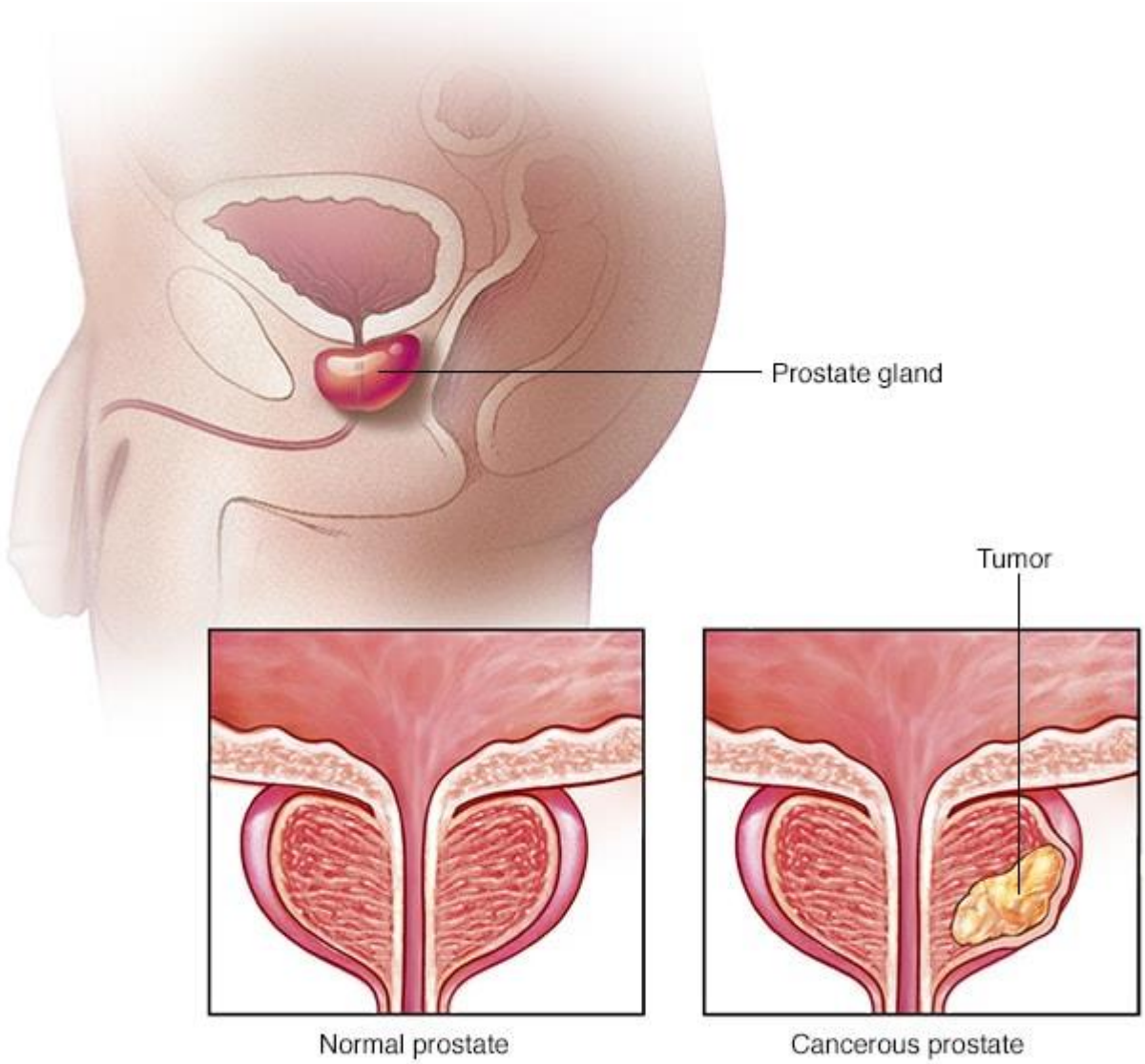
Prostate Cancer

- **Screening**
- **Diagnosis**
- **Medical Management**
- **Bilateral Orchiectomy**

Overview



Prostate cancer

Prostate cancer is cancer that occurs in the prostate. The prostate is a small walnut-shaped gland in males that produces the seminal fluid that nourishes and transports sperm.

Prostate cancer is one of the most common types of cancer. Many prostate cancers grow slowly and are confined to the prostate gland, where they may not cause serious harm. However, while some types of prostate cancer grow slowly and may need minimal or even no treatment, other types are aggressive and can spread quickly.

Prostate cancer that's detected early — when it's still confined to the prostate gland — has the best chance for successful treatment.

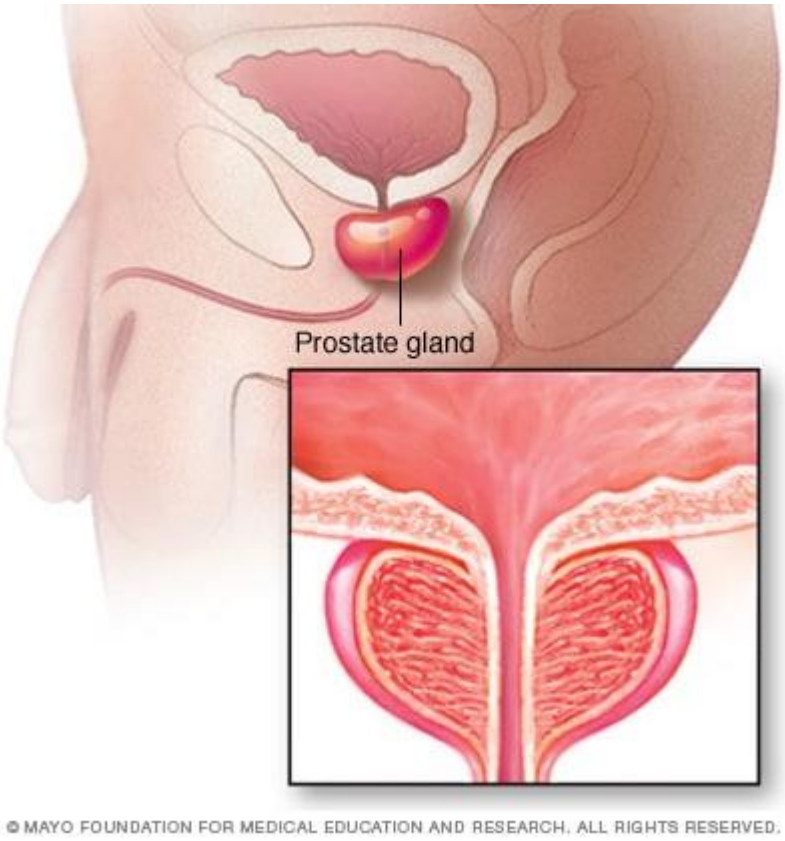
Symptoms

Prostate cancer may cause no signs or symptoms in its early stages.

Prostate cancer that's more advanced may cause signs and symptoms such as:

- Trouble urinating
- Decreased force in the stream of urine
- Blood in the urine
- Blood in the semen
- Bone pain
- Losing weight without trying
- Erectile dysfunction

Causes



Prostate gland

It's not clear what causes prostate cancer.

Doctors know that prostate cancer begins when cells in the prostate develop changes in their DNA. A cell's DNA contains the instructions that tell a cell what to do. The changes tell the cells to grow and divide more rapidly than normal cells do. The abnormal cells continue living, when other cells would die.

The accumulating abnormal cells form a tumor that can grow to invade nearby tissue. In time, some abnormal cells can break away and spread (metastasize) to other parts of the body.

Risk factors

Factors that can increase your risk of prostate cancer include:

- **Older age.** Your risk of prostate cancer increases as you age. It's most common after age 50.

- **Race.** For reasons not yet determined, Black people have a greater risk of prostate cancer than do people of other races. In Black people, prostate cancer is also more likely to be aggressive or advanced.
- **Family history.** If a blood relative, such as a parent, sibling or child, has been diagnosed with prostate cancer, your risk may be increased. Also, if you have a family history of genes that increase the risk of breast cancer (BRCA1 or BRCA2) or a very strong family history of breast cancer, your risk of prostate cancer may be higher.
- **Obesity.** People who are obese may have a higher risk of prostate cancer compared with people considered to have a healthy weight, though studies have had mixed results. In obese people, the cancer is more likely to be more aggressive and more likely to return after initial treatment.

Complications

Complications of prostate cancer and its treatments include:

- **Cancer that spreads (metastasizes).** Prostate cancer can spread to nearby organs, such as your bladder, or travel through your bloodstream or lymphatic system to your bones or other organs. Prostate cancer that spreads to the bones can cause pain and broken bones. Once prostate cancer has spread to other areas of the body, it may still respond to treatment and may be controlled, but it's unlikely to be cured.
- **Incontinence.** Both prostate cancer and its treatment can cause urinary incontinence. Treatment for incontinence depends on the type you have, how severe it is and the likelihood it will improve over time. Treatment options may include medications, catheters and surgery.
- **Erectile dysfunction.** Erectile dysfunction can result from prostate cancer or its treatment, including surgery, radiation or hormone treatments. Medications, vacuum devices that assist in achieving erection and surgery are available to treat erectile dysfunction.

Prevention

You can reduce your risk of prostate cancer if you:

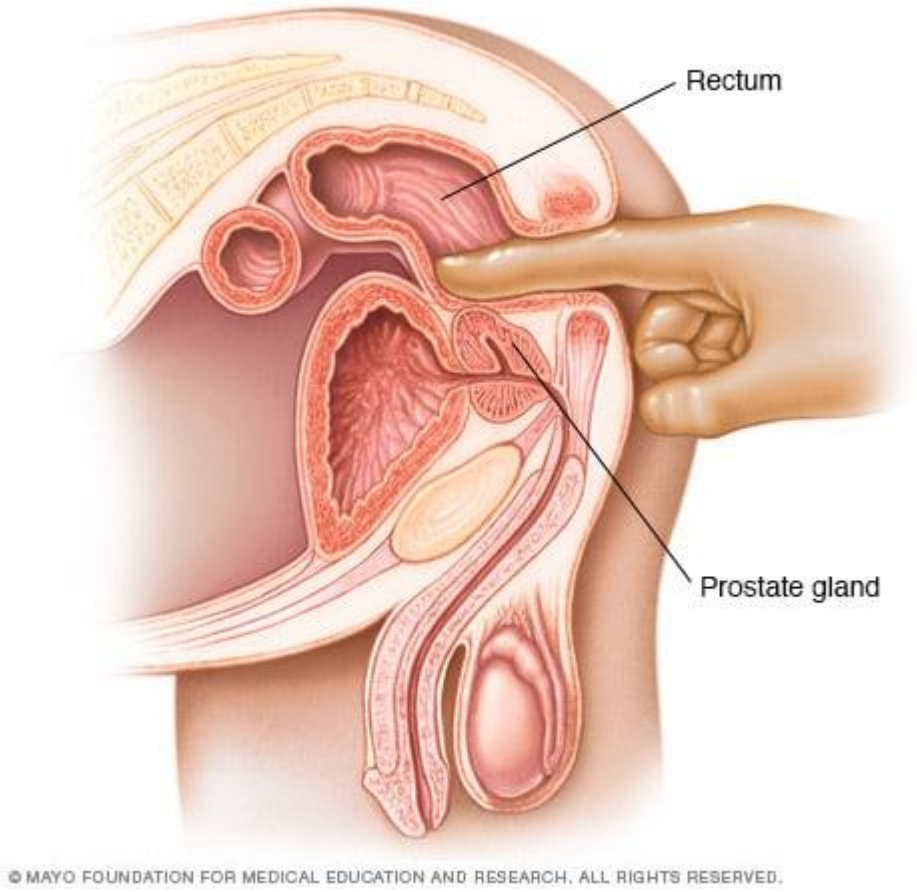
- **Choose a healthy diet full of fruits and vegetables.** Eat a variety of fruits, vegetables and whole grains. Fruits and vegetables contain many vitamins and nutrients that can contribute to your health.

  Whether you can prevent prostate cancer through diet has yet to be conclusively proved. But eating a healthy diet with a variety of fruits and vegetables can improve your overall health.

- **Choose healthy foods over supplements.** No studies have shown that supplements play a role in reducing your risk of prostate cancer. Instead, choose foods that are rich in vitamins and minerals so that you can maintain healthy levels of vitamins in your body.
- **Exercise most days of the week.** Exercise improves your overall health; helps you maintain your weight and improves your mood. Try to exercise most days of the week. If you're new to exercise, start slow and work your way up to more exercise time each day.
- **Maintain a healthy weight.** If your current weight is healthy, work to maintain it by choosing a healthy diet and exercising most days of the week. If you need to lose weight, add more exercise and reduce the number of calories you eat each day. Ask your doctor for help creating a plan for healthy weight loss.
- **Talk to your doctor about increased risk of prostate cancer.** If you have a very high risk of prostate cancer, you and your doctor may consider medications or other treatments to reduce the risk. Some studies suggest that taking 5-alpha reductase inhibitors, including finasteride (Propecia, Proscar) and dutasteride (Avodart), may reduce the overall risk of developing prostate cancer. These drugs are used to control prostate gland enlargement and hair loss.

  However, some evidence indicates that people taking these medications may have an increased risk of getting a more serious form of prostate cancer (high-grade prostate cancer). If you're concerned about your risk of developing prostate cancer, talk with your doctor.

Screening for prostate cancer



Digital rectal exam

Testing healthy men with no symptoms for prostate cancer is controversial. There is some disagreement among medical organizations whether the benefits of testing outweigh the potential risks.

Most medical organizations encourage men in their 50s to discuss the pros and cons of prostate cancer screening with their doctors. The discussion should include a review of your risk factors and your preferences about screening.

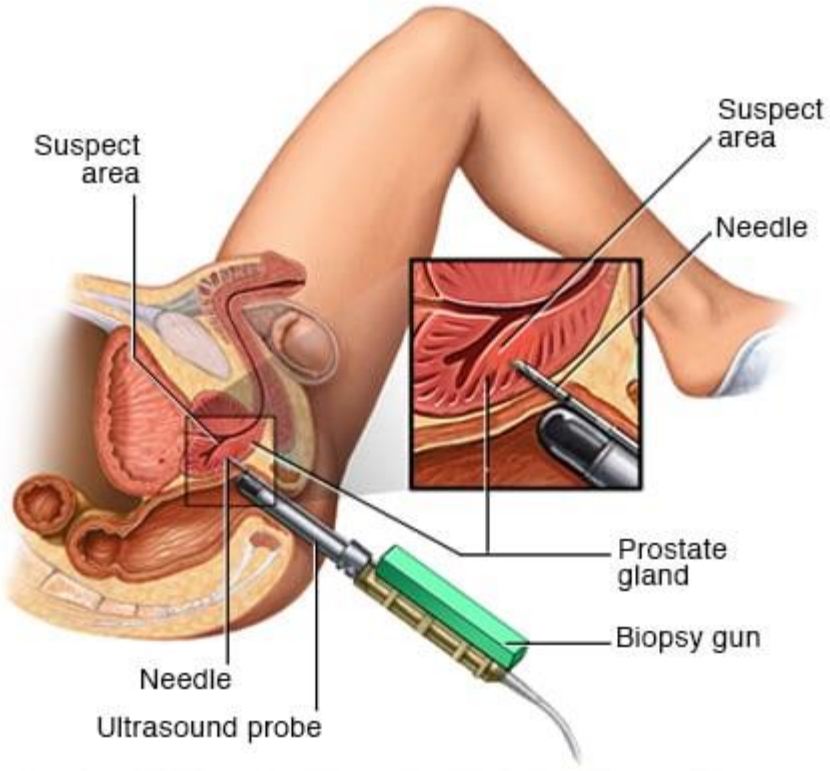
You might consider starting the discussions sooner if you're a Black person, have a family history of prostate cancer or have other risk factors.

Prostate screening tests might include:

- **Digital rectal exam (DRE).** During a DRE, your doctor inserts a gloved, lubricated finger into your rectum to examine your prostate, which is adjacent to the rectum. If your doctor finds any abnormalities in the texture, shape or size of the gland, you may need further tests.

- **Prostate-specific antigen (PSA) test.** A blood sample is drawn from a vein in your arm and analyzed for PSA, a substance that's naturally produced by your prostate gland. It's normal for a small amount of PSA to be in your bloodstream. However, if a higher than usual level is found, it may indicate prostate infection, inflammation, enlargement or cancer.

Diagnosing prostate cancer



Transrectal biopsy of the prostate

If prostate cancer screening detects an abnormality, your doctor may recommend further tests to determine whether you have prostate cancer, such as:

- **Ultrasound.** During a transrectal ultrasound, a small probe, about the size and shape of a cigar, is inserted into your rectum. The probe uses sound waves to create a picture of your prostate gland.
- **Magnetic resonance imaging (MRI).** In some situations, your doctor may recommend an MRI scan of the prostate to create a more detailed picture. MRI images may help your doctor plan a procedure to remove prostate tissue samples.

- **Collecting a sample of prostate tissue.** To determine whether there are cancer cells in the prostate, your doctor may recommend a procedure to collect a sample of cells from your prostate (prostate biopsy). Prostate biopsy is often done using a thin needle that's inserted into the prostate to collect tissue. The tissue sample is analyzed in a lab to determine whether cancer cells are present.

Determining whether prostate cancer is aggressive

When a biopsy confirms the presence of cancer, the next step is to determine the level of aggressiveness (grade) of the cancer cells. A doctor in a lab examines a sample of your cancer cells to determine how much cancer cells differ from the healthy cells. A higher grade indicates a more aggressive cancer that is more likely to spread quickly.

Techniques used to determine the aggressiveness of the cancer include:

- **Gleason score.** The most common scale used to evaluate the grade of prostate cancer cells is called a Gleason score. Gleason scoring combines two numbers and can range from 2 (nonaggressive cancer) to 10 (very aggressive cancer), though the lower part of the range isn't used as often.

  Most Gleason scores used to assess prostate biopsy samples range from 6 to 10. A score of 6 indicates a low-grade prostate cancer. A score of 7 indicates a medium-grade prostate cancer. Scores from 8 to 10 indicate high-grade cancers.

- **Genomic testing.** Genomic testing analyzes your prostate cancer cells to determine which gene mutations are present. This type of test can give you more information about your prognosis. But it's not clear who might benefit most from this information, so the tests aren't widely used. Genomic tests aren't necessary for every person with prostate cancer, but they might provide more information for making treatment decisions in certain situations.

Determining whether the cancer has spread

Once a prostate cancer diagnosis has been made, your doctor works to determine the extent (stage) of the cancer. If your doctor suspects your cancer may have

spread beyond your prostate, one or more of the following imaging tests may be recommended:

- Bone scan
- Ultrasound
- Computerized tomography (CT) scan
- Magnetic resonance imaging (MRI)
- Positron emission tomography (PET) scan

Not every person should have every test. Your doctor will help determine which tests are best for your individual situation.

Your doctor uses the information from these tests to assign your cancer a stage. Prostate cancer stages are indicated by Roman numerals ranging from I to IV. The lowest stages indicate the cancer is confined to the prostate. By stage IV, the cancer has grown beyond the prostate and may have spread to other areas of the body.

Treatment

Your prostate cancer treatment options depend on several factors, such as how fast your cancer is growing, whether it has spread and your overall health, as well as the potential benefits or side effects of the treatment.

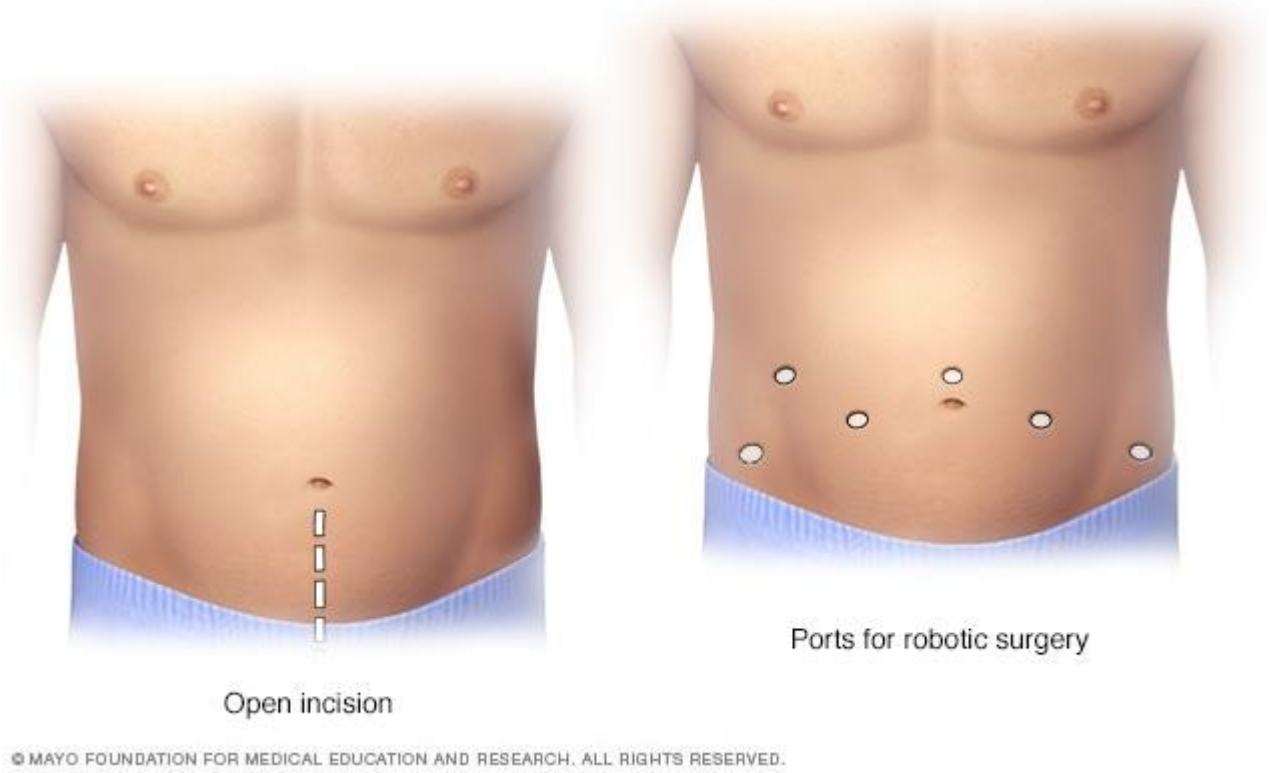
Immediate treatment may not be necessary

Low-grade prostate cancer may not need treatment right away. For some, treatment may never be needed. Instead, doctors sometimes recommend active surveillance.

In active surveillance, regular follow-up blood tests, rectal exams and prostate biopsies may be performed to monitor progression of your cancer. If tests show your cancer is progressing, you may opt for a prostate cancer treatment such as surgery or radiation.

Active surveillance may be an option for cancer that isn't causing symptoms, is expected to grow very slowly and is confined to a small area of the prostate. Active surveillance may also be considered for someone who has another serious health condition or who is of an advanced age that makes cancer treatment more difficult.

Surgery to remove the prostate



Prostatectomy incisions

Surgery for prostate cancer involves removing the prostate gland (radical prostatectomy), some surrounding tissue and a few lymph nodes.

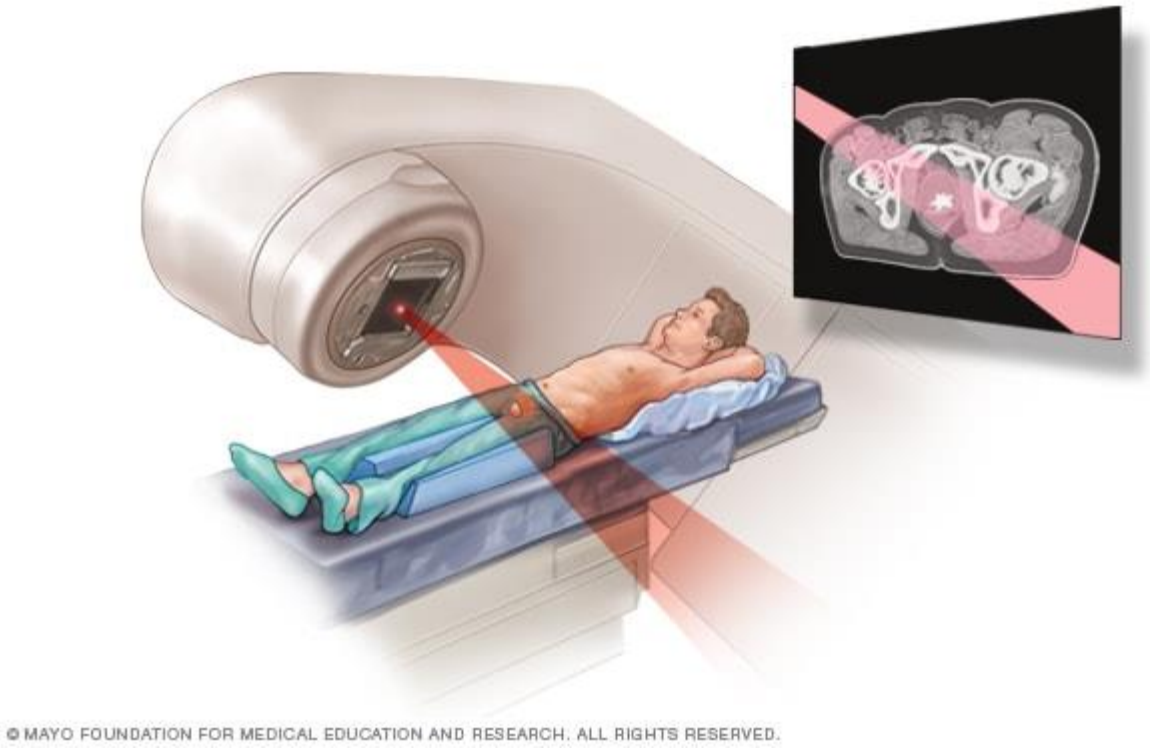
Surgery is an option for treating cancer that's confined to the prostate. It's sometimes used to treat advanced prostate cancer in combination with other treatments.

To access the prostate, surgeons may use a technique that involves:

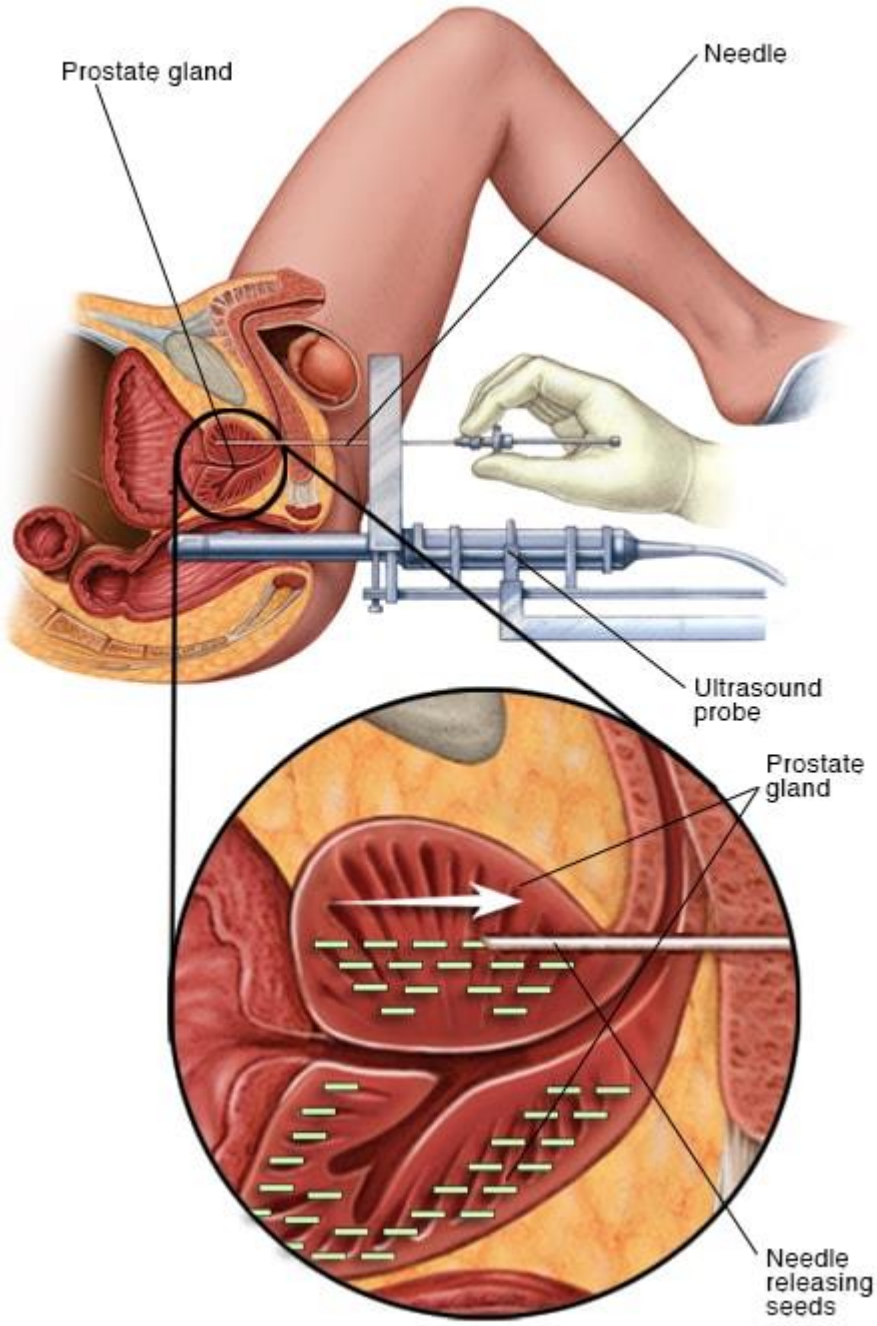
- **Making several small incisions in your abdomen.** During robot-assisted laparoscopic prostatectomy, surgical instruments are attached to a mechanical device (robot) and inserted through several small incisions in your abdomen. The surgeon sits at a console and uses hand controls to guide the robot to move the instruments. Most prostate cancer operations are done using this technique.
- **Making one long incision in your abdomen.** During retropubic surgery, the surgeon makes one long incision in your lower abdomen to access and remove the prostate gland. This approach is much less common, but may be necessary in certain situations.

Discuss with your doctor which type of surgery is best for your specific situation.

Radiation therapy



External beam radiation for prostate cancer



Permanent prostate brachytherapy

Radiation therapy uses high-powered energy to kill cancer cells. Prostate cancer radiation therapy treatments may involve:

- **Radiation that comes from outside of your body (external beam radiation).** During external beam radiation therapy, you lie on a table while a machine moves around your body, directing high-powered energy beams, such as X-rays or protons, to your prostate cancer. You

typically undergo external beam radiation treatments five days a week for several weeks. Some medical centers offer a shorter course of radiation therapy that uses higher doses of radiation spread over fewer days.

External beam radiation is an option for treating cancer that's confined to the prostate. It can also be used after surgery to kill any cancer cells that might remain if there's a risk that the cancer could spread or come back. For prostate cancer that spreads to other areas of the body, such as the bones, radiation therapy can help slow the cancer's growth and relieve symptoms, such as pain.

- **Radiation placed inside your body (brachytherapy).** Brachytherapy involves placing radioactive sources in your prostate tissue. Most often, the radiation is contained in rice-sized radioactive seeds that are inserted into your prostate tissue. The seeds deliver a low dose of radiation over a long period of time. Brachytherapy is one option for treating cancer that hasn't spread beyond the prostate.

In some situations, doctors may recommend both types of radiation therapy.

Freezing or heating prostate tissue

Ablative therapies destroy prostate tissue with cold or heat. Options may include:

- **Freezing prostate tissue.** Cryoablation or cryotherapy for prostate cancer involves using a very cold gas to freeze the prostate tissue. The tissue is allowed to thaw and the procedure repeats. The cycles of freezing and thawing kill the cancer cells and some surrounding healthy tissue.
- **Heating prostate tissue.** High-intensity focused ultrasound (HIFU) treatment uses concentrated ultrasound energy to heat the prostate tissue and cause it to die.

These treatments may be considered for treating very small prostate cancers when surgery isn't possible. They may also be used to treat advanced prostate cancers if other treatments, such as radiation therapy, haven't helped.

Researchers are studying whether cryotherapy or HIFU to treat one part of the prostate might be an option for cancer that's confined to the prostate. Referred to as "focal therapy," this strategy identifies the area of the prostate that contains the most

aggressive cancer cells and treats that area only. Studies have found that focal therapy reduces the risk of side effects. But it's not clear whether it offers the same survival benefits as treatment to the entire prostate.

Hormone therapy

Hormone therapy is treatment to stop your body from producing the male hormone testosterone. Prostate cancer cells rely on testosterone to help them grow. Cutting off the supply of testosterone may cause cancer cells to die or to grow more slowly.

Hormone therapy options include:

- **Medications that stop your body from producing testosterone.** Certain medications — known as luteinizing hormone-releasing hormone (LHRH) or gonadotropin-releasing hormone (GnRH) agonists and antagonists — prevent your body's cells from receiving messages to make testosterone. As a result, your testicles stop producing testosterone.
- **Medications that block testosterone from reaching cancer cells.** These medications, known as anti-androgens, usually are given in conjunction with LHRH agonists. That's because LHRH agonists can cause a temporary increase in testosterone before testosterone levels decrease.
- **Surgery to remove the testicles (orchiectomy).** Removing your testicles reduces testosterone levels in your body quickly and significantly. But unlike medication options, surgery to remove the testicles is permanent and irreversible.

Hormone therapy is often used to treat advanced prostate cancer to shrink the cancer and slow its growth.

Hormone therapy is sometimes used before radiation therapy to treat cancer that hasn't spread beyond the prostate. It helps shrink the cancer and increases the effectiveness of radiation therapy.

Chemotherapy

Chemotherapy uses drugs to kill rapidly growing cells, including cancer cells. Chemotherapy can be administered through a vein in your arm, in pill form or both.

Chemotherapy may be a treatment option for treating prostate cancer that has spread to other areas of the body. Chemotherapy may also be an option for cancers that don't respond to hormone therapy.

Immunotherapy

Immunotherapy uses your immune system to fight cancer. Your body's disease-fighting immune system may not attack your cancer because the cancer cells produce proteins that help them hide from the immune system cells. Immunotherapy works by interfering with that process.

Prostate cancer immunotherapy can involve:

- **Engineering your cells to fight cancer.** Sipuleucel-T (Provenge) treatment takes some of your own immune cells, genetically engineers them in a laboratory to fight prostate cancer and then injects the cells back into your body through a vein. It's an option for treating advanced prostate cancer that no longer responds to hormone therapy.
- **Helping your immune system cells identify cancer cells.** Immunotherapy drugs that help the immune system cells identify and attack the cancer cells are an option for treating advanced prostate cancers that no longer respond to hormone therapy.

Targeted drug therapy

Targeted drug treatments focus on specific abnormalities present within cancer cells. By blocking these abnormalities, targeted drug treatments can cause cancer cells to die.

Targeted therapy drugs may be recommended to treat advanced or recurrent prostate cancer if hormone therapy isn't working.

Some targeted therapies only work in people whose cancer cells have certain genetic mutations. Your cancer cells may be tested in a laboratory to see if these drugs might help you.