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GUIDELINES  
FOR PATIENTS®

2024

# Early-Stage Prostate Cancer



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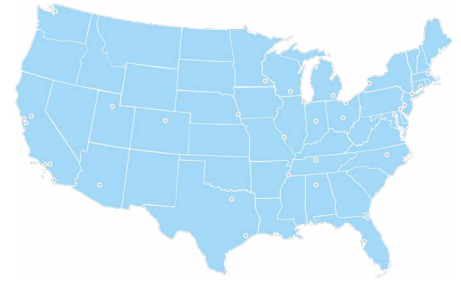
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# About the NCCN Guidelines for Patients®



Did you know that top cancer centers across the United States work together to improve cancer care? This alliance of leading cancer centers is called the National Comprehensive Cancer Network® (NCCN®).



Cancer care is always changing. NCCN develops evidence-based cancer care recommendations used by health care providers worldwide. These frequently updated recommendations are the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®). The NCCN Guidelines for Patients plainly explain these expert recommendations for people with cancer and caregivers.

**These NCCN Guidelines for Patients are based on the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Prostate Cancer, Version 4.2024 — May 17, 2024.**

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# 1

## Prostate cancer basics

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**The prostate is a gland located deep inside the pelvis. Everyone with a prostate has a chance of getting prostate cancer. It's usually not fatal, particularly early-stage prostate cancer. This chapter gives an overview of this common cancer.**

## What is prostate cancer?

Prostate cancer is a disease where cells in the prostate gland grow out of control.

The prostate is a gland located just below the bladder in the pelvis, deep inside the

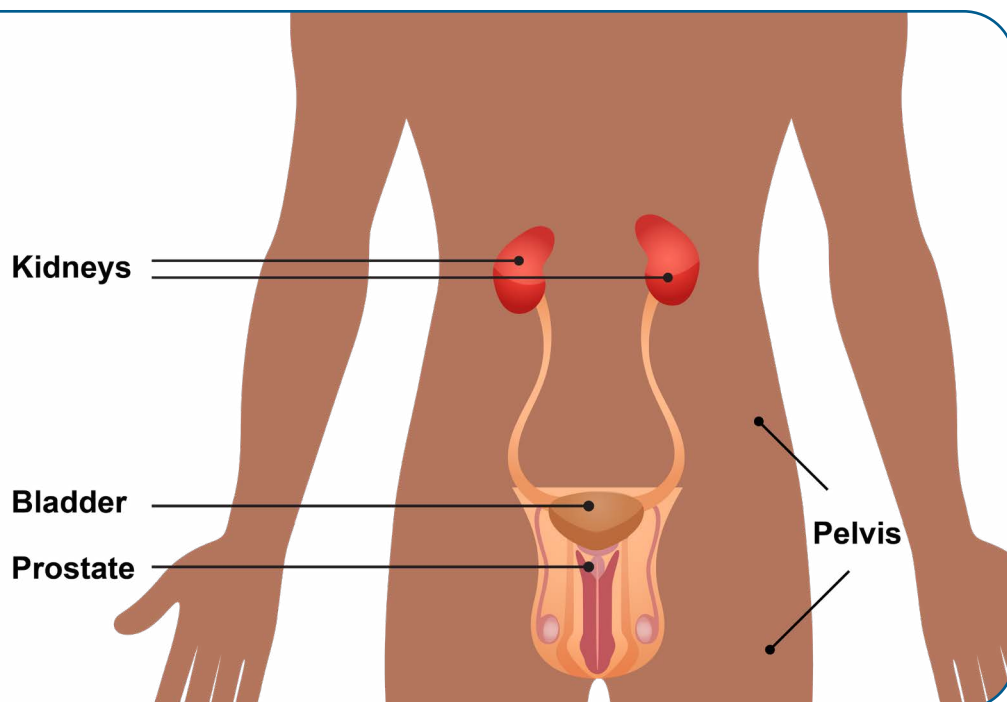
area of your body between your hip bones. The prostate is about the size of a ping-pong ball and is an important part of the male reproductive system. Besides the prostate, the male reproductive system includes the penis, seminal vesicles, and testicles.

Cancer is what happens when something goes wrong with the natural cell process causing some cells to grow out of control.

Cancer cells don't behave like normal cells. Cancer cells develop genetic changes (mutations) that allow them to multiply and make many more cancer cells. The cancer cells crowd out and overpower normal cells. This can end up harming the body.

Cancer cells survive much longer than normal cells do. They can replace many normal cells and cause organs to stop working well. Cancer cells can also spread outside the prostate to other areas of the body.

**The prostate gland is an important part of the male reproductive system. It's located in the pelvis just below the bladder and is about the size of a ping-pong ball.**



## What are the symptoms of prostate cancer?

A symptom is a feeling or problem that can indicate a disease or condition. Prostate cancer often grows slowly and shows no symptoms for a long time.

But you don't have to have symptoms to have prostate cancer. In fact, most patients who are diagnosed with early prostate cancer have no symptoms. Symptoms are more common for those with advanced prostate cancer. Symptoms, if they occur, can include:

- Blood in the urine or semen
- Burning or pain while urinating
- Unexplained weight loss
- Bone, hip, or back pain

It's important to know that prostate cancer has many of the same symptoms as a condition called enlarged prostate (also called benign prostatic hyperplasia, or BPH). An enlarged prostate can push against the bladder and compress the urethra, which slows the flow of urine and can cause a feeling that you haven't fully emptied your bladder.

**Prostate cancer is the second most common cancer in American males, after skin cancer.**

**However, prostate cancer has one of the highest survival rates of any cancer when found early.**

BPH is much more common than prostate cancer. It's difficult to tell the difference between the two conditions based on symptoms alone. Be sure to tell your health care providers if you have any of these symptoms:

- Urinating frequently, especially at night
- Weak or intermittent urine stream
- Trouble urinating or straining to urinate
- Trouble holding in urine
- Feeling like your bladder hasn't fully emptied
- Dull pain in your groin or pelvis
- Erectile dysfunction (difficulty getting an erection) or painful ejaculation



## Where does the prostate fit in?

The prostate is located deep inside the lower body. It makes semen and is important for sexual reproduction.

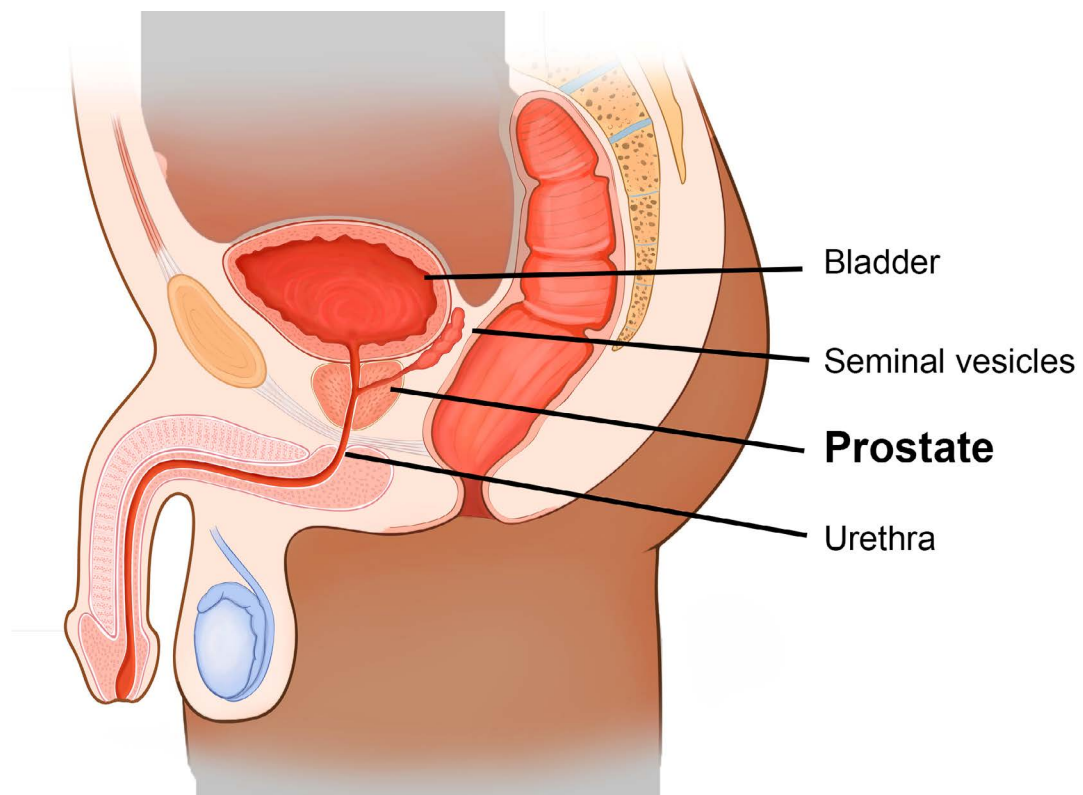
**Prostate:** A gland in the male reproductive system. A gland is an organ that makes fluids or chemicals the body needs. The prostate gland makes a protein (prostate-specific antigen, or PSA) that nourishes and helps transmit semen. The prostate also contains muscles that help propel semen through the urethra during ejaculation.

**Semen:** A fluid made up of liquids from the prostate and the seminal vesicles as well as sperm from the testicles. During ejaculation, semen is released from the body through the urethra and out through the penis.

**Urethra:** A tube that carries urine from the bladder and out of the body. The prostate wraps around the urethra just beneath the bladder.

**Seminal vesicles:** Two glands that make another part of the fluid that becomes semen. The seminal vesicles are located above the prostate and behind the bladder.

**Bladder:** An organ that holds urine.



## What causes prostate cancer?

Many people who develop prostate cancer wonder where it came from and how they got it. Cancer researchers don't know exactly what causes prostate cells to grow out of control (become cancerous). The fact is, everyone with a prostate has a risk of getting prostate cancer.

But several factors are linked to a higher risk of prostate cancer. These are called risk factors. A risk factor is anything that increases your chance of getting cancer. Risk factors don't necessarily cause prostate cancer, but people with prostate cancer usually have one or more of these risk factors:

### Age

The biggest risk factor for prostate cancer is age. Prostate cancer is diagnosed most often in those aged 65 years and above. Your chances of getting prostate cancer increase as you become older.

### Family history

Your family health history is information about the diseases and health conditions in your family. A family history reflects a pattern of certain diseases among family members. Having a close family member with prostate cancer (a sibling or parent) increases the chance of getting it yourself.

Those with a family history of certain other cancers (breast, ovarian, colon, pancreatic, and other cancers) may also be at a higher risk for prostate cancer.

### Genetic factors

When cancer “runs in the family,” genetic testing can be done to find specific genetic changes (mutations) known to be linked with prostate cancer or other cancers. For instance, having an inherited genetic change in the *BRCA2* gene increases the risk of getting prostate cancer. But genetic abnormalities that aren't inherited can occur, too.

### Race

In the United States, Black males are more likely than white males to develop prostate cancer. Prostate cancer in Black males is also more likely to occur at an earlier age and be more aggressive and more advanced when diagnosed. Black males are also twice as likely to die from prostate cancer compared with white males.

Prostate cancer is diagnosed less often in Hispanic and Asian males than in white and Black males.

Several things may contribute to these differences, such as barriers to accessing health care (including early detection screening), biological and genetic factors, and other causes. Specialists are researching each of these areas.

In light of these issues, Black males may want to talk with their health care providers about getting screening tests earlier than what's recommended for other males.

### What does aggressive mean?

When health care professionals describe cancer as aggressive, they mean the cancer is likely to grow or spread more rapidly than average.

Aggressive is also used to describe therapy that's stronger or more intense than other treatment options.

### Diet and lifestyle

No one particular diet has been found to prevent prostate cancer or to cause prostate cancer. However, eating food that's high in fat, such as meat and dairy products, has been linked with an increased risk of prostate cancer.

Eating more fruits and vegetables may reduce this risk. Exercise and losing weight may also decrease the aggressiveness of prostate cancer and the likelihood of dying from it. On the other hand, smoking and obesity increase the risks of developing and dying from prostate cancer.

## What is early-stage prostate cancer?

Prostate cancer can be grouped into early-stage cancer or advanced-stage cancer.

### Early stage

Early-stage prostate cancer has not spread beyond the prostate. The cancer usually grows slowly and stays in the prostate. Cancer that is contained entirely within the prostate is called localized prostate cancer.

This book is all about early-stage (localized) prostate cancer.

### Advanced stage

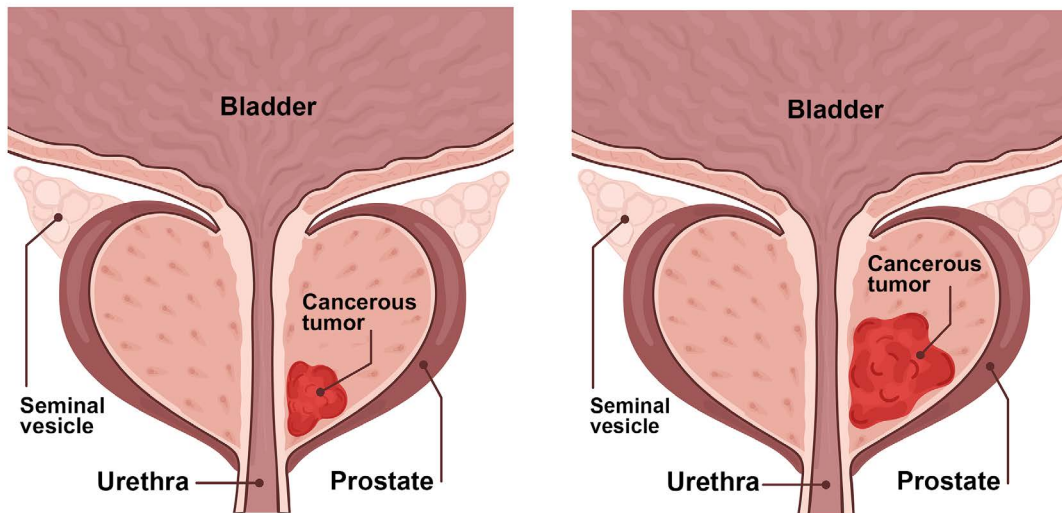
Advanced stage means that cancer cells have spread outside the prostate to other areas in the body. This spreading is called metastasis or metastatic cancer. Metastatic prostate cancer has spread to the lymph nodes, bones, liver, lungs, and other organs.

Advanced-stage prostate cancer can be separated into two types:

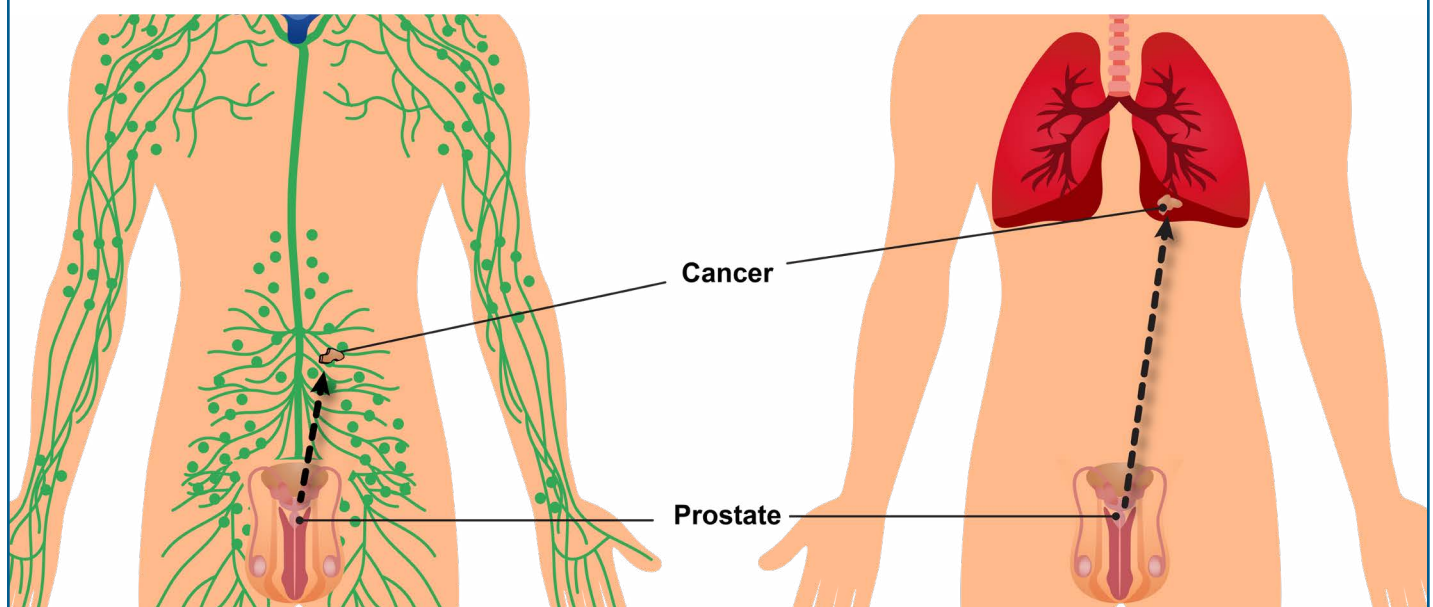
- Cancer that grows from the prostate gland to nearby lymph nodes, but no farther, is called regional prostate cancer. (It's also called locally advanced prostate cancer. This book will call it regional prostate cancer to avoid confusion between localized and locally advanced.)
- Cancer that spreads outside the prostate to other parts of the body is called metastatic prostate cancer.

## Early vs. advanced prostate cancer

**Early-stage prostate cancer** has not visibly spread beyond the prostate gland. It usually grows slowly and stays within the prostate. This is also called localized prostate cancer.



**Advanced-stage prostate cancer** has grown outside the prostate and may have spread to other areas in the body such as lymph nodes (bottom left), bones, or organs like the liver or lungs (bottom right). This is also called metastatic prostate cancer.



## Can prostate cancer be cured?

**Early-stage prostate cancer** is highly treatable and often curable. The earlier that prostate cancer is diagnosed and treated, the more likely that a patient will live without cancer. Most people with early-stage disease live without cancer for many years, usually the rest of their lives.

Scientists have learned a great deal about prostate cancer in recent years. As a result, today's detection methods and treatments work better than those in the past. Also, many patients with prostate cancer have more treatment choices now than they had before.

Treatments for early-stage prostate cancer include surgery, radiation therapy, and hormone therapy, among others. However, some people with prostate cancer don't need to be treated right away. Many patients with early-stage prostate cancer can have their cancer managed with active surveillance.

During active surveillance, you'll have regular tests to keep an eye on your cancer. But you won't have treatment unless the cancer grows or changes in a way that requires treatment.

The goal of active surveillance is to avoid the potential side effects of treatment, with the option for treatment in the future if you need it. Some patients on active surveillance may never have to be treated.

**Advanced-stage prostate cancer** has spread to other areas of the pelvis (regional prostate cancer) or the body (metastatic prostate cancer), and it's usually a life-long disease. But treatment can slow down its growth, reduce symptoms, and prolong your life.

Treatments for advanced-stage prostate cancer include hormone therapy, chemotherapy, radiation therapy, surgery, and other therapies.

Early detection and treatment can greatly reduce the chances of getting advanced-stage prostate cancer. Many people with advanced-stage prostate cancer continue to live their lives with the cancer and, in the end, may die from something else.

Something to remember: When found early, prostate cancer has one of the highest survival rates of any cancer.

## Key points

- Prostate cancer develops when cells in the prostate gland grow out of control.
- Age is the biggest risk factor for prostate cancer. As you age, your chances of developing prostate cancer increase.
- Everyone with a prostate is at risk for prostate cancer. Not everyone with prostate cancer has symptoms.
- For most people, prostate cancer usually grows slowly and stays within the prostate.
- Early-stage prostate cancer hasn't spread outside the prostate gland.
- Advanced-stage prostate cancer has spread outside the prostate to other areas in the body. This spread is called metastasis.
- Not everyone diagnosed with prostate cancer needs treatment.



**Be your own advocate. Talk to someone who has gone through the same thing as you. Ask a lot of questions, even the ones you are afraid to ask. You have to protect yourself and ensure you make the best decisions for you, and get the best care for your particular situation.”**

# 2

## Tests for prostate cancer

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**If you haven't yet been diagnosed, testing is necessary to find out if you have prostate cancer and whether it's early-stage or advanced-stage cancer. Testing also helps your providers plan the right treatment.**

## About testing

Health care providers use a variety of tests to find prostate cancer and to determine how advanced the cancer is. Tests are used to plan treatment, check how well treatment is working, and monitor your health after treatment ends.

This chapter will help you know what tests you may have and what to expect during testing. When you go for testing, bring someone with you to listen, ask questions, and write down the answers.

Testing begins with prostate cancer screening tests, followed by tests of your general health, and then diagnostic tests, if needed.

Not every person with prostate cancer will receive every test listed here.

**When you go for testing, bring someone with you to listen, ask questions, and write down the answers.**





### Common prostate tests

Common prostate cancer tests are used to detect the possibility of prostate cancer in someone who's undiagnosed. They're also used to check and monitor prostate cancer in patients who have been diagnosed.

Two common tests that look for prostate cancer are the prostate-specific antigen (PSA) test and digital rectal exam.

#### PSA test

This is a blood test that measures the amount of PSA in your bloodstream. PSA is a protein made inside the prostate gland. Its job is to help semen transport sperm. All prostate cells, both normal cells and cancer cells, make PSA.

If there's something wrong with the prostate—like prostate cancer—the prostate may make more PSA. While most PSA goes into semen, a little bit ends up in the bloodstream, too. An unusually high amount of PSA in the blood may be a sign of prostate cancer. Likewise, an increase in PSA after treatment may indicate that the treatment is losing effectiveness.

However, age and other factors—such as an enlarged prostate or a urinary tract infection—can also cause high levels of PSA. This means that a PSA test by itself can't provide a diagnosis of prostate cancer. That's why a PSA test is often paired with imaging or a digital rectal exam, or both, to decide whether you need a biopsy.

PSA level (also called total PSA) is measured in nanograms of PSA per milliliter (ng/mL) of blood.

#### PSA testing

**Prostate-specific antigen (PSA) is a protein made inside the prostate gland. If there's something wrong with the prostate, the prostate may make more PSA. An unusually high amount of PSA in the blood may be a sign of prostate cancer.**

**But a high PSA level doesn't automatically mean you have prostate cancer. Rather, it's a warning sign that you may need further testing.**



## Digital rectal exam

Don't be fooled by the name—no high-tech electronics are used in a digital rectal exam. For this test, the word “digital” means “finger.” The doctor will insert a finger into your rectum to feel your prostate for any signs of cancer. The doctor will wear gloves and use a lubricant to make it easier.

A digital rectal exam (also called a prostate exam) may be an awkward and unpleasant form of testing. But it's the simplest and most direct way to check the size and texture of your prostate. An irregular or hardened part of the prostate could be a sign of a tumor.

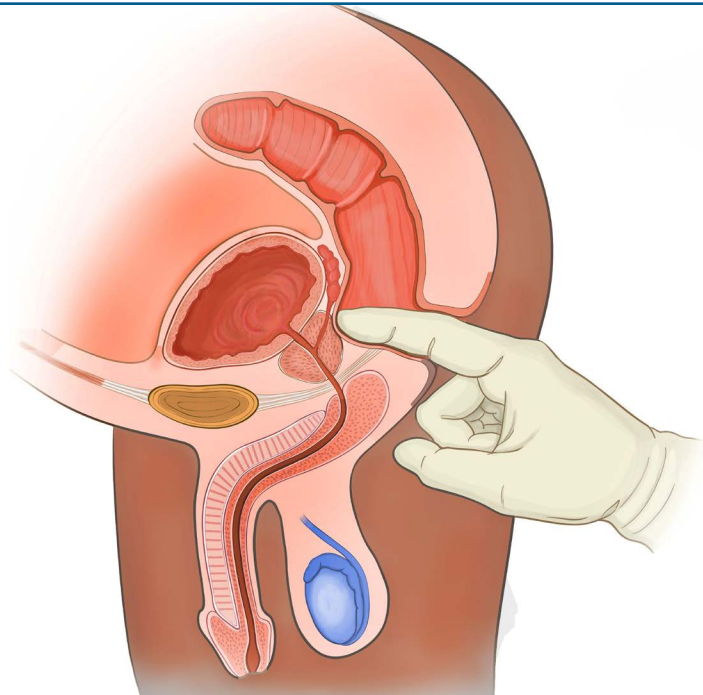
Not all parts of the prostate can be felt during a digital rectal exam, though. So it's usually paired with a PSA test and other factors—your age, race, family history, and more—to determine whether you need further testing.

## Don't fear the digital rectal exam

A digital rectal exam is the simplest and most direct way to check the size and texture of your prostate. Although it can be uncomfortable, it's over in less than a minute.

## Digital rectal exam

**A digital rectal exam is a procedure in which your doctor inserts a finger into your rectum to feel your prostate. An irregular or hardened part of the prostate could be a sign of a tumor. Not all parts of the prostate can be felt during this exam, though. So other tests, like PSA level and imaging, are used to get a more complete picture of your prostate health.**



## General health tests

### Health history

Your care team needs to have all your health information. They'll ask you about any health problems and treatments you've had in your life. Be prepared to talk about any illness or injury you've had and when it happened. Also tell your doctor about any symptoms you have.

Bring a list of old and new medicines and any over-the-counter medicines, herbals, or supplements you take. Some of these (such as saw palmetto or St. John's wort) can cause changes in your PSA level, so your doctor needs to know if you're taking them.

### Family history

Some cancers and other diseases can run in families. Your care team will ask about the health history of family members who are blood relatives. This information is called a family history.

It's important to ask members from both sides of your family about all cancers, not just prostate cancer. Ask family members about other health issues like heart disease and diabetes, at what age they were diagnosed, and if anyone died from cancer. Share this information and any changes to your family history with your care team.

### Symptoms and quality of life

Your doctor or another member of your care team will ask you a series of questions about what symptoms you may have (such as peeing frequently, difficulty peeing or pooping, or sexual problems). You'll also be asked how these symptoms affect your quality of life.

Quality of life refers to your overall satisfaction with your well-being and your ability to participate in regular activities. It's important to answer all these questions honestly and completely so your care team has a full and up-to-date assessment of how you're doing.

### Blood and urine tests

For a blood test, a needle is inserted into a vein in your arm to remove a sample of blood. The sample is examined in a lab where cells, proteins, and other components in the blood are tested for signs of disease or other conditions.

If you have a higher PSA level, you may have additional blood or urine testing. These tests, sometimes referred to as biomarker tests, can be used in addition to PSA to help decide whether further testing is needed. Such blood tests include 4Kscore, PHI, and IsoPSA, among others. Some of the urine tests include ExoDx, miR Sentinel, MPS, PCA3, and SelectMDx.

### Diagnostic tests

If the PSA test, digital rectal exam, blood or urine tests, or other factors (like family history, race, or age) suggest you may have prostate cancer, you'll be offered diagnostic testing.

Talk with your doctor about whether a biopsy or imaging should be the next test you take.

#### Imaging tests

An imaging test takes pictures (images) of the insides of your body. The images can reveal cancer, including its size, location, and other features such as the size of the prostate itself. The images may show where the cancer started (primary tumor) and whether the cancer has spread (metastasized). Imaging is also used after cancer treatment to see how well it worked and to check if the cancer comes back.

Imaging can come before, during, or after a biopsy.

- **Before** – Imaging is sometimes ordered beforehand to find out if a biopsy is truly necessary.
- **During** – Imaging is used during a biopsy to guide the removal of tissue samples.
- **After** – Imaging may come after a biopsy to see the size and location of the cancer, which helps to plan treatment.

Imaging methods for detecting prostate cancer include MRI, CT, PET, ultrasound, bone scan, or a combination of these.

After your scan, your images will be studied by a radiologist. A radiologist is a doctor who's an

expert in reading imaging tests. The radiologist will send the results to your doctor. This information helps your doctor plan the next steps of your care. Your doctor will discuss the results with you. Be sure to ask any questions you may have.

Imaging may not be needed for early-stage prostate cancer. If your PSA, digital rectal exam, and prostate biopsy results indicate that your risk is low for the cancer to metastasize (spread beyond the prostate), then you may not need imaging tests at this time.

Your team may recommend one or more of the following imaging tests to look for cancer growth:

#### MRI scan

A magnetic resonance imaging (MRI) scan uses radio waves and powerful magnets to take pictures of the inside of the body. An MRI can provide a detailed view of the cancer within the prostate. It's also used to see if cancer has spread to nearby lymph nodes or to the bones in your pelvis.

MRI may be used before a biopsy to target areas suspicious for cancer. Or it may be used after diagnosis to figure out whether the cancer has advanced outside the prostate or into the lymph nodes. It can help to plan treatment or to decide whether active surveillance is appropriate. MRI can also be used after treatment to check if the cancer has come back (recurrence).

An MRI scanner is a large machine with a tunnel in the middle. An MRI machine makes a lot of noise but you can wear headphones or earplugs and listen to music.

You may also be given a contrast agent (sometimes called contrast dye) before the scan. Contrast is used to make blood vessels, organs, and other tissues stand out more clearly in the images. The contrast agent is injected into the bloodstream and flushed out in urine.

An appointment for an MRI scan can take about 1 to 2 hours, including 30 to 60 minutes of actual scanning time. You'll need to remain as motionless as possible during each scan. You may be positioned with pillows or bolsters to help you keep still.

Because an MRI uses magnets, don't bring any metal objects (such as jewelry, cell phone, wristwatch, belts with metal buckles) into the imaging room.

### CT scan

If MRI is unavailable or not recommended for you, you might have a computed tomography (CT or CAT) scan instead. A CT scan takes many x-rays of your body from different angles. A computer combines all the x-ray pictures to make a single detailed image.

### PET scan

A positron emission tomography (PET) scan highlights cells in your body that may be cancerous. A PET scan is used after you've been diagnosed to determine the extent of your cancer or to see if it has metastasized. PET imaging can also show how well treatment is working.

A PET scan requires injecting a radioactive substance called a tracer into your bloodstream. It takes about an hour for the tracer to circulate throughout your body. The tracer targets your cancer cells, which show up as bright spots on the scan. Afterward, the radiotracer is passed out of your body in your urine.

### PET imaging

**A positron emission tomography (PET) scan highlights cells in your body that may be cancerous. A PET scan is used after you've been diagnosed to determine the extent of your cancer or to see if it has metastasized. PET imaging can also show how well treatment is working. An irregular or hardened part of the prostate could be a sign of a tumor. Not all parts of the prostate can be felt during this exam, though. So other tests, like PSA level and imaging, are used to get a more complete picture of your prostate health.**



Like an MRI and CT, a PET scanner is a large machine with a tunnel in the middle. A PET appointment can take 1 to 2 hours, including about 30 minutes of actual scanning time.

Because PET uses a different imaging method, it's often combined with other types of imaging, such as CT or MRI, to provide an even more detailed image. These combined methods are called PET/CT or PET/MRI scans.

### PSMA/PET

PSMA/PET imaging is a special kind of PET imaging that locates a protein called prostate-specific membrane antigen (PSMA) on the surface of prostate cancer cells. Prostate cancer cells make a lot of PSMA, so doctors developed tracers that target this specific protein.

PSMA/PET is especially useful for detecting cancer that has spread to nearby lymph nodes or has metastasized to farther areas.

It's also used to monitor prostate cancer that may return after treatment (recurrence). So, someone with early-stage prostate cancer may not need PSMA/PET imaging when first diagnosed. Your team will discuss whether a PSMA/PET scan could be helpful for your specific cancer.

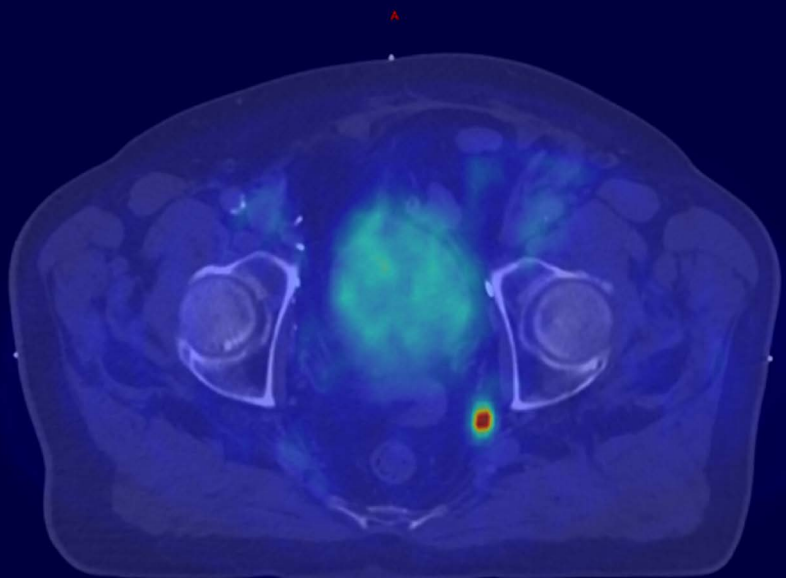
### Bone scan

A bone scan can detect whether cancer has spread to your bones. A bone scan may be used if you have bone pain, have a high risk for bone metastases, or have changes in certain test results. Bone scans may also be used to monitor treatment.

A bone scan uses a radioactive tracer to make pictures of the inside of bones. Before the pictures are taken, the tracer is injected into your bloodstream. It can take a few hours for the tracer to enter your bones.

### PET/CT scan of prostate cancer

This image combines PET and CT scans to show a cross-section of a patient's pelvis. The greenish circle identifies cancer in the prostate, while the intense red dot indicates cancer that has spread to a pelvic lymph node.



A special camera will take pictures of the tracer in your bones. Areas of bone damage absorb more tracer than healthy bone. These areas show up as bright spots in the pictures. Bone damage can be caused by cancer, cancer treatment, or other health problems.

### Biopsy

Although a high PSA level and an abnormal digital rectal exam are signs of possible prostate cancer, the only way to confirm cancer is to have a biopsy. A biopsy is a procedure in which a sample of cells or tissue is removed from your body and tested for cancer.

A biopsy is an invasive test, which means that it goes into (invades) your body. All invasive tests have some risk. The risks for a prostate biopsy include infection, bleeding, and pain. Doctors use invasive tests only when needed.

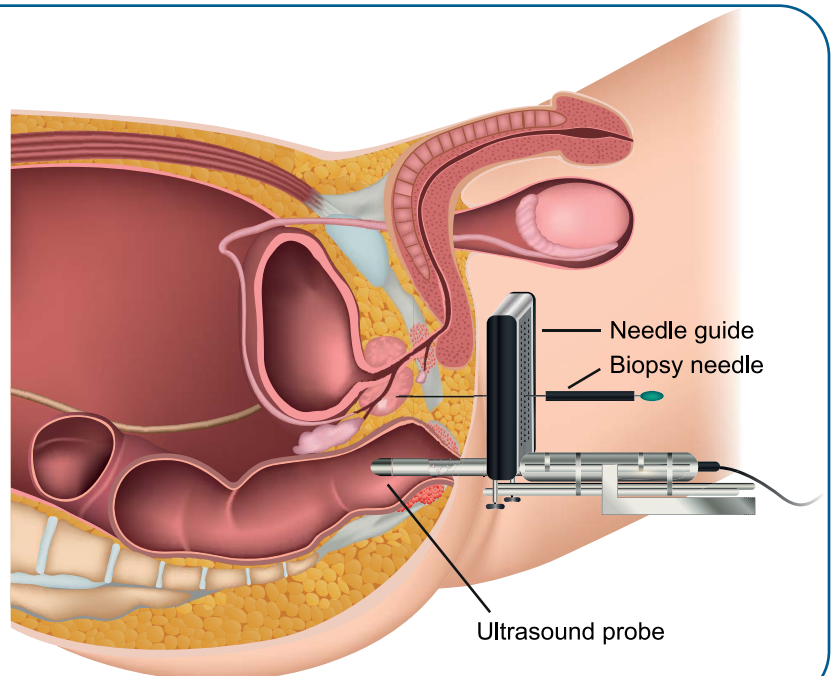
You and your doctors will decide when, or if, you need a biopsy.

A biopsy procedure is usually performed by a urologist. A urologist is a doctor who's an expert in treating diseases of the urinary system and the male reproductive organs. For this procedure, you'll lie on your side with your knees curled up or you'll lie on your back with your legs raised. You'll be given anesthesia to numb the pain or to put you to sleep. The urologist will insert a lubricated probe into your rectum. The probe provides a visual image of the prostate.

The urologist will then insert a hollow needle into the prostate gland using the video display to guide it. The needle will be inserted either through the rectum or through the perineum (the skin between the anus and scrotum). When the urologist removes the needle, it will pull out a small sample of prostate tissue called a core. A core sample is only 1 to 2

### Biopsy of the prostate

**A biopsy removes a sample of tissue that is tested for cancer. This is a transperineal biopsy, in which a needle is inserted through the perineum and into the prostate. An ultrasound probe, which goes into the rectum, helps the doctor guide the needle into the prostate. MRI scans of your prostate may be combined with the ultrasound image to provide a highly accurate picture of the cancer.**



millimeters wide and about 12 to 20 millimeters long—about the width of a toothpick and the length of a raisin. The urologist will typically take 12 or more core samples from different parts of the prostate. Checking different areas provides a more complete evaluation of cancer throughout the gland.

After the biopsy samples are removed, they'll be sent to a lab for testing. At the lab, a specialist called a pathologist will examine the samples under a microscope and test them for cancer. The pathologist will find out how many of the core samples contain cancer and will also measure the percentage of cancer in each core. With this information, the pathologist can estimate the amount of cancer in the prostate. Also, by knowing where each core sample was taken, the pathologist can tell if the cancer is concentrated in a certain section of the prostate.

The pathologist will put these results into a report. Ask your doctor to review the pathology report with you.

It's common to have more than one biopsy if you're on active surveillance. You'll have one biopsy to determine your diagnosis and another biopsy within a year (called a confirmatory biopsy) to see if any changes have happened over time.

Having a biopsy may cause complications. A complication is an unwanted and unplanned result from a procedure. Complications may include infection, bleeding from the rectum, or blood in the urine, stool, or semen. These usually go away after a few days or, with semen, after a few weeks. However, it's important to know that a biopsy doesn't cause prostate cancer to spread or worsen.

### Genetic tests

A genetic test is used to find abnormal changes in your genes. Genes are small segments of DNA inside every cell. Genes provide the instructions to tell the cell how to make proteins, which carry out a lot of important functions in the body.

Once in a while, a gene will have or develop an abnormal change (mutation). A mutation is when something is different in your genes than in most other people's genes. Sometimes an abnormal change can cause a gene to make the wrong type of protein or make no protein at all. This abnormality could affect the cell, which may in turn cause a disease such as cancer.

Mutations can be passed down in families, in which case they occur in every cell in your body. Or mutations can occur spontaneously in just some of your cells. In other words, they may be present before you're born (called an inherited or germline mutation) or occur on their own later in life (called an acquired or somatic mutation).

The two basic types of genetic tests used for prostate cancer care are germline testing and molecular biomarker testing:

#### Germline testing

Sometimes, mutations in genes inherited from your parents can increase the risk of different cancers. You can pass these genes on to your children. Other family members might also carry these mutations. If you have a family history of cancer, your doctor might suggest genetic germline testing to find out if you have an inherited cancer risk.

The goal of this type of genetic testing is to look for germline (inherited) mutations that



occur in every cell in your body. Genetic germline testing is done using a sample of your blood, urine, or saliva.

For prostate cancer, germline testing looks for characteristic changes in these genes: *BRCA1*, *BRCA2*, *ATM*, *CHEK2*, *MLH1*, *MSH2*, *MSH6*, *PALB2*, *PMS2*, and others. Some mutations can put you at risk for more than one type of cancer. Germline mutations in genes like *BRCA1* or *BRCA2* are also related to breast cancer, ovarian cancer, pancreatic cancer, and skin cancer (melanoma). Germline mutations in *MSH2*, *MSH6*, *MLH1*, and *PMS2* are related to colorectal and uterine cancers in addition to prostate cancer.

If a germline mutation is suspected based on your family's or your own health history, you should ask about testing. Your doctor can talk to you about testing or refer you to a genetic counselor. A genetic counselor is an expert who has special training in genetic diseases. A genetic counselor can help you decide whether you would like to undergo germline testing and help you interpret the results of these tests.

Germline testing is recommended for those with prostate cancer and any of the following:

- Family members or relatives who have or had prostate cancer, breast cancer, ovarian cancer, intestinal cancer, and certain other cancers
- Family history of mutations in certain genes including *BRCA1*, *BRCA2*, *ATM*, *CHEK2*, and others

- High-risk, very-high-risk, regional, or metastatic prostate cancer regardless of family history
- Ashkenazi Jewish ancestry
- Having any other type of cancer

Talk to your medical providers and/or a genetic counselor about your family history of cancer.

### **Molecular biomarker testing**

In biomarker testing, a sample from your biopsy is tested to look at its molecular components. This information helps figure out how likely your cancer could spread to other parts of the body. Biomarker testing can be considered for those with localized, regional, or metastatic prostate cancer. Biomarker testing is sometimes called genomic testing, tumor profiling, or molecular tumor testing.

The main reason to have a molecular biomarker test is to help assess whether you have lower risk or higher risk prostate cancer. If you have lower risk cancer, you may be able to avoid or delay treatment such as surgery or radiation therapy, which means you'd also avoid or delay any treatment-related complications and side effects. At the same time, a molecular biomarker test can flag those who have higher risk prostate cancer, which may give them a head start on treatment.

Molecular biomarker testing is discussed further in *Chapter 3*.

## What's next?

After you've had all these tests to find out if you have prostate cancer, your care team will put together all your test results to figure out whether your prostate cancer is lower risk or higher risk.

Once your level of risk has been identified, your team will assess whether you need treatment and, if so, what your treatment plan will be.

## Key points

- ▶ An unusually high amount of PSA in the bloodstream may be a sign of prostate cancer.
- ▶ A digital rectal exam is the simplest way to check the size and texture of your prostate.
- ▶ A biopsy is used to confirm (diagnose) prostate cancer. It's a procedure that removes samples of cells or tissue to find cancer.
- ▶ Imaging tests may be used to see if the cancer has spread beyond the prostate. Imaging may not be needed for early-stage prostate cancer.
- ▶ A genetic test is used to find abnormal changes (mutations) in your genes.
- ▶ To find out if you have an inherited risk for cancer, you can talk to your doctor about germline testing or ask to be referred to a genetic counselor.
- ▶ A biopsy sample of your tumor might be tested to look at its molecular components (biomarker testing).

# 3

## Assessing your risk

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- 34 Key points

**It's important to know the risk of your cancer getting worse. Your care team will look at several key characteristics to assess your risk. This chapter explains each of these characteristics.**

After being told you have cancer, your next thought may be, “How soon can I start treatment to get rid of it?” The fact is, a lot of patients with early-stage prostate cancer don't need treatment right away. Many never need treatment.

Figuring out whether someone needs treatment and which treatment to use requires an assessment of their risks. A risk assessment is a process for identifying potential problems and then considering what would happen if those problems occurred.

In the case of early-stage prostate cancer, a risk assessment considers how likely the cancer is to remain within the prostate or to spread to outside the prostate. A risk assessment also considers whether the cancer may come back after treatment (recurrence) and, if so, whether it can be controlled with a different type of treatment.

To assess risk, your care providers use these tools: **risk groups**, **life expectancy**, **nomograms**, and **molecular biomarker tests**. Although you may not receive all of them, let's look at each of these assessment tools in turn:

## Risk groups

Your care team will look at the clinical characteristics of your cancer, such as your prostate-specific antigen (PSA) level, biopsy results, and other test results. From this information, your providers can classify your disease into one of five different risk groups, from very low risk to very high risk.

Why do you need to know your risk group? Because your risk group is the basis for your prognosis. A prognosis predicts the likely course and outcome of a disease. Your prognosis guides your treatment options. For example, patients with lower risk generally get minimal treatment or no treatment at all. Patients with higher risk usually get more aggressive treatment.

Test results and calculations—**PSA level**, **Grade Group**, **tumor stage**, and **biopsy results**—are put together to determine your risk group.

#### PSA level

A simple blood test will tell you how much prostate-specific antigen (PSA) is in your bloodstream. A high PSA level may indicate a risk for prostate cancer. However, high PSA levels can vary by age, race, and other factors:

- **Age** – PSA level tends to increase with age. For people in their 40s, a PSA level above 2.5 ng/mL is very suspicious for disease. For those in their 60s, 4.5 ng/mL or higher is suspicious. A PSA level of 10 ng/mL or higher is a danger sign at any age.
- **Race** – Normal PSA levels tend to be higher in Black males than in white males—about 1 point higher on average among males of the same age. Researchers don't know the reason for this difference, but they're investigating it.
- **Enlarged prostate** – The larger the prostate, the more PSA it can make. Other health issues besides cancer can also cause an enlarged prostate.
- **Sex and exercise** – PSA may increase after ejaculation or vigorous exercise. Your doctor may recommend avoiding sex and exercise for 2 or 3 days before a PSA test. This short break allows PSA to return to its usual level.
- **Drugs and supplements** – Some medicines, herbals, and supplements can also affect PSA level.
- **Biopsy** – PSA level rises temporarily after a biopsy of the prostate.



**Now more than ever, those living with cancer are living better, longer lives thanks to the power of research and advancements in treatment.”**

PSA level doesn't tell the whole story, though. There are other ways that PSA can be interpreted, such as PSA density.

#### PSA density

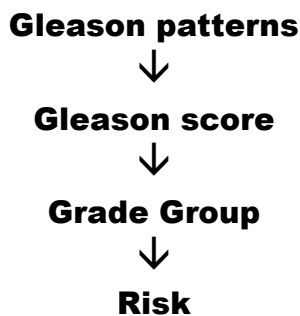
If you have a larger prostate, you're also likely to have a higher PSA level. But that doesn't mean you have a greater risk for prostate cancer. To adjust for this, care providers calculate PSA density.

PSA density is the amount of PSA compared to the size of the prostate. PSA density is calculated by dividing the PSA level by the prostate size. The size of the prostate is measured by transrectal ultrasound or MRI scan. A higher PSA density (above 0.15 ng/mL<sup>2</sup>, for example) indicates a greater likelihood of cancer. PSA density also accounts for those with small and very small prostates, who could have prostate cancer even with low PSAs.

## Grade Group

If cancer cells are found in your biopsy samples, further testing can identify your cancer risk. Results from these tests may indicate that the cancer will grow and spread quickly, for example. Or the results may suggest that the cancer will grow very slowly and not spread outside of the prostate at all. This information helps plan the best treatment for your type of cancer.

By looking at your biopsy samples, the pathologist will identify certain cancer cell patterns (called Gleason patterns), which are used to calculate your Gleason score, which translates to your Grade Group, which estimates your risk.



This can be confusing at first (*Gleason patterns? Gleason score? Grade Group?*) but it's not all that complicated in the end. Read on.

### Gleason patterns

After studying your biopsy sample under a microscope, the pathologist will assign a number based on the “pattern” of cancer cells (Gleason pattern) in the sample. A cancer cell pattern that looks more like normal and healthy cells is given a lower number. A cell pattern that looks more abnormal is assigned a higher number.

Gleason patterns range from 1 to 5. However, patterns 1 and 2 are so rarely found that they are no longer used. So the lowest (most normal) pattern number is 3.

### Gleason score

If prostate tumors contained only one pattern of cancer cells, estimating risk would be much easier. But prostate biopsies often contain more than one pattern of cells.

To account for this, the two most common Gleason patterns found in the biopsy sample are combined into a single Gleason score. The pattern of cancer cells that takes up the largest area in the sample is assigned the first number. The pattern that accounts for the second-largest area is given the second number.

Add these two numbers together and you get a Gleason score. For example:

**pattern 3 + pattern 4 =  
Gleason score of 7**

A Gleason score represents how much your biopsy sample looks like normal prostate tissue. It also estimates how aggressive your prostate cancer is—how quickly it might grow and whether it will spread. A higher Gleason score means the cancer is more likely to grow and spread quickly than a cancer with a lower Gleason score.

Gleason scores range from 6 to 10, where 6 is the lowest score. A Gleason score of 7 is intermediate-grade, and 8 to 10 is high-grade. This can be confusing because 6 seems like it would be a medium score, not a low score. So to make Gleason scores simpler to use, they can be organized into Grade Groups.

### Grade Groups

A Grade Group is a way to interpret a Gleason score. There are five Grade Groups, numbered 1 to 5. The higher the Grade Group, the more aggressive the cancer. So cancer with a Gleason score of 6 is assigned as Grade Group 1 to show that it is the lowest score. Likewise, cancer with a Gleason score of 9 or 10 becomes Grade Group 5, the highest score.

Importantly, the Grade Group system also takes into account that Grade Group 2 and Grade Group 3 both have a Gleason score of

7. The difference is the cancer in Grade Group 3 is more serious. Why? Because the first number of the Gleason score in Grade Group 3 (4+3) is higher than the first number in Grade Group 2 (3+4). Remember, the first number is given to the cancer pattern that makes up the largest area of the biopsy sample.

Grade Group 1 indicates low risk. Grade Groups 2 and 3 correspond to intermediate risk. Grade Groups 4 and 5 predict high risk and very high risk. **See Guide 1.**

### Guide 1

#### How to find your risk from your Gleason score

| Gleason patterns  | Gleason score | Grade Group | Prognosis  |
|-------------------|---------------|-------------|--|
| 3+3               | 6             | 1           | <b>Low-grade cancer</b><br>is less aggressive and is likely to grow and spread very slowly. If the cancer is small, many years may pass before it becomes a problem. Low-grade cancer may never need treatment.                        |
| 3+4               | 7             | 2           | <b>Intermediate-grade cancer</b><br>is moderately aggressive and likely to grow and spread at a modest pace. If the cancer is small, several years may pass before it becomes a problem. To prevent problems, treatment may be needed. |
| 4+3               | 7             | 3           |  |
| 4+4<br>3+5<br>5+3 | 8             | 4           | <b>High-grade cancer</b><br>is very aggressive and likely to grow and spread quickly. If the cancer is small, a few years may pass before the cancer becomes a life-threatening problem. To prevent problems, treatment is needed now. |
| 4+5<br>5+4<br>5+5 | 9 or 10       | 5           |  |

### Tumor stage

The next characteristic that contributes to your overall risk group is the tumor stage. Staging is a way to describe the severity of the cancer in your body and how far it has spread. Knowing your stage is important for predicting the course of your disease and for making a treatment plan.

The tumor, node, metastasis (TNM) system is used to stage prostate cancer. In this system, the letters T, N, and M stand for different areas of cancer growth:

- **T (tumor)** – Describes the size of the main (primary) tumor and if it has grown outside the prostate
- **N (node)** – Identifies whether cancer has spread to lymph nodes
- **M (metastasis)** – Indicates if cancer has spread to distant parts of the body (metastasized)

Your providers will assign a number to each letter, based on test results. For example, the number after T ranges from 0 through 4 based on the tumor's size and growth. The higher the number, the larger the tumor or the more the cancer has spread.

The T, N, and M scores are combined to assign a stage to the cancer.

Let's say your prostate cancer is given a TNM score of **T2, N0, M0**. This score means that the tumor is big enough to be felt during a digital rectal exam (T2). But the numbers after N and M are zeros because early-stage cancer hasn't spread outside the prostate gland to lymph nodes (N0) or to distant parts of the body (M0).

A letter may also be included after the tumor stage (T2a, for example) to give more information based on the digital rectal exam or an examination of prostate tissue. The letter stands for the extent of cancer and/or its location in the prostate. **See Guide 2.**

Cancer staging is often done twice. The first time is before any treatment. The second time is during or after treatment to see how well the treatment has worked.

### Biopsy results

Results from your core needle biopsy also help to determine your overall risk group. One finding is the number of core samples that contain cancer (for example, 5 out of 12 in each core). Using this information, the pathologist can estimate the amount of cancer in the entire prostate. Biopsy results can also show whether the cancer is concentrated in a certain section (or sections) of the prostate.

### What's your risk group?

Based on the results of these tests and calculations—PSA level, Grade Group, tumor stage, and biopsy results—you'll be placed into an initial risk group. **See Guide 3.**

Your risk group helps determine which treatment options may be best for you. Using these tests together to create risk groups is more reliable than using any test by itself to choose treatment options.

But risk groups aren't the only risk assessment tool. There's also life expectancy, nomograms, and molecular biomarker tests.



## Life expectancy

Life expectancy is the average lifespan of a person. It's measured in years. An estimate of your life expectancy is a key factor in deciding which tests and treatments you'll need.

It's important to know that life expectancy—when used for cancer care—is an estimate based on large numbers of people. That

means life expectancy can be applied to a certain population or age range, but it's not as easy to make a precise estimate of the lifespan of an individual person.

So why estimate your life expectancy? Sometimes, patients in certain risk groups should wait until symptoms appear before having tests or starting treatment. There may be no benefit to having additional tests or

### Guide 2

#### Tumor details for T stage

##### **T1 – The tumor can't be felt by a digital rectal exam, but a biopsy found cancer cells.**

**T1a** – The tumor is found unexpectedly during another procedure. Only a small part (5 percent [5%] or less) of the removed tissue is cancer.

**T1b** – The tumor is found unexpectedly during another procedure. More than a small part (more than 5 percent [5%]) of the removed tissue is cancer.

**T1c** – A high PSA level called for a biopsy of the prostate.

##### **T2 – The tumor can be felt by a digital rectal exam. It hasn't spread outside the prostate.**

**T2a** – Cancer is found in half or less than half of one side of the prostate.

**T2b** – Cancer is found in more than half of one side of the prostate, but it isn't in both sides.

**T2c** – Cancer has grown into both sides of the prostate.

##### **T3 – The tumor has spread outside the prostate to nearby tissues, but no farther.**

**T3a** – Cancer has grown outside the prostate, but not into the seminal vesicle(s).

**T3b** – Cancer has grown outside the prostate and into the seminal vesicle(s).

##### **T4 – The tumor has spread outside the prostate to nearby tissues and also to other areas such as the bladder, rectum, pelvic wall, and/or pelvic muscles.**

### Guide 3 Characteristics that make up your risk group

| Risk group                           | PSA level   | Grade Group | Tumor stage | Biopsy results  |
|--------------------------------------|---|-------------|-------------|---|
| <b>Very Low Risk</b>                 | Must have <b>all</b> of these characteristics:          |             |             |   |
|                                      | Less than 10 ng/mL*                                     | 1           | T1c         | Cancer found in 1 or 2 biopsy cores with no more than half of each core showing cancer        |
| <b>Low Risk</b>                      | Must have <b>all</b> of these characteristics:          |             |             |   |
|                                      | Less than 10 ng/mL                                      | 1           | T1 to T2a   | Cancer found in more than 3 biopsy cores, but fewer than half of all cores show cancer        |
| <b>Favorable Intermediate Risk</b>   | Must have <b>all</b> of these characteristics:          |             |             |   |
|                                      | 10 to 20 ng/mL  | 1 or 2      | T2b or T2c  | Cancer found in fewer than half of all biopsy cores   |
| <b>Unfavorable Intermediate Risk</b> | Must have <b>at least one</b> of these characteristics: |             |             |   |
|                                      | 10 to 20 ng/mL  | 3           | T2b or T2c  | Cancer found in more than half of all biopsy cores  |
| <b>High Risk</b>                     | <b>Only one</b> of these characteristics needed:        |             |             |   |
|                                      | More than 20 ng/mL                                      | 4 or 5      | T3a         | More than half of all biopsy cores show cancer, but fewer than 4 cores are Grade Group 4 or 5 |
| <b>Very High Risk</b>                | Must have <b>at least one</b> of these characteristics: |             |             |   |
|                                      | More than 20 ng/mL                                      | 5**         | T3b to T4   | More than 4 biopsy cores are Grade Group 4 or 5   |

\* With PSA density less than 0.15

\*\* In the cancer cells that take up the largest area in the biopsy sample

undergoing treatment if you don't have any symptoms or if you have other more life-threatening health conditions.

If you don't have any symptoms, are expected to live 10 years or less, and have very-low-risk, low-risk, or intermediate-risk prostate cancer, then observation is usually recommended. This is different than active surveillance, which usually involves routine imaging and biopsies.

We'll talk more about life expectancy and how it impacts treatment options in *Chapter 5*.

## Nomograms

A nomogram predicts your prognosis, which is the likely course your cancer will take. A nomogram uses math to compare you and your prostate cancer to hundreds or thousands of other patients who have been treated for prostate cancer.

To use a nomogram, your doctor will input information about you and the characteristics of your cancer—your age, PSA level, Gleason score, or other details—and the nomogram will calculate the likelihood of a certain outcome (such as the cancer spreading).

Risk groups and nomograms both provide information that is specific to you, but nomograms can give somewhat more accurate estimates of cancer risk. Both are used, along with other risk assessment tools, to plan treatment.

## Molecular biomarker tests

A biomarker is something found in your body that can be measured to assess your health. One type of cancer biomarker is a molecule released by a tumor.

Molecular biomarker tests use samples of your blood or your prostate or lymph node tissue removed during a biopsy. Results from these and other tests may help choose a treatment plan that's right for you.

Importantly, molecular biomarker tests can help identify patients with lower risk prostate cancer who don't need treatment right away. These patients can be spared aggressive treatment along with its complications and side effects.

A molecular biomarker test is also known as a molecular tumor test, genomic test, somatic test, or tumor profiling. A few of the more common molecular tests for prostate cancer are named Decipher, Genomic Prostate Score, and Prolaris.

If your doctor or genetic counselor recommends molecular testing, it would be in addition to standard measures such as PSA, Gleason score, Grade Group, and imaging. If you have any questions about why you're having a test or what it means, ask your care team.

## What's next?

This chapter explained how your care providers figure out your risk for your prostate cancer to grow and spread. Your risk level determines which treatment options are available to you. In many cases, early-stage cancer grows very slowly and may not spread (metastasize) to other parts of the body. So you may not need treatment right away.

Still, it's important to know about all the types of therapies available, if and when you do need treatment. The next chapter describes each of the treatment options for early prostate cancer. After that chapter, you'll read about which treatments may be best for you depending on your level of risk.

## Key points

- A risk assessment identifies potential problems and then considers what would happen if those problems occurred.
- A risk assessment for early-stage prostate cancer takes into account your risk group, life expectancy, nomogram results, and possibly molecular biomarker profile.
- Patients with lower risk generally get minimal or no treatment. Patients with higher risk usually get more aggressive treatment.
- Cancer staging describes how much cancer is in the body and where it is located.
- Life expectancy is an estimate of the number of years you will likely live. It's based on large numbers of people and is not an exact prediction. But it can help choose the best treatment for you.
- A nomogram predicts the course your cancer will likely take (prognosis).
- An important feature of molecular tumor (biomarker) testing is that it can identify lower risk prostate cancer that doesn't need treatment right away.

# 4

## Prostate cancer treatments

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- 43 Hormone therapy
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**There's more than one treatment for prostate cancer. This chapter describes all the treatment options. Talk with your care team about which treatment might be best for you.**

Prostate cancer is usually a slow-growing disease. It's also a complex disease with many treatment options. Common treatments for early-stage prostate cancer include surgery and radiation therapy, which are sometimes combined with hormone therapy.

Then again, your treatment plan may include no direct therapy but instead involve active surveillance or observation.

### Active surveillance

Active surveillance is a plan that closely watches your condition, with treatment at the ready if needed.

Because a small tumor can grow very slowly, it's possible to wait to treat prostate cancer until the tumor grows larger. During this time, you'll have tests and biopsies on a regular basis to look for changes in tumor growth.

Although your care team may ask you to have tests more or less frequently, regular testing during active surveillance may follow a schedule like this:

- PSA once or twice a year
- Digital rectal exam once a year
- MRI every 1 to 2 years
- Prostate biopsy every 2 to 5 years

You won't receive any cancer treatment during active surveillance. But treatment will begin if your cancer grows or spreads.

Why wait to be treated? Mainly because surgery and other forms of treatment have side effects. If you can delay treatment without harm—or avoid it altogether—then you can also delay or entirely avoid the side effects of treatment.

In general, active surveillance is the preferred strategy for patients with lower-risk prostate cancer and a longer life expectancy (10 years or more).

To see if you're a good candidate for active surveillance, you may need a confirmatory MRI with or without a confirmatory prostate biopsy. These confirmatory tests are usually performed within a year of your diagnosis to see if any changes have happened during that time.

Other factors to consider for active surveillance:

- Your life expectancy
- Your overall health
- Features or unique qualities of your tumor
- Possible side effects of treatment
- Your wishes about treatment

A big question about active surveillance: When do you know to switch from surveillance to treatment? There are a number of factors, but the most common one is that a patient's Grade Group in a recent biopsy has increased compared to a previous biopsy.

Other reasons for starting treatment may include an increase in the size of the tumor or a rise in PSA level.

### Observation

Observation involves monitoring your prostate cancer and watching for symptoms. (You may hear it called watch-and-wait or watchful waiting.) If symptoms develop, treatment is often focused on palliative care or symptom relief instead of trying to cure the cancer.

Palliative care treats the symptoms of cancer and the side effects of cancer treatment. This allows patients to maintain a good quality of life without the burden of unnecessary treatment.

Observation often applies to older or frail patients with intermediate-risk prostate cancer and shorter life expectancies (5 to 10 years). It's also recommended for patients with lower risk prostate cancer and short life expectancy (5 years or less). These patients commonly have one or more other illnesses or diseases that are more severe than their prostate cancer.

Observation is different from active surveillance. Observation is a less aggressive way to monitor prostate cancer. It doesn't require regular biopsies—just a visit for a physical once or twice a year. By comparison,

active surveillance involves frequent testing to see whether the cancer is progressing in order to treat it before it can get worse.

### Surgery

Surgery is a procedure to remove cancer from the body. The tumor is removed along with some normal-looking prostate tissue around its edge called the surgical margin.

- A **positive margin** is when cancer cells are found along the edge of the tissue that the surgeon removes.
- A **negative margin** is when no cancer cells are found around the edge of the tissue that the surgeon removes.

A negative margin is the better result because it means that all the tumor in that area has likely been removed. On the other hand, a positive margin doesn't always mean that you'll have a recurrence.

Surgery can be used as the main (primary) treatment. Or surgery may be only one part of your treatment plan. The type of surgery you receive depends on the size and location of the tumor. It also depends on whether cancer is found in any surrounding organs or tissues.

### Radical prostatectomy

Prostatectomy means removing the prostate gland through surgery. A radical prostatectomy removes not only the entire prostate but also the surrounding tissue, seminal vesicles, and sometimes the nearby lymph nodes. So it can be a highly effective way of curing prostate cancer.

## Shared decision-making

Some people with cancer want their doctors and treatment team to just tell them which treatment to have. Doctors, nurses, and other providers are the experts, right? While it's true that your treatment team has lots of experience and knowledge, you're also an expert—you're the expert on you.

It's a good idea for your team to share the responsibility of your treatment with you. And it's a good idea for you to fully participate in making decisions about your care.

Here's what your treatment team should share with you:

- An explanation of the likely benefits and potential harms of each treatment option.
- The likelihood of cure, recurrence, progression, and possible mortality with each treatment option.
- The side effects of each treatment option along with its impact on quality of life, including sexual, urinary, and bowel function.

And here's what you should share with your treatment team:

- Your preferences and feelings about treatment, side effects, risks, and quality of life. These should be key parts of your treatment plan.

If the provider who's leading your treatment team doesn't have a talk with you about shared decision-making, feel free to speak up and ask about it.





Radical prostatectomy is often used when:

- The tumor is found only in the prostate.
- The tumor can be removed completely with surgery.
- You have a life expectancy of 10 years or more.
- You have no other serious health conditions.

A radical prostatectomy is complex and requires a great deal of skill. Surgeons who are experienced in this type of surgery often have better results.

There are two surgical methods for radical prostatectomy:

- **Open surgery** removes the prostate through a single cut or incision. The incision is long enough to let your doctor directly view and access the tumor to remove it.
- **Minimally invasive surgery** uses several small incisions or holes instead of one larger cut. The surgeon inserts small tools through each incision to perform the surgery. In most centers, the surgeon uses a robot to guide the tools more precisely.

Minimally invasive surgery has become more common than open surgery. Patients who receive minimally invasive surgery may have shorter hospital stays, less blood loss, fewer surgical complications, or faster recovery time. The major side effects from minimally invasive radical prostatectomy—**incontinence** and **erectile dysfunction**—occur about as often as they do with open surgery.

### Side effects of surgery

Radical prostatectomy frequently causes two side effects:

**Urinary incontinence.** After a radical prostatectomy, most people temporarily lose the ability to control when they pee. This is called urinary incontinence and it can be a major problem.

Right after the procedure, a catheter will be inserted into your urethra to allow you to empty your bladder and for your urethra to heal. The catheter will stay in place for 1 to 2 weeks after surgery. You'll be shown how to care for it while at home. If the catheter is removed too early, you may lose control of your bladder or be unable to urinate due to scar tissue.

After the catheter is removed, you may need to use absorbent pads or incontinence underwear for several weeks or months. You can also do exercises that strengthen the pelvic floor muscle. (If you haven't had prostate surgery yet, consider starting pelvic floor exercises beforehand to help to reduce urinary incontinence afterward.) In addition, certain prescription medications can reduce the need to pee so often.

Most patients gradually recover most of the control of their bladder within a year, though many continue to use pads for minor leaks. If incontinence continues to be a major problem, you can have a surgical procedure to control urination.

**Erectile dysfunction.** Erectile dysfunction means having difficulty or being unable to have an erection of the penis. It's a common problem after prostate surgery, but it often—although not always—improves over time.

There's a higher risk for erectile dysfunction if:

- You are older
- You have erectile problems before surgery
- Your cavernous nerves are damaged or removed during surgery

The cavernous nerves control the ability to have erections. These nerves run alongside the prostate. Surgeons do their best to avoid these nerves when performing a

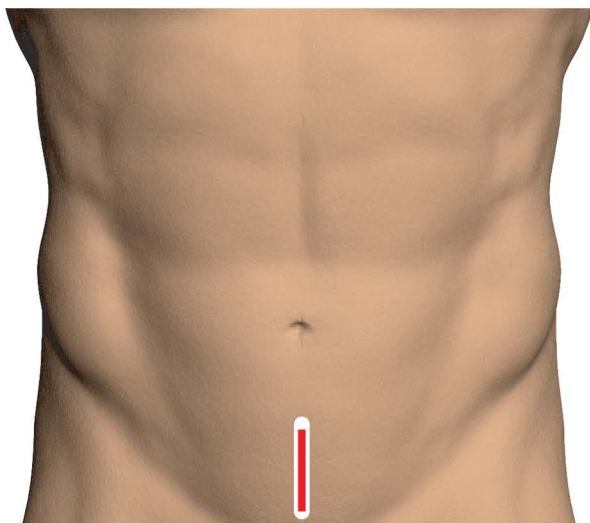
prostatectomy, but damage to the nerves during surgery is sometimes unavoidable.

Removing your prostate and seminal vesicles will cause you to have dry orgasms. This means there will be no semen, which would prevent you from having children. You may want to look into sperm banking before the surgery if you're thinking of having children.

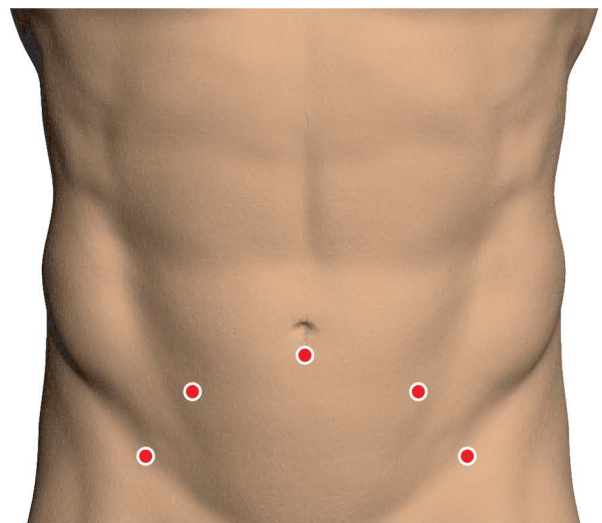
It may take several months to 2 years to restore the erectile function you had before the prostatectomy. However, you may never regain the same erectile function or sex drive you once had. Treatment options for erectile dysfunction include pills (like Viagra and Cialis), injections of medication into the penis, vacuum constriction devices ("penis pump"), and surgical implants that produce an erection.

### Open vs. minimally invasive prostatectomy

**A prostatectomy is an operation that removes the whole prostate. Open surgery removes the prostate through a single cut or incision. Minimally invasive surgery uses several small incisions or holes instead of one larger cut.**



**Open**



**Minimally invasive**

It's also common to have psychological as well as relationship problems with erectile dysfunction. It's a leading cause of depression in patients with prostate cancer. This happens often and is nothing to be ashamed of.

Ask your doctor or someone else on your care team about therapy or counseling if you're having problems due to erectile dysfunction or symptoms of depression. While it may be uncomfortable to talk about these problems, keep in mind that these side effects are common and help is readily available.

## Radiation therapy

Radiation therapy uses high-energy radiation, like x-rays or gamma rays, to kill cancer cells and shrink tumors. Radiation therapy is given in regular doses over a certain period of time.

Radiation can be used instead of surgery to treat cancer. Sometimes, radiation therapy is given after surgery to help prevent your cancer from coming back. Also, if your PSA begins to rise after surgery, radiation therapy might be recommended to try to kill any cancer cells that could have been left behind. One advantage of radiation therapy is that it's less invasive than surgery.

There are two main types of radiation treatment for prostate cancer: radiation from outside the body (external beam radiation therapy) and radiation from inside the body (brachytherapy).

### EBRT

External beam radiation therapy (EBRT) uses a large machine outside the body that aims radiation at cancer inside the body. The radiation is focused directly on the cancer (and on surrounding areas where the cancer could spread), while trying to avoid healthy tissue. This technique delivers higher doses of radiation more safely than radiation therapy in the past.

You won't become radioactive and you can't pass radiation to loved ones with this treatment.

Two forms of EBRT are used for treating prostate cancer. **Photon radiation therapy** delivers high-energy x-rays to destroy cancer cells and stop them from spreading. It's used in the majority of treatments because it's available at more centers. **Proton beam radiation therapy** uses streams of electrically charged particles called protons to precisely target cancer cells. Both are very good at treating prostate cancer and have similar risks of side effects.

Both forms of EBRT require careful planning. A week to several weeks before you start therapy, you'll have a radiation simulation. You won't receive any actual treatment during the simulation. You'll lie on the treatment table and get into the best position for receiving the radiation.

Because you'll need to remain motionless during the treatment, you may be fitted with positioning devices to help you keep still. You'll also have imaging to map the location of the tumor inside your body. This allows your treatment team to calculate the right amount of radiation delivered at the precise spot.

During the treatment itself, the machine may rotate around the treatment table to deliver radiation from several different angles. You won't be able to feel the radiation when it's delivered. A treatment session may take up to an hour, but the actual radiation time will take only a few minutes. Treatments are usually given every day for several days or weeks.

Some treatments require specialized radiation planning and delivery techniques. In certain cases, stereotactic body radiation therapy (SBRT) may be used. SBRT uses precise image-guided targeting to deliver higher doses of radiation in a fewer number of days.

### Brachytherapy

Brachytherapy is an internal form of radiation therapy. In this treatment, radiation is delivered inside the body by placing a radioactive object into or next to the tumor. This can be invasive and is often done as a surgical procedure.

Brachytherapy may be used alone or combined with EBRT, hormone therapy, or both. Patients with high-risk cancers aren't usually considered for brachytherapy alone. You might hear it called brachy (said "bray-key") for short.

**High dose-rate brachytherapy** involves a procedure where 10 to 20 very narrow tubes are inserted through the perineum and into your prostate. Thin wires with radioactive tips slide through the tubes and are held within the prostate for several minutes. During this time, the tips deliver a high dose of radiation to the prostate. The wires are then retracted and the needles are removed, leaving no radioactive material behind.

**Low dose-rate brachytherapy** is delivered by dozens of tiny metal "seeds" that are permanently implanted in your prostate. The seeds gradually release a continuous low dose of radiation over months.

### External beam radiation therapy

External beam radiation therapy (EBRT) uses a machine that precisely aims radiation at cancer inside the body. The radiation beam focuses on the cancer while avoiding healthy tissue. This allows for safer delivery of higher doses of radiation, sometimes with fewer treatments.



## Side effects of radiation therapy

Side effects that occur during or after treatment, called acute side effects, are more common but often temporary. Side effects that occur months to years later, called late side effects, are less common.

Some of the common side effects of radiation therapy are urinary and bowel problems, erectile dysfunction, and fatigue.

**Urinary and bowel problems.** Urinary problems include having to go more often, having to go suddenly, a burning sensation when you go, and sometimes blood in the urine. Bowel problems can include diarrhea, pooping frequently, being unable to hold it in and, rarely, bleeding from the rectum. Urinary and bowel problems usually lessen or go away after several weeks for most people but can last longer for others.

**Erectile dysfunction.** Radiation therapy can damage the nerves that control erections. Erectile dysfunction doesn't happen right away after radiation. It usually occurs gradually, starting and then worsening between 1 to 3 years after radiation treatment. (For more, see "Erectile dysfunction" in the earlier section *Side effects of surgery*, page 40.) Having hormone therapy in addition to radiation therapy can make this side effect more likely.

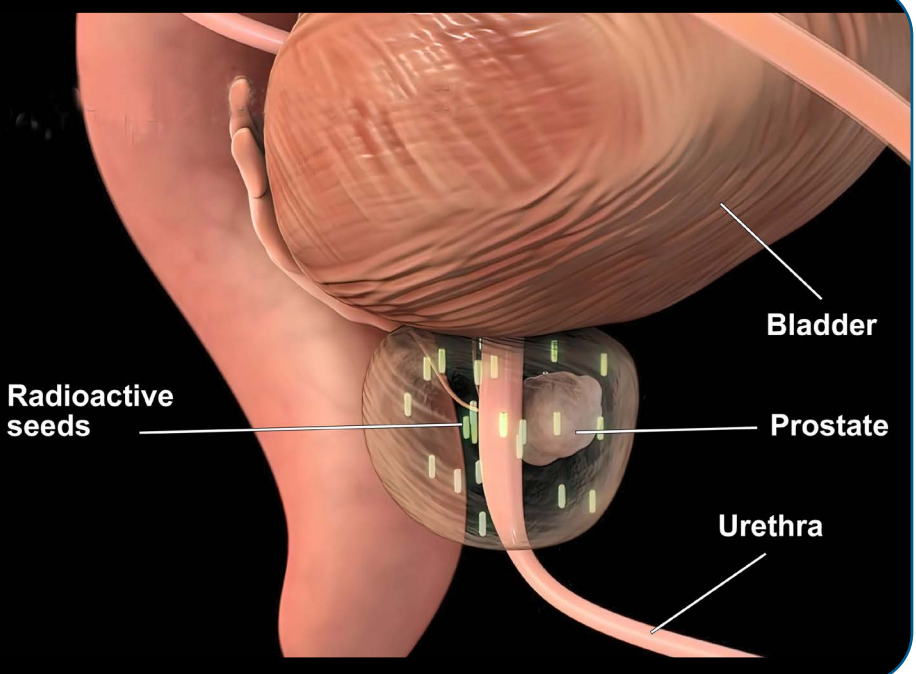
**Fatigue.** Feeling very tired for a few weeks to months after radiation treatment is also common. However, regular physical activity and exercise can help relieve fatigue.

## Hormone therapy

Hormone therapy is rarely used by itself for the treatment of early-stage prostate cancer. When hormone therapy is used (generally for

### Brachytherapy radiation

Low dose-rate brachytherapy uses tiny radioactive metal "seeds" that are implanted into your prostate. Each seed is about the size of a grain of rice. They'll stay in your prostate permanently and provide a low dose of radiation continuously for several months. This treatment strategy spares nearby healthy tissue from unnecessary radiation.



patients with higher risk), it's usually given with radiation therapy, which increases radiation's effectiveness. Hormone therapy may be given before, during, or after radiation therapy.

Hormone therapy is treatment that adds, blocks, or removes hormones. A hormone is a natural chemical made by a gland in the body. Its job is to activate cells or organs.

Male hormones are called androgens. The main androgen is testosterone. Most of the testosterone in the body is made by the testicles. Testosterone helps produce sperm, among other functions. But testosterone also helps prostate cancer grow. A type of hormone therapy called androgen deprivation therapy (ADT) can stop your body from making testosterone or block cancer cells from using testosterone. This can shrink the tumor or slow tumor growth for a while.

You might hear the term “castration” used when describing prostate cancer or its treatment. This term describes a drastic reduction of testosterone. Castration can be a short-term reversible treatment using drugs or it can be permanent surgical removal of one or both testicles (orchiectomy). Though orchiectomy is a surgical procedure, it's still considered hormone therapy because it removes the primary source of testosterone: the testicles. Unlike drug hormone therapy, orchiectomy can't be reversed.

Surgical removal of the testicles is much less common today because drug therapy is often just as effective at blocking testosterone. Orchiectomy is now used only for advanced metastatic prostate cancer.

Hormone therapies for prostate cancer include luteinizing hormone-releasing hormone (LHRH) agonists and LHRH antagonists, both of which cause the testicles to stop making testosterone. Most LHRH agonists and LHRH antagonists are injections. These may be given monthly or 2, 3, or 4 times a year. Anti-androgens, corticosteroids, and androgen synthesis inhibitors are available as pills and taken 1 to 3 times a day, depending on the medication. **See Guide 4.**

### Side effects of hormone therapy

Hormone therapy has significant side effects. Many factors affect your risk for side effects including your age, your health before treatment, how long or often you have treatment, and other things.

In general, the longer you're on hormone therapy, the greater your risk of thinning and weakening of your bones (osteoporosis), bone fractures, weight gain, loss of muscle mass, diabetes, and heart disease. You may need an x-ray scan (DEXA scan) to check your bone density before starting hormone therapy.

Other side effects of hormone therapy include tiredness (fatigue), mood changes, weight gain, and growth and tenderness of your breasts.

Hormone therapy increases the risk for diabetes and cardiovascular disease. If you already have either of these conditions, hormone therapy can cause them to get worse. Hormone therapy may increase the risk of death from heart issues, particularly in Black patients.

In addition, the sexual side effects of hormone therapy are a significant cause of stress. Hormone therapy may lower your desire for sex, cause erectile dysfunction, and reduce the size of the penis and testicles. Erectile dysfunction medicines (such as Viagra and Cialis) aren't usually effective for those on hormone therapy, but other injected medicines may be helpful. These drugs don't restore the loss of sexual desire caused by lower androgen levels.

It may take a year or more to regain your testosterone level and sex drive. Many patients never fully regain the same levels of testosterone and libido that they had before hormone therapy.

Talk to your care team about how to manage the side effects of hormone therapy. They have ways to lessen or soothe most of these problems. Bones can be strengthened with

medicine as well as with physical activity. Exercise and eating a healthy diet can also help with fatigue, mood, and weight gain.

Loss of sex drive, erectile dysfunction, and other sexual side effects usually go away after you stop hormone therapy. In the meantime, consider talking to your partner and/or a therapist to help you deal with any problems you're having.

## Cryotherapy

Cryotherapy, also known as cryosurgery or cryoablation, destroys cancer cells by freezing them.

For this treatment, long hollow needles are inserted through the perineum (the area between the scrotum and anus) and into the prostate. Freezing cold gas is sent through the

### Guide 4

#### Hormone therapy drugs for early-stage prostate cancer

|                                       |  |
|---------------------------------------|--|
| <b>LHRH agonists</b>                  | Eligard (leuprolide), Lupron Depot (leuprolide), Trelstar (triptorelin), Zoladex (goserelin) |
| <b>LHRH antagonists</b>               | Firmagon (degarelix), Orgovyx (relugolix)  |
| <b>Anti-androgens</b>                 | Casodex (bicalutamide), Eulexin (flutamide), Nilandron (nilutamide)                          |
| <b>Corticosteroids*</b>               | methylprednisolone, prednisone   |
| <b>Androgen synthesis inhibitors*</b> | Zytiga (abiraterone)   |

\* Only for patients with very-high-risk prostate cancer

needles to destroy cancer tissue or the entire prostate. Cryotherapy affects only the prostate, leaving the surrounding area unharmed. You'll be given anesthesia to relieve any pain during the procedure.

Cryotherapy is not a standard treatment for newly diagnosed prostate cancer. It's mainly used as a secondary therapy for people with early prostate cancer whose cancer returns after radiation treatment. Side effects of cryotherapy can include pain, erectile dysfunction, and urinary incontinence.

## High-intensity focused ultrasound

Like cryotherapy, high-intensity focused ultrasound isn't a standard treatment for newly diagnosed prostate cancer. It's mainly used for early prostate cancer that returns after radiation treatment.

High-intensity focused ultrasound, or HIFU, destroys prostate tissue with heat generated by high-energy ultrasound waves. For this procedure, an ultrasound probe is inserted into the rectum. The probe focuses high-frequency sound energy on the prostate, leaving the surrounding tissue unaffected. The energy converts into high heat, which vaporizes one portion of tissue at a time until the entire tumor is destroyed.

Side effects of HIFU are usually temporary and include having to pee urgently or more often, or having a weak or slower urine stream. Urinary incontinence and erectile dysfunction are also possible.

## Clinical trials

Therapy may also be given as part of a clinical trial. A clinical trial is a type of medical research study. After being developed and tested in a laboratory, potential new ways of fighting cancer need to be studied in people. If found to be safe and effective in a clinical trial, a drug, device, or treatment approach may be approved by the U.S. Food and Drug Administration (FDA).

Everyone with cancer should carefully consider all of the treatment options available for their cancer type, including standard treatments and clinical trials.

Talk to your doctor about whether a clinical trial may make sense for you.

### Phases

Most cancer clinical trials focus on treatment. Treatment trials are done in phases.

- **Phase 1** trials study the dose, safety, and side effects of an investigational drug or treatment approach. They also look for early signs that the drug or approach is helpful.
- **Phase 2** trials study how well the drug or approach works against a specific type of cancer.
- **Phase 3** trials test the drug or approach against a standard treatment. If the results are good, it may be approved by the FDA.
- **Phase 4** trials study the long-term safety and benefit of an FDA-approved treatment.



### Who can enroll?

Every clinical trial has rules for joining, called eligibility criteria. The rules may be about age, cancer type and stage, treatment history, or general health. These requirements ensure that participants are alike in certain ways in order to compare how their disease responds to a specific treatment.

### Informed consent

Clinical trials are managed by a group of experts called a research team. The research team will review the study with you in detail, including its purpose and the risks and benefits of joining. All of this information is also provided in an informed consent form. This is an agreement that confirms you've been fully told about your part in the trial. Read the form carefully and ask questions before signing it. Take time to discuss it with family, friends, or others you trust. Keep in mind that you can leave and seek treatment outside of the clinical trial at any time.

### Start the conversation

Don't wait for your doctor to bring up clinical trials. Start the conversation and learn about all of your treatment options. If you find a study that you may be eligible for, ask your treatment team if you meet the requirements. If you have already started standard treatment, you may not be eligible for certain clinical trials. Try not to be discouraged if you cannot join. New clinical trials are always becoming available.



**Without clinical trials, our treatment wouldn't change. It would always remain the same. Some people refer to clinical trials as receiving tomorrow's best treatment today."**

### Frequently asked questions

There are many myths and misconceptions surrounding clinical trials. The possible benefits and risks are not well understood by many with cancer.

#### Will I get a placebo?

Placebos (inactive versions of real medicines) are almost never used alone in cancer clinical trials. It is common to receive either a placebo with a standard treatment or a new drug with a standard treatment. You will be informed, verbally and in writing, if a placebo is part of a clinical trial before you enroll.

#### Are clinical trials free?

There's no fee to enroll in a clinical trial. The study sponsor pays for research-related costs, including the study drug. You may, however, have costs indirectly related to the trial, such as the cost of transportation or childcare due to extra appointments. During the trial, you will continue to receive standard cancer care. This care is billed to—and often covered by—your insurance. You are responsible for copays and any costs for this care that are not covered by your insurance.

## Supportive care

Supportive care aims to improve your quality of life. Supportive care (sometimes called palliative care) is health care that relieves the symptoms caused by cancer and the side effects caused by its treatment.

Supportive care addresses many needs: relieving symptoms, preventing or lessening treatment side effects, advising about nutrition and diet, and providing emotional or spiritual support, financial aid, or family counseling. Supportive care can also help with making treatment decisions.

Supportive care is important at any stage of cancer, not just at the end of life. In fact, people who start supportive care when they begin treatment tend to have improved outcomes and better quality of life.

Supportive care involves the whole person, not just their cancer. If you're having a problem that's interfering with your treatment or affecting your quality of life, ask what supportive care resources may be available to help you.

### Support groups

Many people diagnosed with cancer find support groups to be helpful. Support groups often include people at different stages of treatment. Some people may be newly diagnosed, while others may be finished with treatment. If your hospital or community doesn't have support groups for people with prostate cancer, check out the websites listed on page 80 of this book.



## Finding a clinical trial

### In the United States

#### NCCN Cancer Centers

[NCCN.org/cancercenters](https://www.nccn.org/cancercenters)

#### The National Cancer Institute (NCI)

[cancer.gov/about-cancer/treatment/clinical-trials/search](https://www.cancer.gov/about-cancer/treatment/clinical-trials/search)

### Worldwide

#### The U.S. National Library of Medicine (NLM)

[clinicaltrials.gov](https://clinicaltrials.gov)

### Need help finding a clinical trial?

#### NCI's Cancer Information Service (CIS)

1.800.4.CANCER (1.800.422.6237)

[cancer.gov/contact](https://www.cancer.gov/contact)

## Key points

- Active surveillance is the preferred strategy for most patients with lower-risk prostate cancer and a longer life expectancy.
- Surgery removes the tumor along with some normal-looking tissue around its edge called a surgical margin. The goal of surgery is to leave no cancer cells in the surgical margin.
- A radical prostatectomy removes the whole prostate, the surrounding tissue, the seminal vesicles, and sometimes the nearby lymph nodes in the pelvis.
- Radiation can kill cancer cells and stop new cancer cells from being made.
- Hormone therapy treats prostate cancer by stopping testosterone from being made or by blocking cancer cells from using testosterone. It's sometimes used in combination with radiation therapy for early-stage prostate cancer.
- Castration describes a drastic reduction of testosterone. This can be done surgically or with drugs.
- Supportive care is important at any stage of cancer, not just at the end of life.



**When you are deciding on your treatment options, remember that even though some decisions need to be made fast, don't rush. Think through your options and get second, or even third opinions. Have people you can trust to talk through your options so you feel comfortable in your decisions."**

# 5

## Initial treatment for your risk group

- 51 Very low risk
- 53 Low risk
- 55 Intermediate risk
- 55 Favorable intermediate risk
- 57 Unfavorable intermediate risk
- 59 High risk or very high risk
- 62 After treatment
- 63 Key points

**You've had a lot of tests to assess your risk for prostate cancer. You and your care team will now use your risk assessment to decide your initial treatment options.**

Has your doctor or care team told you which risk group you're in?

If you know your risk group, look for it in the following pages to learn about your initial therapy options.

## Very low risk

Patients included in the very-low-risk group have **all** of the following traits:

- Stage T1c tumor
- Grade Group 1
- PSA less than 10 ng/mL
- Cancer in 1 to 2 biopsy cores with no more than half of each core showing cancer
- PSA density less than 0.15 ng/mL

NCCN experts are concerned about overtreatment of early-stage prostate cancer. One result of overtreatment is that the treatment might cause more problems than the disease itself. For many patients, especially those with lower risk prostate cancer, active surveillance or observation can be better options than direct treatment. Treatment options, based on life expectancy, are described next. Also see **Guide 5**.

### Guide 5

#### Very-low-risk group: Initial therapy options

| Life expectancy    | Initial therapy     |
|--------------------|---------------------|
| 10 years or more   | Active surveillance |
| Less than 10 years | Observation         |

**Life expectancy: 10 years or more**

If you have very-low-risk prostate cancer and your life expectancy is 10 years or more, options include:

**Active surveillance**

Active surveillance is the preferred option if you have slow-growing prostate cancer and your life expectancy is 10 years or more. Tests during active surveillance include prostate-specific antigen (PSA), digital rectal exam, MRI scan, and biopsies. These tests are done on a regular basis so that treatment can be started when and if needed. **See Guide 6.**

To see if you're a good candidate for active surveillance, you may need a confirmatory MRI (if you haven't received an MRI already) with or without a confirmatory prostate biopsy. All patients should have a confirmatory prostate biopsy 1 to 2 years after their initial biopsy.

**Life expectancy: Less than 10 years**

If you have very-low-risk prostate cancer and your life expectancy is less than 10 years, observation is often recommended.

**Observation**

This option is for those who have other more serious health problems and whose prostate cancer isn't causing any symptoms. Observation involves occasional PSA tests and watching for symptoms, which can be treated with palliative therapy.

**Guide 6  
Tests during active surveillance**

| Test                   | Frequency                          |
|------------------------|------------------------------------|
| PSA test               | Once or twice a year, or as needed |
| Digital rectal exam    | Once a year, or as needed          |
| Repeat MRI             | Every 1 to 2 years, or as needed   |
| Repeat prostate biopsy | Every 2 to 5 years, or as needed   |

## Low risk

The low-risk group includes patients who have all of the following traits:

- Stage T1 to T2a tumor
- Grade Group 1
- PSA of less than 10 ng/mL
- Cancer found in more than 3 biopsy cores, but fewer than half of all cores show cancer

Treatment options are based on life expectancy. The initial treatment options for low-risk disease are described next and shown in **Guide 7** on the next page.

### Life expectancy: 10 years or more

If you have low-risk prostate cancer and your life expectancy is 10 years or more, initial treatment options are:

#### Active surveillance

Active surveillance is the preferred option if you have slow-growing disease and you have a longer life expectancy. **See Guide 6.**

To see if you're a good candidate for active surveillance, you may need a confirmatory MRI (if you haven't received an MRI already) with or without a confirmatory prostate biopsy and/or molecular biomarker testing. All patients should have a confirmatory prostate biopsy 1 to 2 years after their initial biopsy.

#### Radiation therapy

If you'll likely live more than 10 years, you may decide you want treatment now instead of active surveillance. Low-risk cancers can be treated with radiation therapy, either external beam radiation therapy (EBRT) or brachytherapy.

#### Prostate surgery

Prostate surgery (radical prostatectomy) removes the whole prostate. It's not a common treatment option for people with low-risk prostate cancer.

In certain cases when prostate surgery is chosen for a patient with low-risk prostate cancer, the pathologist will look for signs of disease called adverse (or high-risk) features. **See Guide 8** on the next page. If your prostate cancer has adverse features after prostate surgery, then you'll be monitored or perhaps have additional treatment to prevent the cancer from returning. If test results don't show adverse features, then you can be monitored for cancer recurrence.

### Life expectancy: Less than 10 years

If you have low-risk prostate cancer and your life expectancy is less than 10 years, observation is often recommended.

#### Observation

Observation is for those who have other more serious health problems and whose prostate cancer isn't causing any symptoms. Observation involves occasional PSA tests and watching for symptoms, which can be treated with palliative therapy.

## Guide 7

### Low-risk group: Initial therapy options

| Life expectancy    | Initial therapy                           | Additional therapy   |
|--------------------|---|--|
| 10 years or more   | Active surveillance (preferred)           |  |
|                    | Radiation therapy (EBRT or brachytherapy) |  |
|                    | Prostate surgery                          | → Monitoring for cancer recurrence<br>If needed,* additional treatment may include EBRT and/or hormone therapy |
| Less than 10 years | Observation                               |  |

\* See Guide 8 for adverse features

## Guide 8

### Adverse features

**If tests show you have any of these high-risk features after prostate surgery, you may need additional therapy:**

- Cancer in the normal-looking tissue removed with the tumor (surgical margin)
- Cancer outside the layer surrounding the prostate
- Cancer in the seminal vesicle(s)
- Cancer in the lymph nodes
- A detectable level of PSA



## Intermediate risk

The intermediate-risk group is for those who don't have high-risk or very-high-risk group features but do have **one or more** of the following intermediate risk factors:

- Stage T2b or T2c tumor
- Grade Group 2 or 3
- PSA 10 to 20 ng/mL

The intermediate-risk group is further divided into favorable and unfavorable subgroups. Treatment is based on whether your prostate cancer is **favorable intermediate** risk or **unfavorable intermediate** risk:

**NCCN experts are concerned about overtreatment of early-stage prostate cancer. In certain cases, overtreatment may cause more problems than the cancer itself.**



## Favorable intermediate risk

The favorable intermediate-risk subgroup is for those who have **all** of the following traits:

- 1 intermediate risk factor
- Grade Group 1 or 2
- Less than half of biopsy cores show cancer

Treatment options are based on life expectancy. **See Guide 9** on the next page.

### **Life expectancy: 10 years or more**

If you have favorable intermediate-risk prostate cancer and your life expectancy is 10 years or more, there are three initial treatment options:

#### **Active surveillance**

Active surveillance consists of testing on a regular basis so that treatment can be started when needed. For favorable intermediate-risk disease, you should be watched closely for any changes. **See Guide 6.**

To see if you're a good candidate for active surveillance, you may need a confirmatory MRI (if you haven't received an MRI already) with or without a confirmatory prostate biopsy and/or molecular biomarker testing.

Patients in the favorable intermediate-risk group who have a low percentage of Gleason pattern 4 cancer, low tumor volume, low PSA density, and/or low genomic risk (according to a molecular tumor analysis) are particularly good candidates for active surveillance.

**Radiation therapy**

Radiation therapy is a treatment option for some patients with favorable-intermediate risk. Radiation treatments include either EBRT or brachytherapy.

**Prostate surgery**

If you're expected to live 10 years or more, surgically removing your prostate (radical prostatectomy) may be an option. Your pelvic lymph nodes may also be removed if there's a small risk for cancer to spread to them. Your urologist will determine this risk using a nomogram. A surgical procedure called a pelvic lymph node dissection (PLND) is performed to remove the nodes and check them for cancer.

You might have additional treatment after prostate surgery to help prevent the cancer from returning. This is called adjuvant therapy. Adjuvant therapy options are based on whether high-risk (adverse) features are found as a result of prostate surgery. Having adverse features suggests that not all of the cancer was removed during surgery. **See Guide 8.**

If test results don't find high-risk features after prostate surgery, then you'll be monitored for recurrence of cancer. Monitoring involves periodic PSA tests and sometimes digital rectal exams. If your PSA level rises during monitoring, you'll have further tests to see if the cancer has returned.

**Guide 9**

**Favorable intermediate-risk group: Initial therapy options**

| Life expectancy  | Initial therapy   | Additional therapy   |
|------------------|---|--|
| 10 years or more | Active surveillance (preferred)                               |  |
|                  | Radiation therapy   |  |
|                  | Prostate surgery with or without pelvic lymph node dissection | → Monitoring for cancer recurrence<br>If needed,* additional treatment may include EBRT and/or hormone therapy |
| 5 to 10 years    | Observation (preferred)                                       |  |
|                  | Radiation therapy   |  |

\* See Guide 8 for adverse features

### **Life expectancy: Between 5 and 10 years**

If you have favorable intermediate-risk prostate cancer and your life expectancy is between 5 and 10 years, there are two treatment options:

#### **Observation**

Observation is the preferred option for those with a life expectancy of 5 to 10 years and whose prostate cancer isn't causing symptoms. Observation involves occasional PSA tests and watching for symptoms, which can be treated with palliative therapy.

#### **Radiation therapy**

Radiation therapy is a treatment option for some with favorable-intermediate risk. Radiation treatments include either EBRT or brachytherapy.

## **Unfavorable intermediate risk**

The unfavorable intermediate-risk subgroup is for those who have one or more of the following:

- 2 or more intermediate-risk factors
- Grade Group 3
- More than half of biopsy cores show cancer

Treatment options are based on life expectancy. Treatment options for patients with unfavorable intermediate-risk cancer are shown in **Guide 10** on the next page.

### **Life expectancy: 10 years or more**

If you have unfavorable intermediate-risk prostate cancer and your life expectancy is 10 years or more, your initial treatment options include radical prostatectomy or radiation and hormone therapy.

#### **Prostate surgery**

Surgically removing your prostate (radical prostatectomy) may be an option. Your pelvic lymph nodes may also be removed if there's a small risk for cancer to spread to them. Your urologist will determine this risk using a nomogram. A surgical procedure called a pelvic lymph node dissection (PLND) is performed to remove the nodes and check them for cancer.

You may receive additional treatment after surgery to help stop the cancer from returning. This is called adjuvant therapy. Adjuvant therapy will be started after you've healed from your prostate surgery. The choice of adjuvant therapy is based on whether your cancer has high-risk (adverse) features and/or lymph node metastasis. **See Guide 8.** Having adverse features suggests that not all the cancer was removed during prostate surgery.

If test results don't find high-risk features after prostate surgery, then you'll be monitored for recurrence of cancer. Monitoring involves periodic PSA tests and sometimes digital rectal exams. If your PSA level rises during

monitoring, you'll have further tests to see if the cancer has returned.

**Radiation and hormone therapy**

Radiation therapy plus hormone therapy is also an initial treatment option for those with unfavorable intermediate risk and life expectancy of 10 years or more. Radiation therapy can be EBRT or brachytherapy, along with 4 to 6 months of hormone therapy.

**Guide 10**

**Unfavorable intermediate-risk group: Initial therapy options**

| Life expectancy  | Initial therapy   | Additional therapy   |
|------------------|---|--|
| 10 years or more | Prostate surgery with or without pelvic lymph node dissection | → Monitoring for cancer recurrence<br>If needed,* additional treatment may include EBRT and/or hormone therapy |
|                  | Radiation therapy and hormone therapy                         |  |
| 5 to 10 years    | Observation   |  |
|                  | Radiation therapy (EBRT or brachytherapy) and hormone therapy |  |

\* See Guide 8 for adverse features

## Life expectancy: Between 5 and 10 years

If you have unfavorable intermediate-risk prostate cancer and your life expectancy is 5 to 10 years, your treatment options include:

### Observation

Because the cancer may progress too slowly to cause problems within 5 to 10 years, active surveillance is not recommended for patients in this risk group. Observation is the recommended option instead. Observation involves occasional PSA tests and watching for symptoms, which can be treated with palliative therapy.

### Radiation and hormone therapy

Radiation therapy plus hormone therapy is also a treatment option for those in the unfavorable-intermediate risk group. Treatment includes EBRT or brachytherapy, plus 4 to 6 months of hormone therapy.

## High risk or very high risk

The **high-risk group** includes those who have **only one** of the following characteristics:

- Stage T3a tumor
- Grade Group 4
- Grade Group 5
- PSA of more than 20 ng/mL

More than half of the biopsy cores show cancer, but fewer than 4 cores are Grade Group 4 or 5

The **very-high-risk group** includes those who have **one or more** of the following characteristics:

- Stage T3b to T4 tumor
- Primary Gleason pattern 5
- 2 or more high-risk factors
- More than 4 biopsy cores that are Grade Group 4 or 5

Those who have high-risk or very-high-risk cancer and are expected to live 5 years or less should undergo bone imaging to see if the cancer has spread to any bones. Imaging of your abdomen and pelvis is also important to look for cancer in the lymph nodes and areas besides the prostate.

Treatment is more aggressive for high-risk and very-high-risk prostate cancer. Treatment options are based on life expectancy and whether or not you have symptoms. **See Guide 11** on the next page.

**Life expectancy: More than 5 years or you have symptoms**

If your life expectancy is more than 5 years or you have symptoms, there are several options for initial therapy:

**Radiation therapy**

Radiation therapy combined with long-term hormone therapy is an effective initial treatment for patients at high risk or very high risk. For this option, hormone therapy is given

before, during, and after radiation therapy for 18 months to 3 years.

Another radiation therapy option is EBRT, brachytherapy, and long-term hormone therapy (1 to 3 years). Combining EBRT and brachytherapy allows for more careful control of the radiation dose. When hormone therapy is added to this combination, patient outcomes tend to improve.

**Guide 11**

**High-risk and very-high-risk groups: Initial therapy options**

| Life expectancy                                 | Initial therapy   | Additional therapy   |
|---|---|--|
| <b>More than 5 years or you have symptoms</b>   | Radiation therapy and hormone therapy   |  |
|   | Radiation therapy, hormone therapy, and Zytiga (abiraterone) only for very-high-risk patients |  |
|   | Prostate surgery with or without pelvic lymph node dissection                                 | → Monitoring for cancer recurrence<br>If needed,* additional treatment may include EBRT and/or hormone therapy |
| <b>5 years or less and you have no symptoms</b> | Observation   |  |
|   | Hormone therapy   |  |
|   | Radiation therapy (EBRT)  |  |

\* See Guide 8 for adverse features

There's also a radiation treatment option just for patients with very-high-risk prostate cancer: Zytiga (abiraterone) can be combined with radiation therapy and 2 years of hormone therapy.

### Prostate surgery

If you're expected to live more than 5 years, a radical prostatectomy with the removal of your pelvic lymph nodes (pelvic lymph node dissection, or PLND) is an option for patients in the high-risk group and certain patients in the very-high-risk group. Your age and overall health will be factors in deciding if this is a good option for you.

You may receive additional treatment after prostate surgery to help prevent the cancer from returning. Treatment will be started after you've healed from the prostate surgery. Options for additional treatment after a prostatectomy are based on whether you have adverse (high-risk) features and/or cancer in the lymph nodes after prostate surgery. **See Guide 8.**

If test results find no adverse features, no additional treatment is needed. Your cancer will be monitored. Monitoring involves periodic PSA tests and sometimes digital rectal exams. If your PSA level begins to rise during monitoring, you may need treatment for PSA recurrence. *See Chapter 7.*

If test results find adverse features but no cancer in the lymph nodes after surgery, the preferred option is being monitored for cancer recurrence. EBRT (with or without hormone therapy) is also an additional treatment option. EBRT targets areas where the cancer cells have likely spread. Hormone therapy might be added to EBRT to improve outcomes.



**It's OK to have bad days, but don't let yourself stay there. A positive attitude goes a long way."**

If cancer has spread to your lymph nodes but there are no other adverse features, then monitoring is a reasonable option if your PSA level is undetectable. However, if your PSA level begins to rise during monitoring, you may need treatment for PSA recurrence. Hormone therapy (with or without EBRT) is also an option for additional therapy. You might start the hormone therapy right away with the option of adding radiation therapy later. *See Chapter 7: Making treatment decisions.*

## Life expectancy: 5 years or less and no symptoms

There are three options for high-risk or very-high-risk prostate cancer when life expectancy is 5 years or less and you have no symptoms:

### Observation

Observation is the option for most people in these higher-risk groups. Observation involves occasional PSA tests and watching for symptoms, which can be treated with palliative therapy. **See Guide 11.**

### Hormone therapy

If observation isn't a good fit, hormone therapy is an option. Hormone therapy can be medical or surgical castration. Medical castration is treatment with drugs to drastically reduce male hormones. Surgical castration is the permanent surgical removal of one or both testicles (orchiectomy).

### Radiation therapy

EBRT is an option because it's been shown to be effective in patients with high-risk and very-high-risk prostate cancer.

### Supportive care

In addition to these treatments, you may also receive supportive care (palliative care). Supportive care is for relieving the symptoms caused by cancer and the side effects caused by its treatment.

## After treatment

After your initial treatment and your additional treatment, if needed, you'll be monitored for any increase in PSA or cancer recurrence. Monitoring involves these follow-up tests:

- ▶ PSA test every 6 to 12 months for 5 years, then once a year after that (For patients with a high risk of recurrence, PSA testing every 3 months may be better)
- ▶ Digital rectal exam, if your doctor suspects cancer recurrence

If lymph node metastases are found while you're on hormone therapy or under observation, or if your PSA (and digital rectal exam, if performed) indicates the cancer has returned, then you'll have additional imaging and discussions of your options. Options may include ongoing monitoring or additional (or different) treatment. *See Chapter 6: PSA persistence and recurrence.*



## Key points

- ▶ NCCN experts are concerned about overtreatment of early-stage prostate cancer. For many patients with lower risk prostate cancer, observation or active surveillance can be better options than direct treatment.
- ▶ All patients choosing active surveillance should have a confirmatory prostate biopsy 1 to 2 years after their initial biopsy.
- ▶ Adjuvant therapy is additional treatment after initial therapy that helps prevent cancer from returning.
- ▶ If there's a risk that cancer has spread or will spread to lymph nodes within the pelvis, then a surgical procedure called a pelvic lymph node dissection (PLND) is performed to remove the lymph nodes and check them for cancer.
- ▶ After a radical prostatectomy, additional (adjuvant) treatment may help prevent the cancer from returning. The choice of adjuvant treatment is based on whether there are adverse (high-risk) features and/or cancer in the lymph nodes after the surgery.
- ▶ Treatment is more aggressive for high-risk and very-high-risk cancer. For those who choose surgery, adjuvant treatment with radiation therapy is often needed. Sometimes long-term hormone therapy is also added to improve outcomes.
- ▶ If your PSA level begins to rise after initial treatment, you may need treatment for PSA recurrence.

# 6

## PSA persistence and recurrence

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- 69 Key points

**Even after treatment with prostate surgery or radiation therapy, your PSA level may not go down low enough. Or your PSA level may drop but, at some point, begin to rise again. These are usually signs that you'll need further treatment.**

If you had a radical prostatectomy, all the cells that make PSA should be gone, so your PSA level should be undetectable. If you had radiation therapy, your PSA level should fall steadily to near zero.

But in about 1 in 3 people with prostate cancer, their PSA level either doesn't drop low enough (called PSA persistence) or it drops to near zero but eventually starts to rise again (called PSA recurrence). PSA recurrence may not happen for several years after initial treatment.

PSA persistence and PSA recurrence may be signs that the cancer hasn't fully gone away or that it has come back in other parts of the body. For these reasons, treatment for PSA persistence and PSA recurrence often includes both local and systemic (whole-body) therapies. The local therapy is usually radiation, while systemic therapy involves hormone treatment.

Most of the treatment options listed in this chapter are for those with a life expectancy of more than 5 years. For those with a life expectancy of 5 years or less, observation and/or supportive care (palliative therapy) may be more reasonable options than undergoing treatment.

## Testing for persistence or recurrence

Before deciding on any treatment, you'll need some more tests to find out how aggressive the cancer may be. Imaging is used to find out whether cancer has returned in the pelvis or another area of the body.

- **PSA doubling time** – This test measures the time that the PSA level takes to double. If it doubles in a short amount of time (6 months or less, for example), it suggests that the cancer is growing quickly.
- **Imaging** – This often includes imaging the whole body.
- **Biopsy** – If your PSA is elevated or imaging shows possible cancer somewhere, you may need a biopsy of that area. A biopsy may be needed in the prostate after radiation, in the prostate bed after surgery, or somewhere else like the seminal vesicles, a lymph node, or a bone.

## Treatment for persistence or recurrence

If your life expectancy is more than 5 years, treatment for PSA persistence or PSA recurrence is based on whether your previous treatment was radical prostatectomy or radiation therapy. **See Guide 12** on the next page.

### After prostate surgery

If you have PSA persistence or PSA recurrence and your initial therapy was radical prostatectomy, your next treatment depends on your latest test results:

#### No other cancer found

If your PSA level is up but tests don't find cancer in lymph nodes in the pelvis or anywhere else in the body, the preferred treatment is radiation therapy with or without hormone therapy. Monitoring is an option for certain patients.

#### Cancer in the pelvis

If tests find cancer in lymph nodes in the pelvis, then you may be given radiation therapy, possibly combined with hormone therapy. Additional hormone therapy with abiraterone may also be included.

#### Cancer in another area of the body

If tests find that cancer has spread to another area of the body, it means the cancer has metastasized and needs more advanced treatment. See the *NCCN Guidelines for Patients: Advanced-Stage Prostate Cancer*.

### After radiation therapy

If you have PSA recurrence and your initial treatment was radiation therapy, your next treatment depends on your latest test results:

#### No other cancer found

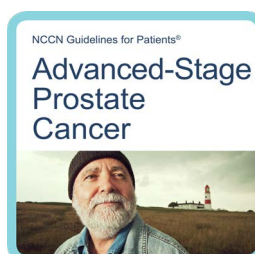
If your PSA level is up but tests don't find cancer in pelvic lymph nodes or anywhere else in the body, you may have another biopsy or simply be monitored with regular testing. If symptoms appear or treatment is needed, you may be given hormone therapy or a radical prostatectomy, if appropriate. Other, non-surgical options include cryotherapy, high-intensity focused ultrasound (HIFU), or more radiation therapy.

#### Cancer in the pelvis

If tests find cancer in lymph nodes in the pelvis, your options include monitoring or treatment with hormone therapy (with or without abiraterone). Other treatment options (given with or without hormone therapy) include radiation or dissection of pelvic lymph nodes.

#### Cancer in another area of the body

If tests find that cancer has spread to another area of the body, that means the cancer has metastasized and needs more advanced treatment. See the *NCCN Guidelines for Patients: Advanced-Stage Prostate Cancer* available at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](#) app.



**Guide 12****Treatment for PSA persistence or PSA recurrence**

| <b>Initial therapy</b>       | <b>Test results</b>  | <b>Treatment options for persistence or recurrence</b>   |
|------------------------------|--|--|
| <b>Radical prostatectomy</b> | No other signs of cancer                                     | <ul style="list-style-type: none"> <li>• Radiation therapy with or without hormone therapy (preferred)</li> <li>• Monitoring</li> </ul>  |
|                              | Cancer in pelvic lymph nodes                                 | <ul style="list-style-type: none"> <li>• Radiation therapy and hormone therapy with or without abiraterone</li> </ul>  |
|                              | Cancer has spread to another area of the body (metastasized) | <ul style="list-style-type: none"> <li>• Advanced treatment required</li> </ul>  |
| <b>Radiation therapy</b>     | No other signs of cancer                                     | <ul style="list-style-type: none"> <li>• Biopsy</li> <li>• Monitoring</li> <li>• Hormone therapy</li> <li>• Radical prostatectomy</li> <li>• Cryotherapy</li> <li>• High-intensity focused ultrasound</li> <li>• More radiation therapy</li> </ul>   |
|                              | Cancer in pelvic lymph nodes                                 | <ul style="list-style-type: none"> <li>• Biopsy</li> <li>• Monitoring</li> <li>• Hormone therapy with or without abiraterone</li> <li>• Radiation therapy of pelvic lymph nodes with or without hormone therapy</li> <li>• Dissection of pelvic lymph nodes with or without hormone therapy</li> </ul> |
|                              | Cancer has spread to another area of the body (metastasized) | <ul style="list-style-type: none"> <li>• Advanced treatment required</li> </ul>  |

## What's next?

After you've been treated for PSA persistence or PSA recurrence, you'll continue to have tests and visits to treat your existing cancer or to watch out for cancer to return. Surveillance is a key part of your follow-up plan. Be sure to continue to go to follow-up visits and stay in touch with your treatment team.

If the cancer comes back again but doesn't spread beyond the pelvis, you can continue to have treatment for persistence/recurrence. If the cancer comes back again but spreads to another area of the body, you'll need more advanced treatment. See the *NCCN Guidelines for Patients: Advanced-Stage Prostate Cancer*. As always, you can ask to join a clinical trial.

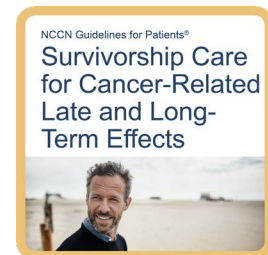
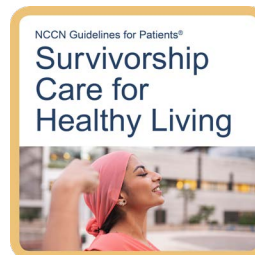
It's common to feel frustration, anger, regret, despair, and uncertainty—even all at the same time. Know that you can have prostate cancer and still enjoy living after diagnosis and treatment. Try to take as much pleasure in life as possible. Talk with family or friends. Join a support group to learn how other patients are dealing with their cancer. Or talk to your doctor or another member of your care team. They can point you to professionals who can help you deal with these feelings and guide you toward your next steps.

## Survivorship

Survivorship focuses on the health and well-being of a person with cancer, from diagnosis until the end of life. This includes the physical, mental, emotional, social, and financial effects that begin at diagnosis, continue through treatment, and arise afterward.

Survivorship also includes concerns about follow-up care, late effects of treatment, cancer recurrence, and quality of life. Support from family members, friends, and caregivers is also an important part of survivorship.

Read more about survivorship in the *NCCN Guidelines for Patients: Survivorship Care for Healthy Living* and *Survivorship Care for Cancer-Related Late and Long-Term Effects*, available at [NCCN.org/patientguidelines](https://www.nccn.org/patientguidelines) and on the [NCCN Patient Guides for Cancer](https://www.nccn.org/patientguidelines) app.



## Key points

- After treatment for prostate cancer, some people have PSA persistence (PSA level doesn't drop low enough) or PSA recurrence (PSA level drops but starts to rise again).
- PSA persistence and PSA recurrence may be signs that cancer hasn't fully gone away or that it may come back in other parts of the body.
- For those with PSA persistence or recurrence and a life expectancy of 5 years or less, observation may be a more reasonable option than undergoing treatment.
- If tests find that cancer has spread to another area of the body, that means the cancer has metastasized and needs more advanced treatment.
- You can have prostate cancer and still enjoy life after diagnosis and treatment.



### **We want your feedback!**

**Our goal is to provide helpful and easy-to-understand information on cancer.**

**Take our survey to let us know what we got right and what we could do better.**

[NCCN.org/patients/feedback](https://www.nccn.org/patients/feedback)

# 7

## Making treatment decisions

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**It's important to be comfortable with the cancer treatment you choose. This choice starts with having an open and honest conversation with your care team about the benefits and risks of treatment.**

## It's your choice

Treatment decisions are very personal. What is important to you may not be important to someone else. In shared decision-making, you and your providers share information, discuss the options, and agree on a treatment plan. Be clear about your goals for treatment and find out what to expect from treatment. It starts with an open and honest conversation between you and your team.

Some things that may play a role in your decision-making:

- What you want and how that might differ from what others want
- Your religious and spiritual beliefs
- Your feelings about certain treatments like surgery or hormone therapy
- Your feelings about pain or side effects
- Cost of treatment, travel to treatment centers, and time away from school or work
- Quality of life and length of life
- How active you are and the activities that are important to you

Think about what you want from treatment. Discuss openly the risks and benefits of specific treatments and procedures. Weigh options and share concerns with your care team.

## Second opinion

It's normal to want to start treatment as soon as possible. While cancer treatment shouldn't be ignored, there is usually time to have another cancer care provider review your test results and suggest a treatment plan. This is called getting a second opinion, and it's a normal part of cancer care. Even doctors get second opinions!

Seek out a prostate cancer specialist, if you can, because they have experience diagnosing and treating a lot of people with your type of cancer.

Things you can do to prepare:

- Check with your insurance company about its rules on second opinions. There may be out-of-pocket costs to see providers who are not part of your insurance plan.
- Make plans to have copies of all your records sent to the doctor you will see for your second opinion.

## Questions to ask

Possible questions to ask your cancer care team are listed on the following pages. Feel free to use these or come up with your own. Have a notebook handy to jot down the answers to your questions.



















## Resources

### **AnCan Foundation**

[ancan.org](http://ancan.org)

### **Bag It**

[bagitcancer.org](http://bagitcancer.org)

### **Cancare**

[Cancare.org](http://Cancare.org)

### **CancerCare**

[cancercares.org](http://cancercares.org)

### **Cancer Hope Network**

[cancerhopenetwork.org](http://cancerhopenetwork.org)

### **FORCE: Facing Our Risk of Cancer Empowered**

[facingourrisk.org](http://facingourrisk.org)

### **Imerman Angels**

[imermanangels.org](http://imermanangels.org)

### **Malecare**

[malecare.org](http://malecare.org)

### **National Alliance of State Prostate Cancer Coalitions (NASPCC)**

[naspcc.org](http://naspcc.org)

### **National Coalition for Cancer Survivorship**

[canceradvocacy.org](http://canceradvocacy.org)

### **PCaAware National Prostate Cancer Awareness Foundation**

[pcaaware.org](http://pcaaware.org)

### **Prostate Conditions Education Council (PCEC)**

[prostateconditions.org](http://prostateconditions.org)

### **Prostate Health Education Network (PHEN)**

[prostatehealthd.org](http://prostatehealthd.org)

### **Triage Cancer**

[triagecancer.org](http://triagecancer.org)

### **ZERO Prostate Cancer**

[zerocancer.org](http://zerocancer.org)



## Words to know

### **active surveillance**

Frequent and ongoing testing to watch for changes in cancer status so treatment can be started if needed.

### **androgen deprivation therapy (ADT)**

Hormone therapy that stops the body from making testosterone or blocks cancer cells from using testosterone. ADT can be given through drugs or surgery.

### **anti-androgen**

A drug that stops the action of the hormone testosterone.

### **biopsy**

A procedure that removes fluid or tissue samples to be tested for disease.

### **brachytherapy**

A treatment with radiation from an object placed near or in the tumor. Also called internal radiation.

### **castration**

Surgery that removes the testicles or drugs that suppress the function of the testicles to keep testosterone levels low or close to zero.

### **computed tomography (CT)**

An imaging test that uses x-rays from many angles to make a picture of the inside of the body.

### **digital rectal exam**

An exam of the prostate by feeling it through the wall of the rectum.

### **enlarged prostate**

An overgrowth of tissue in the prostate that isn't caused by cancer. Also sometimes called benign prostatic hyperplasia.

### **erectile dysfunction**

A lack of blood flow to the penis that limits getting or staying erect.

### **external beam radiation therapy (EBRT)**

A treatment in which a machine outside the body aims radiation precisely at cancer inside the body.

### **genetic abnormality**

An abnormal change in the cell's instructions for making and controlling cells. Also called a mutation.

### **Gleason score**

A rating of how much prostate cancer cells look like normal cells under the microscope.

### **Grade Group**

Like a Gleason score, a Grade Group is a rating of how much prostate cancer cells look like normal cells under the microscope. Grade Groups are meant to be easier to use than Gleason scores.

### **hormone therapy**

A cancer treatment that stops the making or action of hormones. Also called androgen deprivation therapy.

### **life expectancy**

The number of years a person is likely to live based on statistics of other people in similar circumstances.

### **luteinizing hormone-releasing hormone (LHRH) agonist**

A drug that acts in the brain to stop the testicles from making testosterone.

**luteinizing hormone-releasing hormone (LHRH) antagonist**

A drug that acts in the brain to stop the testicles from making testosterone.

**magnetic resonance imaging (MRI)**

A test that uses radio waves and powerful magnets to make pictures of the insides of the body.

**metastasis**

The spread of cancer from the site where it started to a new site.

**nerve-sparing radical prostatectomy**

An operation that removes the prostate and one or neither cavernous nerve bundle.

**nomogram**

A mathematical tool that uses health information to predict an outcome.

**observation**

A period of watching for cancer growth or occurrence while not receiving treatment.

**orchiectomy**

An operation to reduce testosterone in the body by removing one or both testicles.

**palliative therapy**

Health care for the symptoms of cancer or the side effects of cancer treatment. Palliative therapy is an important part of supportive care.

**pathologist**

A doctor who specializes in testing cells and tissue to find disease.

**pelvic lymph node dissection (PLND)**

An operation that removes lymph nodes between the hip bones.

**perineum**

The body region between the scrotum and anus.

**positron emission tomography (PET)**

A test that uses radioactive material to see the shape and function of body parts.

**prostate-specific antigen (PSA)**

A protein made by the prostate that helps semen transport sperm. PSA is measured in nanograms per milliliter of blood (ng/mL).

**PSA density**

The level of PSA—a prostate-made protein—in relation to the size of the prostate.

**PSA persistence**

When PSA level is still detectable after prostate cancer treatment.

**PSA recurrence**

When PSA level drops after prostate cancer treatment but then rises again.

**radiation therapy**

Treatment that uses high-energy rays (radiation) to kill cancer cells.

**radical prostatectomy**

An operation that removes the entire prostate as well as surrounding tissue, seminal vesicles, and sometimes lymph nodes.

**recurrence**

The return of cancer after a disease-free period.

**risk factor**

Something that increases the chance of getting a disease.

**seminal vesicle**

One of two male glands that makes fluid used by sperm for energy.

**staging**

The process of rating the extent of cancer in the body.

**supportive care**

Health care other than curative treatment that supports the physical, emotional, social, and spiritual needs of patients, families, and caregivers.

**surgical margin**

The normal-looking tissue around a tumor that is removed during an operation.

**testosterone**

A hormone that helps male sexual organs to work.

**ultrasound**

A test that uses sound waves to take pictures of the inside of the body.

**urethra**

A tube that carries urine from the bladder to outside the body through the penis. It also expels semen.

**urinary incontinence**

A condition in which the release of urine can't be controlled.



**Take our survey and help make the  
NCCN Guidelines for Patients  
better for everyone!**

[NCCN.org/patients/comments](https://www.nccn.org/patients/comments)

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# NCCN Cancer Centers

**Abramson Cancer Center**  
at the University of Pennsylvania  
Philadelphia, Pennsylvania  
800.789.7366 • [pennmedicine.org/cancer](http://pennmedicine.org/cancer)

**Case Comprehensive Cancer Center/  
University Hospitals Seidman Cancer Center and  
Cleveland Clinic Taussig Cancer Institute**  
Cleveland, Ohio  
UH Seidman Cancer Center  
800.641.2422 • [uhhospitals.org/services/cancer-services](http://uhhospitals.org/services/cancer-services)  
CC Taussig Cancer Institute  
866.223.8100 • [my.clevelandclinic.org/departments/cancer](http://my.clevelandclinic.org/departments/cancer)  
Case CCC  
216.844.8797 • [case.edu/cancer](http://case.edu/cancer)

**City of Hope National Medical Center**  
Duarte, California  
800.826.4673 • [cityofhope.org](http://cityofhope.org)

**Dana-Farber/Brigham and Women's Cancer Center |  
Mass General Cancer Center**  
Boston, Massachusetts  
877.442.3324 • [youhaveus.org](http://youhaveus.org)  
617.726.5130 • [massgeneral.org/cancer-center](http://massgeneral.org/cancer-center)

**Duke Cancer Institute**  
Durham, North Carolina  
888.275.3853 • [dukecancerinstitute.org](http://dukecancerinstitute.org)

**Fox Chase Cancer Center**  
Philadelphia, Pennsylvania  
888.369.2427 • [foxchase.org](http://foxchase.org)

**Fred & Pamela Buffett Cancer Center**  
Omaha, Nebraska  
402.559.5600 • [unmc.edu/cancercenter](http://unmc.edu/cancercenter)

**Fred Hutchinson Cancer Center**  
Seattle, Washington  
206.667.5000 • [fredhutch.org](http://fredhutch.org)

**Huntsman Cancer Institute at the University of Utah**  
Salt Lake City, Utah  
800.824.2073 • [healthcare.utah.edu/huntsmancancerinstitute](http://healthcare.utah.edu/huntsmancancerinstitute)

**Indiana University Melvin and Bren Simon  
Comprehensive Cancer Center**  
Indianapolis, Indiana  
888.600.4822 • [www.cancer.iu.edu](http://www.cancer.iu.edu)

**Mayo Clinic Comprehensive Cancer Center**  
Phoenix/Scottsdale, Arizona  
Jacksonville, Florida  
Rochester, Minnesota  
480.301.8000 • Arizona  
904.953.0853 • Florida  
507.538.3270 • Minnesota  
[mayoclinic.org/cancercenter](http://mayoclinic.org/cancercenter)

**Memorial Sloan Kettering Cancer Center**  
New York, New York  
800.525.2225 • [mskcc.org](http://mskcc.org)

**Moffitt Cancer Center**  
Tampa, Florida  
888.663.3488 • [moffitt.org](http://moffitt.org)

**O'Neal Comprehensive Cancer Center at UAB**  
Birmingham, Alabama  
800.822.0933 • [uab.edu/onealcancercenter](http://uab.edu/onealcancercenter)

**Robert H. Lurie Comprehensive Cancer Center  
of Northwestern University**  
Chicago, Illinois  
866.587.4322 • [cancer.northwestern.edu](http://cancer.northwestern.edu)

**Roswell Park Comprehensive Cancer Center**  
Buffalo, New York  
877.275.7724 • [roswellpark.org](http://roswellpark.org)

**Siteman Cancer Center at Barnes-Jewish Hospital  
and Washington University School of Medicine**  
St. Louis, Missouri  
800.600.3606 • [siteman.wustl.edu](http://siteman.wustl.edu)

**St. Jude Children's Research Hospital/  
The University of Tennessee Health Science Center**  
Memphis, Tennessee  
866.278.5833 • [stjude.org](http://stjude.org)  
901.448.5500 • [uthsc.edu](http://uthsc.edu)

**Stanford Cancer Institute**  
Stanford, California  
877.668.7535 • [cancer.stanford.edu](http://cancer.stanford.edu)

**The Ohio State University Comprehensive Cancer Center -  
James Cancer Hospital and Solove Research Institute**  
Columbus, Ohio  
800.293.5066 • [cancer.osu.edu](http://cancer.osu.edu)

**The Sidney Kimmel Comprehensive  
Cancer Center at Johns Hopkins**  
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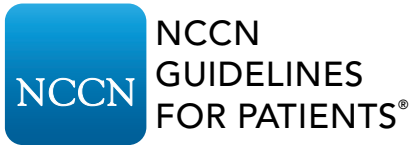
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