

Localized Prostate Cancer

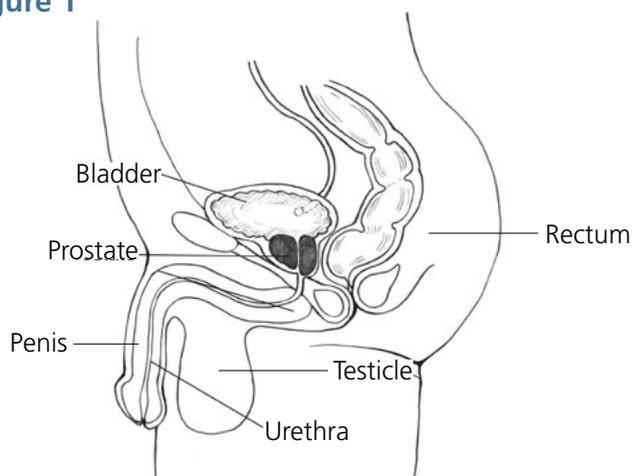


What is the Prostate?

The **prostate*** is part of the male reproductive system. It is about the same size as a walnut and weighs about an ounce. As pictured in Figure 1, the prostate is below the **bladder** and in front of the **rectum**. The prostate goes all the way around a tube called the **urethra**. The urethra carries urine from the bladder out through the penis. The main job of the prostate is to make fluid for **semen**. During **ejaculation**, **sperm** made in the **testicles** moves to the urethra. At the same time, fluid from the prostate and the **seminal vesicles** also moves into the urethra. This mixture—semen—goes through the urethra and out the penis.

As a man ages, his chance of having prostate cancer increases. Prostate cancer is the second most common type of cancer found in American men. It is the second leading cause of cancer death among American men. However, with advancements in cancer screening and treatment, the death rate for prostate cancer is going down.

Figure 1



What is Localized Prostate Cancer?

Localized prostate cancer is cancer that has not moved outside of the prostate. If the cancer has moved to other parts of the body, it is harder to treat. The chance of dying from the cancer then increases.

*All words in bold are explained in the glossary, at the end of this guide.

Many newly found prostate tumors are confined in the prostate. If not treated, localized tumors can grow and spread to other parts of the body (metastasize). Some prostate cancer tumors grow very fast but most tumors grow very slowly over many years. As a result, an 80-year old man with slow growing, localized prostate cancer may be likely to die *with* prostate cancer, not *of* prostate cancer.

What are the Symptoms of Localized Prostate Cancer?

As men grow older, they may have urinary symptoms of aging. These can include slowing of the urinary stream and more trips to the bathroom, both day and night. This does not mean that they have prostate cancer. In its early stages, only a few men may have symptoms, such as urinary problems or pain, from prostate cancer. Because there are no warning signs of localized prostate cancer, **screening tests** that find (detect) cancer early are used by many doctors in the United States.

There are two tests used to find prostate cancer. One is the **digital rectal examination (DRE)**. The other is a blood test for **prostate-specific antigen (PSA)**. A DRE is a physical exam by a doctor using a lubricated, gloved finger. The finger is placed into the rectum so that the doctor can feel the surface of the prostate (Figure 2). The area of the prostate next to the rectum is where tumors often grow. If the prostate has a hard spot or feels uneven, it may be a sign of prostate cancer.

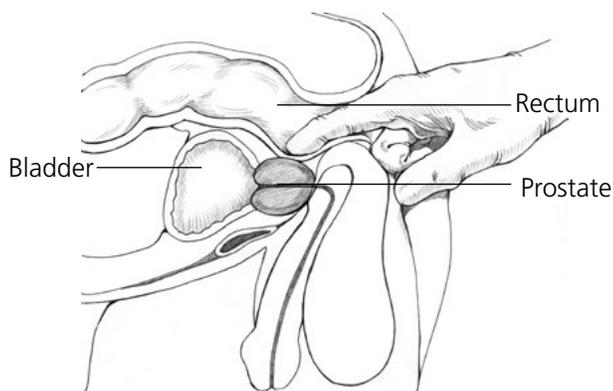
How do They Screen for Prostate Cancer?

PSA is a protein made by cells inside the prostate. In men, PSA can be found in blood. A healthy prostate does not release very much PSA, so a higher blood PSA level may be a warning of prostate cancer. The PSA can be higher for other reasons, such as a **benign** (noncancerous) growth of the prostate or because of urinary or prostate infection. Low blood PSA level does not always mean that there is no prostate cancer.

Many early stage prostate cancers can begin to grow with quite low levels of PSA. Today, a PSA test that shows higher levels is the number one reason why prostate cancer is detected in the United States. This testing has helped doctors find and treat many prostate cancers that otherwise might not have been detected.

Even when there is a concern about prostate cancer, a **biopsy** is needed to prove it. During the procedure, several small bits of tissue are taken from the prostate with a needle. A **transrectal ultrasound (TRUS)** is usually used to guide the needle during the biopsy. The **pathologist** is an expert who studies changes in body tissues caused by diseases. After the biopsy, the pathologist looks at the prostate tissue samples under a microscope to determine if there is cancer. Many men who have a biopsy do not have cancer. Serious **complications** after a biopsy are rare. Sometimes an infection or rectal bleeding can occur.

Figure 2



What is Tumor Grade?

If prostate cancer is found, the pathologist gives it a grade. The grade is a measure of how quickly the tumor is likely to grow and spread. The most common grading system is called the Gleason score. These scores range from 2 to 10. To determine the grade of a tumor, the pathologist scores each bit of tissue from the biopsy and then adds the two most common values together to determine the Gleason score. Although a score of 2 to 4 shows low **aggressiveness**, these numbers are almost never seen following a biopsy. The lowest score that is usually found is 5; as a result, that is the least aggressive score. A Gleason score of 6 is more aggressive. Gleason 7 tumors show even higher aggressiveness. These scores come in two varieties. A 4+3 tumor is more aggressive than a 3+4 tumor because more of the higher aggressive grade tumor was found. Gleason 8, 9 and 10 tumors are the most aggressive. These usually have already spread by the time they are found (Figure 3). Talk to your doctor about your Gleason score.

What is Tumor Stage?

Tumor stage shows the size and spread of the cancer. As with other tumors, cancer that involves only a small part of the prostate has a better chance of being treatable than cancer that has spread all through the gland. Likewise, tumors found only in the prostate are more successfully treated than those that have spread outside the prostate (metastasized). Finally, tumors that have spread to places far from the prostate such as to the **lymph nodes** or bone have the poorest results.

The system used for tumor staging is the TNM system (Figure 4), which stands for **Tumor**, **Nodes** and **Metastasis**. Using the "T" part of the system, localized prostate cancer is staged as T1a-c, which means that the exam of the prostate by DRE is normal. A T2a-c staging means that the DRE is not normal but that there is no sign of cancer outside of the prostate. With an N0 stage, there is no sign of the cancer moving to the lymph nodes in the area of the prostate. In the M0 stage, there is no sign of tumor **metastasis**. If the cancer is spreading to the lymph node or if the tumor has spread to other parts of the body, the stage is changed to either N1, for node, and/or M1, for metastasis.

Figure 3

The Gleason Scale

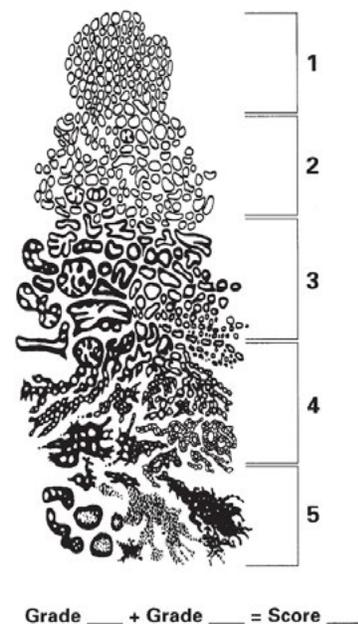


Image courtesy of University of Kansas Medical Center

Figure 4. Tumor Staging

TNM (Tumor, Nodes, Metastasis) Prostate Cancer Staging System

TNM	Stage	Description
Tumor (T)	TX	Tumor cannot be assessed
	T0	No evidence of tumor
	T1	Clinically unapparent tumor not detected by physical exam (DRE) or visible by imaging
	T1a	Tumor found incidentally in tissue removed from prostate for other reasons, histologic finding in <5% of tissue resected
	T1b	Tumor found incidentally in tissue removed from prostate for other reasons, histologic finding in >5% of tissue resected
	T1c	Tumor identified by needle biopsy because of elevated PSA
	T2	Tumor confined within the prostate
	T2a	Tumor involves 50% of one lobe or less
	T2b	Tumor involves >50% of one lobe but not both lobes
	T2c	Tumor involves both lobes
	T3	Tumor extends outside the prostate capsule
	T3a	Extracapsular extension (unilateral or bilateral)
	T3b	Tumor invades the seminal vesicles
	T4	Tumor invades nearby structures other than the seminal vesicles, such as the bladder or rectum
Regional Lymph Nodes (N)	NX	Regional lymph nodes were not assessed
	N0	No spread to nearby lymph nodes
	N1	Metastasis in nearby lymph node(s)
Distant Metastasis (M)	MX	Distant metastasis cannot be assessed (not evaluated)
	M0	No distant metastasis
	M1	Distant Metastasis
	M1a	Lymph node(s) outside of nearby area
	M1b	Bone(s)
M1c	Other site(s) with or without bone disease	
Histopathologic Grade (G)	GX	Grade cannot be assessed
	G1	Gleason 2-4
	G2	Gleason 5-6
	G3-4	Gleason 7-10

Prostate Cancer Stage Groupings

Stage I	T1a, N0, M0, G1
Stage II	T1a, N0, M0, G2-4
	T1b, N0, M0, any G
	T1, N0, M0, any G
	T2, N0, M0, any G
Stage III	T3, N0, M0, any G
Stage IV	T4, N0, M0, any G
	Any T, N1, M0, any G
	Any T, any N, M1, any G

What Should I Consider When Choosing a Treatment?

Four things are very important when choosing a treatment for prostate cancer. These are how long a life you are expected to live (**life expectancy**), your overall health status, the tumor's characteristics (as discussed above) and your values or personal preferences:

- **Life Expectancy: How long are you expected to live?**

Life expectancy, rather than patient age, is important to keep in mind when choosing a treatment. When a man's life expectancy is quite long, localized prostate cancer may cause illness and death. In the later years or when he has other serious diseases, the chance that a man's cancer will get worse or that he will die from prostate cancer is less.

- **Overall Health Status: What other health problems do you have?**

Overall health status includes your health history and your family health history. It also includes your current health and the seriousness of any other diseases you may have. Overall health influences how long a man will live. For some men, their overall health may influence the risk of problems they may experience with some prostate cancer treatments. Urinary, sexual and bowel functions may be affected by certain treatments in some men more than others.

- **Values or Personal Preferences: What is important to you?**

Each man has different priorities when deciding whether to be treated for his prostate cancer. If he wishes to be treated, he also may have different values when choosing the best treatment. Some men want their cancer removed, no matter how old they are or what grade or stage their tumor is. They are willing to face the complications of the treatments for the chance of a cure. Others are worried about how certain treatments could affect the quality of their lives. Their choice may be made in order to avoid certain complications. Each man's personal values, when discussed with his family members, are the most important issues in choosing a treatment.

What are the Treatment Choices for Localized Prostate Cancer?

The three usual treatments for localized prostate cancer are **active surveillance** (also known as **watchful waiting**), **radiation therapy** and surgery. There is no information that shows one treatment is clearly better than the others. In men with aggressive cancer, the chance that the tumor will return is high even with any one of these treatments.

Active surveillance or watchful waiting is based on the fact that some prostate cancers may never become life threatening. With these approaches, PSA and a DRE are checked and prostate biopsies may be done on a regular basis. Other treatments can be started at any time if the cancer shows signs of growth or of becoming a more aggressive tumor. For watchful waiting and active surveillance, the timing of check-ups and visits to the doctor will be different for each man with prostate cancer.

The second choice, radiation therapy, includes two types: **interstitial prostate brachytherapy** and **external beam radiation therapy**. With interstitial prostate brachytherapy, small radioactive "seeds" are planted in the prostate. Before treatment, the size (volume) of the prostate is checked by TRUS to decide the dosage of seeds. These seeds are then placed into the prostate using needles that go through the skin between the scrotum and anus. With external beam radiation therapy, the prostate and other important tissues are treated with a carefully targeted beam of radiation. Two studies have shown that higher-than-normal doses of external beam radiation may lower the chance of increases in PSA levels in some men. Both radiation therapies (seeds and beam) can be combined with one another. In some patients, the combination of hormone therapy and external beam radiation may lower the risk of cancer death.

The third choice, **radical prostatectomy**, is an operation that removes the prostate. The term “radical” means that the entire prostate and nearby tissues are removed through surgery.

Other treatments, such as **hormonal therapy** and **cryotherapy**, have been used for the treatment of localized prostate cancer, but it is not known how well these treatments work. While hormonal therapy may lessen the cancer symptoms in men who choose not to or who cannot be treated with other therapies, it makes heart disease and diabetes worse in those who have these diseases. Cryotherapy uses gases to freeze and then thaw the prostate. New forms of therapy are being tested in studies, and some include a combination of therapies. Men are urged to talk to their doctors about joining these studies to see if they could help treat their localized prostate cancer.

What are the Benefits and Risks of Each Treatment?

Watchful Waiting/Active Surveillance

Managing localized prostate cancer with regular exams but no treatment has two main advantages – a low cost and no immediate complications. Watchful waiting may be a personal choice or a choice because a man has a shorter life expectancy and wants to avoid possible problems with treatment. Active surveillance may be a good choice for a man with a longer life expectancy and a low-risk tumor. These men usually have a lower Gleason score, PSA level and clinical stage. Medical studies show that a man with localized, low-grade prostate cancer has a lower chance of the tumor growing within the first 10 years after it has been found.

The main disadvantage of watchful waiting and active surveillance is that over time the cancer could become worse and even untreatable. The signs of cancer getting worse and the exact time to start treatment are not always known. If the cancer spreads outside the prostate during the time between check-ups, there is a good chance that it may not be able to be cured. When prostate cancer spreads, it often spreads into the bones. This is painful and can prevent a man from participating in his normal daily activities and affect his quality of life before he dies.

Radiation Therapy and Radical Prostatectomy

The benefit of these therapies is that with their use prostate cancer may be cured. The complications most often seen with their use are **urinary incontinence** (urine leakage) and other urinary symptoms. Radiation and prostatectomy can also cause blood in the urine, stomach and bowel problems, rectal problems such as bleeding and discomfort, or pain. Some men will have **erectile dysfunction** (erections that are not strong enough for intercourse). Each form of therapy has its own set of complications. None of the choices for therapy has shown a better or worse chance of complications.

Radiation Therapy

The advantage of radiation therapy is that it is less invasive than surgery. Urinary incontinence and erectile dysfunction may happen less often with radiation than with radical prostatectomy. However, one disadvantage of radiation therapy is that it leaves the prostate in the body. It is possible for some cancer to remain and worsen in the future. Although today’s new methods cause less harm to normal surrounding tissues from the radiation, a man may experience bowel, urinary tract and genital tract complications.

Interstitial Prostate Brachytherapy

Interstitial prostate brachytherapy is a therapy that places radiation seeds throughout the prostate. The advantage of **brachytherapy** is that it is a single-day treatment. However, it does require an **anesthetic** while the seeds are placed. Gastro-intestinal problems are the complications most often reported. Erectile dysfunction and urinary incontinence occur less often than with other treatments. Urinary problems other than **incontinence** also occur, but not in most men. Blood in the urine is a usual problem soon after the seeds are placed. In one study, all the men had blood in their urine in the 12- to 48-hours after the seeds were placed but almost none had blood in their urine after six weeks.

External Beam Radiotherapy

External beam radiotherapy carefully directs radiation at the prostate to kill only the cancer cells. No surgery or anesthetic is required. Each radiation treatment lasts only minutes. They are done once a day, five days a week for seven to eight weeks. With today’s new methods of this treatment, the needed radiation to the prostate can be given while nearby structures such as the bladder and rectum receive only small amounts. In men who have had bowel diseases such as **Crohn’s disease** or **ulcerative colitis** or have received radiation to their pelvis, external beam radiotherapy may be a poor choice for treatment.

Questions to Ask My Doctor

Like interstitial prostate brachytherapy, external beam radiotherapy causes gastrointestinal problems. Diarrhea and loose stools are the most frequent complications. Erectile dysfunction and urinary incontinence are also reported but less often. **Irritative urinary tract symptoms** (burning on passing urine or sudden need to urinate) are usual problems reported by men right after external beam radiotherapy. This will usually go away within one or two years. Rectal pain, which has been reported by patients in the year following external beam radiotherapy treatment, lessens over time. Blood in the urine (bleeding) seems to be uncommon.

Radical Prostatectomy

Radical prostatectomy is an operation in which the prostate is taken out. The surgery requires an anesthetic, and the patient will be in the hospital for one to three days and then sent home with a urinary drainage tube (a **catheter**) in his bladder. The tube will be removed after one to two weeks. The main benefit of this operation is that it may remove all of the cancer. However, if the cancer has already spread, then removing the prostate may not cure all of the cancer. Still, treatment by radical prostatectomy offers the man with cancer that has not spread outside the prostate the possibility of freedom from the disease for the rest of his life.

The main disadvantage of radical prostatectomy is the chance of complications from the operation itself. Erectile dysfunction and urinary incontinence are the problems reported most often. The chance of having erectile dysfunction depends on a man's age and health, his sexual function before treatment, the stage of the cancer, and the ability to save the nerves that control erection during the surgery. Younger men (those under 60 years of age) are less likely to have problems with their erections than are older men. Even if erectile dysfunction does occur after surgery, erections may return to normal over time. There are also medications and devices to treat the problem that may be helpful. You may wish to ask your doctor about the treatments for erectile dysfunction or other complications.

Urinary incontinence after radical prostatectomy usually lessens or stops with time. Other problems that are reported by patients after radical prostatectomy include: irritation of the bladder, gastrointestinal symptoms, bladder infection, blockage of the urine flow from the bladder and leaking of urine. Sometimes scarring can occur and scar tissue may form in the bladder and urinary tract, changing the flow of urine. If a man's urine flow is blocked, though, more surgery may be needed to clear the blockage.

- How far along is my prostate cancer?
- What is its stage? (How far does it seem to have spread?)
- What is my cancer's grade? (How fast is it likely to spread?)
- Is my chance of cancer spread high? If so, do I need more testing? What are the recommendations about more testing?
- Do I need a second opinion?
- What are my treatment choices (including watchful waiting and active surveillance)? What are the advantages and disadvantages of each?
- What are the chances for each treatment to cure my cancer?
- What are the chances of complications from each treatment? What kinds of complications are likely from each?
- How are the complications themselves treated—for example, urinary incontinence or erectile dysfunction?
- How much will each prostate cancer treatment cost?
- How much will treating possible complications cost?
- If I choose an operation, how many days will I be in the hospital?
- How long will I have a catheter after the operation?
- How much time will I need to fully recover?
- If I choose radiation therapy, how much time will be required?
- Will I need to take time off from work or other activities?
- What is likely to happen if I choose no treatment (watchful waiting or active surveillance)? How frequently will I need examinations?
- Following treatment, how often will I need examinations?

Glossary

Active surveillance

Treatment approach where tests, such as PSA and a DRE, are checked and prostate biopsies are done on a regular basis. Also called “watchful waiting.”

Aggressiveness

Rapid tumor spread within the prostate and outside the prostate.

Anesthetic

A substance (drug or gas) which produces a local or general loss of feeling, including pain.

Benign

A tumor that will not spread to other parts of the body.

Biopsy

Procedure to take out small bits of prostate tissue (cores) for testing.

Bladder

The balloon-shaped pouch of thin, flexible muscle in which urine is temporarily stored before being discharged through the urethra.

Brachytherapy

Treatment for prostate cancer that involves the placement of tiny radioactive pellets (or “seeds”) into the prostate by utilizing ultrasound.

Catheter

A thin tube that is inserted through the urethra into the bladder to allow urine to drain.

Complications

A problem that occurs because of a treatment.

Crohn’s disease

A disease of the bowel that causes pain, rectal bleeding, diarrhea and weight loss.

Cryotherapy

During an operation, probes are placed in the prostate. The probes freeze the prostate, thus killing abnormal prostate cells.

Digital rectal exam (DRE)

Insertion of a gloved, lubricated finger into the rectum to feel the prostate and check for any abnormalities.

Ejaculation

Release of semen from the penis during sexual climax (orgasm).

Erectile dysfunction (ED)

(also known as impotence) Erection problems. The inability to get or maintain an erection for satisfactory sexual intercourse.

External beam radiation therapy

A method for delivering a beam of high-energy X-rays to the location of the patient’s prostate tumor. The beam is generated outside the patient and is targeted at the tumor site. These X-rays can destroy the cancer cells and careful treatment planning allows the surrounding normal tissues to be spared. No radioactive sources are placed inside the patient’s body.

Hormonal therapy

Treatments that add, block or remove hormones.

Incontinence

Loss of bladder or bowel control; urine leakage (urinary incontinence) or uncontrolled loss of stool (fecal incontinence).

Interstitial prostate brachytherapy

Radiotherapy in which radioactive material is placed directly in the prostate.

Irritative urinary symptoms

Symptoms that result in a limited capacity to store urine in the bladder. Symptoms include frequent and urgent urination.

Life expectancy

Measure of time, usually in years or months that estimates how long a person will live.

Localized prostate cancer

Cancer that has not moved outside of the prostate.

Glossary

Lymph nodes

Small rounded masses of tissue distributed along the lymphatic system most prominently in the armpit, neck and groin areas. Lymph nodes produce special cells that help fight off foreign agents invading the body. Lymph nodes also act as traps for infectious agents.

Malignant

Cancerous.

Metastasis

The spread of cancer from the first place that the cancer grew to another part of the body.

Pathologist

A doctor trained to study body tissues and to diagnose conditions.

Prostate

In men, a walnut-shaped gland that goes around the urethra at the neck of the urinary bladder. The prostate supplies fluid that goes into semen.

Prostate-specific antigen (PSA)

Also referred to as prostate-specific antigen. A protein made only by the prostate gland. High levels of PSA in the blood may be a sign of prostate cancer.

Radiation therapy

The treatment of disease (especially cancer) by exposure to a radioactive substance. High-energy rays are often used to damage cancer cells and stop them from growing and dividing. Includes interstitial prostate brachytherapy and external beam radiation therapy.

Radical prostatectomy

Surgical procedure for the removal of the prostate.

Rectum

The lower part of the large intestine, ending in the anal opening.

Screening tests

Tests that check for a disease when there are no symptoms. Since screening may find diseases at an early stage, there may be a better chance of curing the disease or preventing complications from the disease.

Semen

Also known as seminal fluid or ejaculate fluid. Thick, whitish fluid produced by glands of the male reproductive system that carries the sperm (reproductive cells) through the penis during ejaculation.

Seminal vesicles

An internal structure in the male located behind the bladder and above the prostate gland. It contributes fluid to semen.

Sperm

Male reproductive cells made in the testicles.

Testicles

Paired, egg-shaped glands located in a pouch (scrotum) below the penis. They produce sperm and the male hormone testosterone.

Transrectal ultrasound (TRUS)

A special ultrasound test in which sound waves are produced by a probe inserted into the rectum. In men, the structures most commonly examined with this test are the prostate, bladder, seminal vesicles and ejaculatory ducts.

Ulcerative colitis

A disease that causes ulcers in the bowel and has symptoms of pain, rectal bleeding, diarrhea and weight loss.

Ultrasound

A tool that makes images by using sound waves to picture internal structures.

Urethra

In males, this narrow tube carries urine from the bladder to the outside of the body and also serves as the channel through which semen is ejaculated. Extends from the bladder to the tip of the penis.

Urinary incontinence

Urine leakage.

Watchful waiting

See "active surveillance."

Where Can I Find Additional Prostate Cancer Resources?

For more information about prostate cancer, visit UrologyHealth.org/ProstateCancer and visit our prostate cancer awareness campaign at KnowYourStats.org. For more information on other urologic conditions, please visit the Urology Care Foundation's website, UrologyHealth.org.

About the Urology Care Foundation

The Urology Care Foundation is committed to advancing urologic research and education. We collaborate with researchers, health care professionals, patients and caregivers to improve patients' lives. The Urology Care Foundation is the official foundation of the American Urological Association (AUA).

The Urology Care Foundation provides this information based on current medical and scientific knowledge. This information is not a tool for self-diagnosis or a substitute for professional medical advice. It is not to be used or relied on for that purpose. Please see your urologist or other healthcare provider regarding any health concerns and always consult a health care professional before you start or stop any treatments, including medications.

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