

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Introduction

When a man learns that he has prostate cancer, he usually has many questions about what prostate cancer is and how the disease can be treated. It is also normal for men with prostate cancer, their families, and others close to them to have fears and concerns. Most men and those who care about them find that their distress eases as prostate cancer treatment begins and as they gain an understanding of the disease.

This booklet is for you and those close to you. It is designed to help you understand and cope with your illness. It explains prostate cancer, how it develops, and what its effects are. The booklet discusses prostate cancer's possible impact on your life and how it can be treated. It also describes what doctors and other health care professionals know about treating this disease today.

While helping you to understand prostate cancer and its treatment, this booklet probably will not answer all of your questions. As you read, you may wish to write down any questions you have so that you can ask your doctor about them. Words that may be unfamiliar to you are *underlined* and *italicized*, and defined briefly in the text. More complete definitions and space for you to write down your notes and questions can be found at the end of the booklet.

After you read this booklet, you and your doctor will probably want to talk further about your illness and treatment and, together, you will plan the treatment that is best for you.

What is cancer?

The human body is made up of billions of *cells*. Normally, cells function for a while, then die, and are replaced in an orderly fashion. This results in an appropriate number of properly organized cells that perform specific functions.

Occasionally, however, cells are replaced in an uncontrolled way and may lack the organization needed for normal function. An abnormal growth of cells is called a *tumor*. There are two kinds of tumors: *malignant* tumors (cancers) and *benign* tumors (noncancerous growths).

Because of their enlarging size, growths, or tumors, squeeze surrounding parts of the body and expand into nearby areas. This can cause pain and interfere with normal function, but it is seldom life-threatening.

Cancerous tumors can invade nearby groups of cells or *tissues*, crowding out and destroying normal cells. Cancer cells may also break away from tumors and enter the body fluids, which allow such cells to spread to other parts of the body. This process is called *metastasis*. Cancerous tumors that spread to other parts of the body (metastatic cancers) can threaten a person's life.

The body fluids that can carry cancer cells are the blood and the *lymph*. Most people know about blood and blood vessels but may not be familiar with the lymph. The lymph is a nearly clear fluid that drains waste from cells. This fluid travels through vessels and small bean-shaped structures called *lymph nodes*. One function of the nodes is to filter unwanted substances, such as cancer cells, out of the fluid. If there are too many cancer cells, however, the nodes cannot remove all of them.

There are more than 100 different types of *cancer*. Among American men, the most frequently diagnosed (aside from skin cancer) is prostate cancer. In the United States, approximately 317,000 men will be diagnosed with prostate cancer in 1996—and the incidence is rising. It is estimated that by the end of the century, there will be 90% *more* prostate cancer diagnoses than in the early 1980s.*

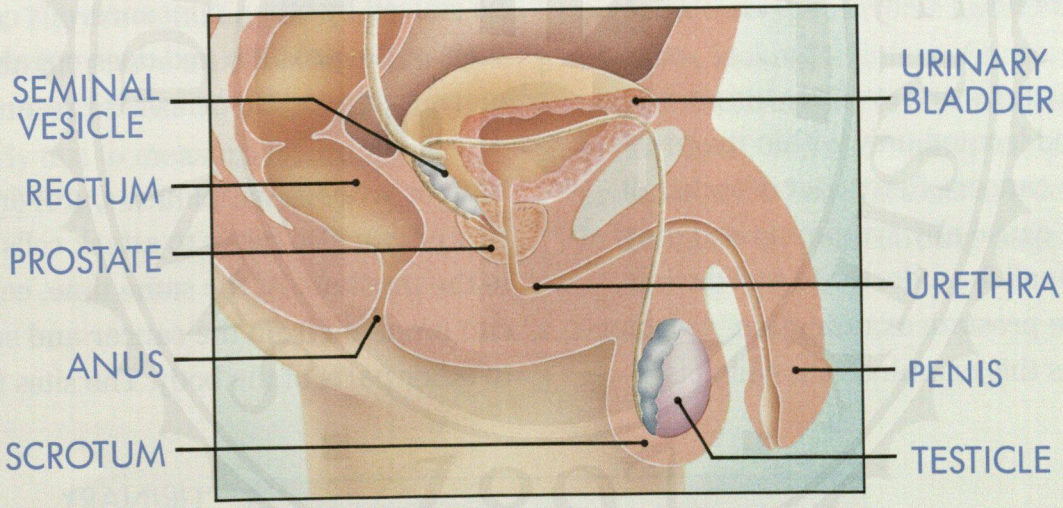
*Carter HB, Coffey DS. The prostate: an increasing medical problem. *Prostate.* 1990;16(1):39-48.

What is the prostate?

The prostate is one of the male sex glands. The other major sex glands in men are the *testicles* and the *seminal vesicles*. Together, these glands secrete the fluids that make up semen.

The prostate is about the size of a walnut. It lies just below the urinary bladder and surrounds the upper part of the *urethra*. The urethra is the tube that carries urine from the *bladder* and semen from the sex glands out through the penis.

As one of a man's sex glands, the prostate is affected by male sex hormones. These hormones stimulate the activity of the prostate and the replacement of prostate cells as they wear out. The chief male hormone is *testosterone*, which is produced almost entirely by the testicles.



How is prostate cancer diagnosed?

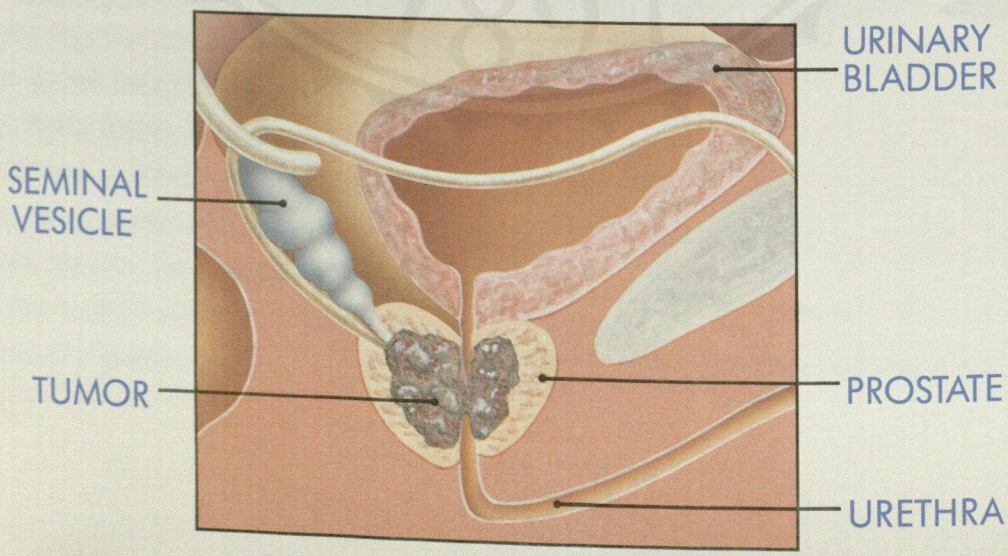
The cause of prostate cancer is unknown. It is known, however, that the growth of cancer cells in the prostate, like that of normal prostate cells, is stimulated by male hormones, especially testosterone.

Compared with other types of cancer, prostate cancer is relatively slow growing. In fact, many men with prostate cancer will not die *from* it but *with* it. The risk of developing prostate cancer increases with age, with more than 80% of cases diagnosed in men over the age of 65.

When a cancerous prostate tumor is small and located only within the prostate, the cancer often is not detected. It may not cause any symptoms and may be too small for a doctor to feel during a routine prostate examination. A doctor performs this examination, which is called a *digital rectal examination* (DRE), by inserting a finger into the *rectum* to feel the size and shape of the prostate.

A man may live for many years without ever having the cancer discovered. As the cancer grows, however, the prostate may eventually squeeze the urethra, which it surrounds (see illustration below). Then, symptoms such as difficulty in urinating may develop. This is usually the first symptom of prostate cancer. (It is important to note that difficulty in urinating can be caused by other, noncancerous conditions of the prostate and does not always mean that prostate cancer is present.)

With or without symptoms, a growing cancer can also begin to attack cells close to the prostate. At the same time, cells can break off from the cancer and spread to other parts of the body. The sites to



which prostate cancer tends to spread are the lymph nodes, the lungs, and various bones, especially the bones of the hip and lower back.

Like the main prostate tumor, the tumors that have spread to other areas of the body expand and squeeze other body parts. When prostate cancer spreads, the most common symptom is bone pain. The American Cancer Society (ACS) has developed guidelines to help doctors detect prostate cancer during its early stages. They recommend that men 40 and older have a DRE every year. In addition, men over 50 should also have a yearly test to measure *prostate-specific antigen* (PSA) in their blood.

PSA is a substance produced by both normal and cancerous prostate cells. When prostate cancer grows or when other prostate diseases are present, the amount of PSA in the blood often increases. If either the DRE or the PSA blood test is positive, ACS guidelines recommend that a *transrectal ultrasonography* (TRUS) test be performed to verify the results.

To detect prostate cancer and to determine the size and extent of the spread—or *stage*—of the disease, your doctor may perform tests that involve feeling the prostate, looking at internal parts of the body, measuring the levels of substances in the blood, and examining samples of prostate cells. Specific tests are described in the chart on the following page.

Diagnosis and staging tests

Examinations and visualizations

Digital rectal examination (DRE)	Insertion of a gloved, lubricated finger into the rectum to feel the prostate
Chest x-ray	An image that can show whether cancer has spread to the lungs or other structures such as the ribs
Bone scan	A picture that can show whether cancer has spread to bone
Transrectal ultrasonography (TRUS)	A picture of the prostate and nearby structures that is produced by sound waves directed at the prostate by an instrument inserted into the rectum
Computed tomography (CT)	A picture produced by a computer from x-rays, showing the prostate and other nearby parts of the body
Intravenous pyelogram (IVP)	An x-ray of the kidneys, *ureters*, and bladder that is taken after the patient has been injected with a special dye
Magnetic resonance imaging (MRI)	A picture produced by a computer and a high-powered magnet that shows the prostate and other nearby parts of the body

Blood tests

Prostate-specific antigen (PSA)	A test useful both in diagnosis and follow-up of prostate cancer that detects a blood substance that often increases in cases of prostate cancer and other prostate diseases

Tissue samples

Prostate biopsy	The removal and microscopic examination of a small sample of a prostate tumor to determine whether it contains cancer cells
Pelvic node dissection (also called lymphadenectomy)	A procedure used to help determine whether prostate cancer has spread—typically done during surgery to remove the prostate

How are treatment methods chosen?

In developing a treatment plan, you and your doctor must discuss the advantages and disadvantages of each treatment. The benefits of treatment depend on how large the cancer already is and how far it may have spread—in other words, its stage.

Why is it important for your doctor to determine the stage of your prostate cancer? Because only by knowing how the cancer is behaving and exactly where it is in the body can the best treatment for you be chosen.

The benefits of treatment can be substantial. If started in an early stage of prostate cancer, treatment may cure the disease. If treatment is started in a later stage, it can extend life and help relieve symptoms. In the United States, 61% of men diagnosed with prostate cancer are still alive 10 years after beginning treatment—and nearly half after 15 years.

As a result of new and improved developments in treatment, men with prostate cancer are now living longer and with less discomfort and fewer treatment-related side effects.

Prostate cancer can be treated by one or more of the following methods:

- Watchful waiting
- Surgery
- Radiation therapy
- Hormone therapy
- Chemotherapy

The method selected to treat prostate cancer depends on its stage, its speed of growth, and the age and general health of the patient. Treatment choice also is based on how sexual and other side effects might affect a patient's personal life and other aspects of health. All these factors can and should be discussed thoroughly by you and your doctor.

At the present time, certain choices are made more frequently than others for the treatment of each stage of prostate cancer. Your doctor will tell you the stage of your disease. Prostate cancer stages and common treatment choices are listed on pages 10 and 11; the treatments are described more completely in the next section. (Note: The equivalent stages in the old A, B, C, D system are given in parentheses.)

Stage T1 (Stage A)

T refers to the size of the primary tumor. In stage T1, the tumor is located within the prostate only. It causes no symptoms and is too small to be felt during a DRE or to be seen on an imaging scan. These tumors are usually found by chance during surgery for a benign tumor or for some other prostate disease or by follow-up on screening tests that measure PSA.

Common treatment choices

Sometimes surgery or *radiation therapy*. In other cases, no treatment at all may be needed. Instead, the cancer is simply watched *(watchful waiting)* by your doctor using regular DREs and blood tests. Treatment may be started later if necessary.

Stage T2 (Stage B)

The tumor is still located only within the prostate but is large enough to be felt during a DRE. There are often no symptoms.

Common treatment choices

Surgery or radiation therapy. *Hormone therapy* may also be used in combination with radiation therapy. In some cases, a short course of hormone therapy may be used prior to surgery in order to reduce the size of the prostate and make its removal easier.

Stage T3 (Stage C)

The tumor has spread from the prostate into the immediately surrounding tissue, possibly including the seminal vesicles.

Stage T4 (no equivalent in A, B, C, D system)

The tumor is still within the pelvic region but may have spread farther to areas of the bladder or rectum.

Common treatment choices

Surgery, radiation therapy, or both. In addition, hormone therapy both before and after surgery or radiation therapy may be used.

Stage N+ (Stage D1)

N refers to the extent of lymph node involvement. Prostate cancer is described as N+ if prostate cancer cells are detected in lymph nodes in the pelvic area.

Stage M+ (Stage D2)

M refers to the presence or absence of metastases. A tumor that is M+ has spread beyond the pelvic area to other parts of the body. Bone pain, weight loss, and tiredness are common symptoms.

Common treatment choices

Hormone therapy. *Chemotherapy* may be used later if hormone therapy is no longer working.

The treatment of prostate cancer can have a negative effect on your sex life if you are now sexually active. Some treatment methods involve removing all or part of the prostate. These methods may also affect your ability to *ejaculate*, or release semen. Other methods involve lowering the level of the male hormone testosterone. These methods may affect sexual desire and the ability to have erections. In many cases, the result is *impotence* (the inability to have an erection). The risk of this side effect and others must be considered when choosing methods of treatment.

How is prostate cancer treated?

Prostate cancer can be treated in many ways. Each of the specific treatment methods is described below.

Removal of the prostate by surgery

Surgery can be used to remove cancer from the prostate and from nearby areas to which the cancer has spread. It is most often used during the cancer's early stages (Stages T1 and T2), when prostate cancer is located only within the prostate. Surgery may help prevent further spread of the cancer. If the cancer is small and located exclusively within the prostate, the surgery may cure the disease.

One surgical procedure is called *perineal prostatectomy*. It involves removing the cancer through the perineum, the area between the *scrotum* and the *anus*. The entire prostate is removed, together with any nearby cancer.

Another procedure is called *retropubic prostatectomy*. It consists of removing the cancer through the lower abdomen. The entire prostate is removed, and if necessary, nearby pelvic lymph nodes are removed as well.

A *transurethral resection of the prostate*, or TURP, involves removing benign tissue from the prostate by inserting an instrument through the urethra in the penis. Only part of the prostate is removed by this technique. This is usually done to relieve symptoms and make urinating easier. It does not cure prostate cancer.

Advantages

Prostatectomy is a one-time procedure that may cure prostate cancer in its early stages and may help extend life in the later stages. Surgery avoids the problems seen with radiation therapy. These problems are discussed in the next section.

Disadvantages

Prostatectomy is a major operation that requires hospitalization and can produce side effects, including impotence, *incontinence* (loss of urinary control), and narrowing of the urethra, which can make urination difficult. Impotence occurs in a high percentage of patients. In recent years, however, the percentage of men with impotence following surgery has decreased because of a new nerve-sparing surgical technique. Incontinence occurs in only a small percentage of patients.

Radiation therapy

Radiation therapy uses high-energy rays to kill prostate cancer cells, shrink tumors, or prevent cancer cells from dividing and spreading. Because the rays cannot be directed perfectly, they may damage both cancer cells and healthy cells nearby. If the dose of radiation is small and spread out over time, however, the healthy cells are able to recover and survive, and the cancer cells eventually die.

Radiation therapy is usually used when prostate cancer has not spread beyond the prostate (Stages T1-T2). It can help prevent the cancer from spreading further. Like surgery, radiation therapy works best when the cancer is located in a small area. In early stages of prostate cancer, radiation therapy may cure the disease. Radiation therapy may also be used alone or in combination with hormone therapy when cancer cells have spread beyond the prostate to the pelvic area (Stages T3-T4) and for pain relief in prostate cancer that is no longer responding to hormone therapy and has spread to the bones (Stage M+).

There are two ways in which the high-energy rays can be delivered. In *external beam radiation therapy*, the rays are delivered by a machine, and the radiation is given in brief sessions, usually one session each weekday for several weeks.

In *internal radiation therapy* (brachytherapy), the rays come from tiny radioactive seeds inserted directly into the prostate. The seeds are inserted while the patient is under anesthesia; they are too small to cause discomfort. They give off rays continually for about a year and remain safely in place for the rest of a person's life. Internal radiation therapy does not make the patient radioactive.

Another form of internal radiation is delivered by injection and is used to control bone pain in patients with metastasized (Stage M+) prostate cancer that no longer responds to hormone therapy. Radioactive compounds have been found that go directly to the bone and may give dramatic pain relief to many patients with discomfort.

Advantages

Avoids major surgery. Radiation therapy may cure prostate cancer in its early stages and may help extend life in later stages. It rarely causes loss of urinary

control, and it leads to impotence less frequently than does surgery. New injectable radioactive compounds, such as those containing radioactive strontium, can provide pain relief from cancer that has spread to the bone. These new compounds have fewer side effects than do the radioactive phosphorous compounds that have been available for many years.

Disadvantages

Radiation therapy can cause a variety of side effects. Most of these are minor and disappear after therapy stops. These side effects include tiredness, skin reactions in the treated areas, frequent and painful urination, upset stomach, diarrhea, and rectal irritation or bleeding. When radiation therapy is provided by an external machine, it can cause later development of impotence in some patients. Internal radiation therapy causes impotence less often, but may be associated with decreased white blood cell and platelet counts.

Hormone therapy

Hormone therapy is most commonly used to treat cancer that has spread (metastasized) outside the pelvic area (Stages N+ and M+). Two types of hormone therapy can be used: 1) surgical removal of the testicles, which produce male hormones, or 2) drugs that prevent the production or block the action of testosterone and other male hormones. Hormone therapy cannot cure prostate cancer. Instead, it slows the cancer's growth and reduces the size of the tumor or tumors.

Hormone therapy in combination with radiation therapy or surgery is also used in advanced stages of cancer when the disease has spread locally beyond the prostate (Stages T3-T4). This therapy helps extend life and relieve symptoms. When the cancer has spread beyond the prostate, complete surgical removal of the prostate is not common. In patients with early-stage cancer (Stage T2), hormone therapy may be used in combination with radiation therapy. A short course of hormone therapy can also be used prior to surgery to reduce the size of the prostate and make it easier to remove.

The primary strategy of hormone therapy is to decrease the production of testosterone by the testicles. Regardless of the method of hormone therapy, however, the decrease in testosterone can result in certain side effects. These commonly include hot flashes, a loss of sexual desire, and impotence.

The specific methods used to reduce testosterone production or block the actions of testosterone and other male hormones are described below:

Surgical removal of the testicles

An operation called *orchiectomy* removes the testicles, which produce 95% of the body's testosterone.

Advantages

Orchiectomy is an effective procedure that is relatively simple and performed only once. Often, the patient is given a local anesthetic and is allowed to go home the same day as surgery.

Disadvantages

Orchiectomy is a surgical procedure, and many patients prefer a nonsurgical option if it will work as well. Many men also find it difficult to accept this type of surgery. Depending on the kind of anesthesia used, there may be special risks in certain types of patients. Orchiectomy may in some cases require hospitalization, and it is not reversible.

Estrogen therapy

Another method, although not used much anymore, is to administer a female hormone such as *estrogen*. Female hormones reduce the production of testosterone by the testicles. The most commonly used estrogen in prostate cancer is diethylstilbestrol, or DES.

Advantages

Estrogen therapy is simple and involves taking a pill. Unlike orchiectomy, estrogen therapy does not involve removal of the testicles, and its effects can be reversed.

Disadvantages

Estrogen therapy produces various side effects of its own. Estrogens can cause water retention, embarrassing breast growth and tenderness, and symptoms such as stomach upset, nausea, and vomiting. In addition, even low doses of estrogen may significantly increase the risk of heart and blood vessel problems.

LHRH therapy

Another method of treatment consists of administering a drug called a *luteinizing hormone-releasing hormone* analogue (or an *LHRH analogue)*; this leads to a drop in testosterone. Taking an LHRH analogue works just as well as removal of the testicles but does not involve surgery. Currently available LHRH analogues are

ZOLADEX® (goserelin acetate) and Lupron® (leuprolide acetate).

Advantages

Administering LHRH analogue therapy is simple; it involves an injection every 28 days or every 12 weeks. Treatment with LHRH analogues is as effective as orchiectomy, but it does not require surgical removal of the testicles. It also avoids the side effects of estrogen therapy.

Disadvantages

In a small percentage of patients, LHRH analogue therapy may cause a brief rise in cancer symptoms, such as bone pain, before the testosterone level begins to fall. This pain may be eased by the use of a pain reliever (such as aspirin or acetaminophen) or an *antiandrogen drug*, which is discussed next.

Antiandrogen therapy

This therapy involves the use of a drug that blocks the action of male hormones. Such a drug is called an antiandrogen. Antiandrogen drugs are used in combination with LHRH analogue therapy. This combination therapy is commonly known as *maximal androgen blockade* (MAB) or *combined androgen blockade* (CAB). The currently available antiandrogens are CASODEX® (bicalutamide) and Eulexin® (flutamide).

Advantages

Ongoing *clinical trials* suggest that men treated with MAB therapy live longer than men treated with LHRH analogue therapy alone. The combined use of an LHRH analogue and an antiandrogen can also be of benefit before or after prostate surgery or radiation therapy.

Disadvantages

Antiandrogens can cause diarrhea, nausea, vomiting, and liver injury.

Chemotherapy

Chemotherapy is the use of powerful toxic drugs to attack cancer cells. The drugs circulate throughout the body in the bloodstream and kill any rapidly growing cells, including healthy ones. To destroy cancer cells while minimizing the harm to healthy ones, the drugs are carefully controlled in dosage and frequency.

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Lupron is a registered trademark of TAP Pharmaceuticals.

CASODEX is a registered trademark of Zeneca Pharmaceuticals.
Eulexin is a registered trademark of Schering Corporation.

Chemotherapy is generally reserved for patients with advanced stage cancer (Stage M+) that no longer responds to hormonal therapy. Chemotherapy drugs do not work well in many men with prostate cancer.

There are many different chemotherapy drugs, each with its own strengths and weaknesses. Often the drugs are used in combination with one another. EmCyt® (estramustine phosphate) is a frequently used chemotherapy drug in prostate cancer.

Advantages

Chemotherapy drugs provide an additional means of relieving the symptoms of advanced prostate cancer.

Disadvantages

Because the drugs circulate widely throughout the body and affect healthy as well as cancerous cells, they produce many side effects. These include hair loss, nausea, vomiting, diarrhea, lowered blood counts, reduced ability of the blood to clot, and an increased risk of infection. Most of the side effects disappear when the drugs are stopped. (Hair grows back when chemotherapy is stopped.)

EmCyt is a registered trademark of Pharmacia & Upjohn.

Coping with prostate cancer

Prostate cancer can trigger many different, often confusing, emotions in a patient. Patients sometimes feel depressed and angry; feelings may change from hope to despair, from courage to fear, and then back again. Similar feelings may be experienced by family members and close friends. Such feelings are perfectly normal in people who are trying to cope with a difficult problem such as prostate cancer.

To best cope with these feelings, patients with prostate cancer should share them with family members and close friends. Sharing can ease difficult feelings. It often makes people feel more comfortable to offer one another support, and that support can be extremely helpful.

One concern may be the effect of cancer treatment on sexual activity and how others will respond. Patients may feel uncomfortable with their bodies and worry that others may reject them. Such fears often are relieved through open discussions.

Reading more about prostate cancer is another way to cope better. This booklet provides some information, but a doctor and other members of your health care team can provide more. Ask questions. Patients who get involved in their care generally cope better with their disease.

There are many brochures and booklets available that explain prostate cancer and offer suggestions on how to cope with it. You can find many of them through your public library or by contacting the following organizations.

Cancer Care, Inc.
The Prostate Cancer Education Council
1180 Avenue of the Americas
New York, NY 10036
1-800-813-HOPE
1-212-302-2400

- *Prostate Cancer: Some Good News Men Can Live With*
- *The Facts About Prostate Cancer*

Cancer Information Service
National Cancer Institute
Building 31, Room 10A16
9000 Rockville Pike
Bethesda, MD 20892
1-800-4-CANCER

- *What You Need to Know About Prostate Cancer*
- *Taking Time: Support for People With Cancer and the People Who Care About Them*
- *When Cancer Recurs: Meeting the Challenge Again*

Call your local chapter of the American Cancer Society, 1-800-ACS-2345

- *Sexuality and Cancer: For the Man Who Has Cancer and His Partner*
- *The PSA Blood Test and Prostate Cancer*
- *After Diagnosis: Prostate Cancer—Understanding Your Treatment Options*

Cancer support services

Besides your doctor and other members of the health care team, there are many people who are ready to help patients and families cope with prostate cancer. Local and national agencies can help with sexual counseling, emotional support, financial aid, home care, and transportation.

Local support groups consist of people who have cancer. Many men find it helpful to meet and talk with others who face similar problems. Sharing experiences may provide support, encouragement, and understanding.

A list of local and national support groups can be obtained from the social service office of your local hospital or clinic. If this information is not readily available, it can be obtained from one of the cancer information services listed below.

Cancer Information Service
National Cancer Institute
Building 31, Room 10A16
9000 Rockville Pike
Bethesda, MD 20892
1-800-4-CANCER

A nationwide telephone service that provides information and referrals to local and regional resources. Callers are automatically connected to the nearest Cancer Information Service office.

Cancer Care, Inc.
The Prostate Cancer Education Council
1180 Avenue of the Americas
New York, NY 10036
1-800-813-HOPE
1-212-302-2400

Provides resource information, referrals, counseling, and support to cancer patients and their families. Please call or write for information.

US TOO International, Inc.
930 North York Road, Suite 50
Hinsdale, IL 60521-2993
1-800-808-7866
1-708-323-1002
FAX: 1-708-323-1003

Provides prostate cancer survivors and their families emotional and educational support through an international network of support groups; offers literature on prostate cancer, a quarterly newsletter, and a toll-free hotline.

Prostate Health Council
American Foundation for Urologic Disease
300 W. Pratt Street, Suite 401
Baltimore, MD 21201-2463
1-800-242-2383

Provides educational information about urologic diseases and conditions to the general public and health care providers. Materials are available about prostate diseases including prostate cancer, enlarged prostate (BPH), and prostatitis. For Prostate Cancer Support Network resources, locations, and advocacy information, call 1-800-828-7866.

Definitions of medical terms

The following is a list of some medical terms that may not be familiar.

androgen (AN-dro-jen): Any hormone that produces male physical characteristics (facial hair, deep voice, etc). The main androgen hormone is testosterone.

antiandrogen drug: A drug that blocks the activity of an androgen hormone.

anticancer drug: A drug that attacks cancer cells.

anus (A-nus): The opening at the lower end of the rectum through which solid body waste is eliminated.

benign (buh-NINE): A term for a tumor that does not normally threaten a person's life (that is, a tumor that is not cancerous and does not spread to other parts of the body).

bladder: The hollow organ that stores urine.

cancer: A tumor with abnormal cells that grow and divide without control. Cancer cells can spread through the blood and lymph to other parts of the body and pose a serious threat to a person's life.

capsule: The layer of cells around an organ such as the prostate.

cells: The basic structural and functional units of the body.

chemotherapy (kee-mo-THER-a-pee): Treatment with powerful drugs that attack cancer cells, but may also harm certain types of healthy cells.

clinical trials: Studies conducted on patients with cancer or other diseases, usually to evaluate a promising new treatment. Each study is designed to answer specific questions and to find better ways to treat patients.

digital rectal examination (DIH-jih-tul): An examination performed by a physician in which a gloved, lubricated finger is inserted into the rectum to feel the prostate.

ejaculate: To eject sperm and seminal fluid.

estrogen (ES-tro-jen): A female sex hormone.

external beam radiation therapy: Radiation therapy that uses rays from a machine directed at parts of the body.

hormone therapy: In prostate cancer, treatment that interferes with the production or activity of male hormones that promote prostate tumor growth.

impotence (IM-po-tens): Inability to have an erection.

incontinence (in-KON-ti-nens): Loss of urinary control.

internal radiation therapy: Treatment with high-energy radiation from tiny radioactive seeds inserted into the prostate.

LHRH analogues (AN-a-logs): Man-made compounds that are similar to, but more potent than, natural LHRH (see definition on page 21).

luteinizing hormone (LH) (LOO-tee-ih-ni-zing): This hormone is secreted by the pituitary gland. LH stimulates the secretion of sex hormones in both men and women.

luteinizing hormone-releasing hormone (LHRH): This hormone is secreted by a part of the brain. LHRH stimulates the secretion of luteinizing hormone by the pituitary gland.

lymph (limf): A nearly clear fluid collected from tissues around the body and returned to the blood by the lymphatic system.

lymphatic system (lim-FAH-tik): Vessels that carry lymph are part of this system. Other parts include lymph nodes and several organs that produce and store infection-fighting cells.

lymph nodes: Small bean-shaped structures scattered along the vessels of the lymphatic system. The nodes filter out bacteria and cancer cells that may travel through the system.

malignant (mah-LIG-nant): A term for a tumor that can threaten a person's life—that is, a tumor that is cancerous. Malignant has the same meaning as cancerous.

metastasis (meh-TASS-tuh-sis): The spread of cancer from its original site to distant areas via blood and lymph.

oncologist (on-KAHL-o-jist): A doctor who specializes in treating cancer.

orchiectomy (or-kee-EK-toe-mee): The surgical removal of the testicles, the major source of male hormones.

pathologist (pah-THAL-o-jist): A doctor who specializes in the diagnosis of disease by studying cells and tissues with a microscope.

perineal prostatectomy (pair-in-NEE-al prah-stah-TEK-toe-mee): An operation to remove the prostate gland through a cut made in the perineum, the area between the scrotum and the anus.

pituitary gland (pih-TOO-ih-tair-ee): A gland located at the base of the brain. It produces a variety of hormones that stimulate the testicles (and other glands) to release hormones.

prostatectomy (prahs-tuh-TEK-tuh-mee): The surgical removal of the prostate gland.

prostate-specific antigen (PSA): A blood substance that often increases in cases of prostate cancer and other prostate diseases.

radiation therapy (ray-dee-AY-shun): Treatment with high-energy rays such as those from x-rays or other sources of radiation.

rectum: The last 5 or 6 inches of the intestine leading to the outside of the body.

retropubic prostatectomy (reh-tro-PYOO-bik): An operation to remove the prostate gland through a cut made in the lower abdomen.

scrotum (SKRO-tum): The external sac, or pouch, containing the testicles.

seminal vesicles (SEM-en-ull VES-i-kels): Pouches inside the body above the prostate that store semen.

stage: A term used to describe the size and extent of spread of cancer.

staging: Tests conducted to determine the stage of a cancer.

testicles (TES-ti-kuls): Two egg-shaped glands that produce sperm and sex hormones.

testosterone (tes-TOS-ter-own): A male sex hormone produced chiefly by the testicles. Testosterone stimulates a man's sexual activity and the growth of other sex organs, including the prostate.

tissue: A group of cells organized to perform a specialized function.

transrectal ultrasonography (trans-RECK-tul ul-tra-son-OG-raff-ee): Using sound waves produced by a device inserted into the rectum to produce a picture of the prostate.

transurethral resection of the prostate (trans-yu-REETH-ral): The use of a special instrument inserted through the urethra in the penis to remove noncancerous prostate tissue. Also called TUR or TURP.

tumor (TOO-mer): An excessive growth of cells resulting from uncontrolled and disorderly cell replacement.

ureter (YUR-e-ter): The tube that carries urine from each kidney to the bladder.

urethra (yu-REETH-rah): The tube running through the penis to the outside of the body. It carries urine from the bladder and semen from the sex glands.

urologist (yer-AHL-o-jist): A doctor who specializes in diseases of the male sex organs and in diseases of the urinary organs in both men and women.

watchful waiting: When a prostate cancer is simply watched by the doctor using regular digital rectal examinations and blood tests.

Notes or questions to discuss with your doctor.

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