



National
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NCCN Guidelines for Patients®

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Prostate Cancer



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Prostate Cancer

Prostate cancer is the most common type of cancer in men living in the United States. Learning that you have prostate cancer can feel overwhelming. The goal of this book is to help you get the best cancer treatment. This book presents which cancer tests and treatments are recommended by experts in prostate cancer.

The National Comprehensive Cancer Network® (NCCN®) is a not-for-profit alliance of 27 of the world's leading cancer centers. Experts from NCCN have written treatment guidelines for prostate cancer doctors. These treatment guidelines suggest what the best practice is for cancer care. The information in this patient book is based on the guidelines written for doctors.

This book focuses on the treatment of prostate cancer. Key points of the book are summarized in the related **NCCN Quick Guide™**. NCCN also offers patient books on colon and lung cancers as well as other cancer types. Visit NCCN.org/patients for the full library of patient books, summaries, and other resources.

NCCN aims to improve the care given to patients with cancer. NCCN staff work with experts to create helpful programs and resources for many stakeholders. Stakeholders include health providers, patients, businesses, and others. One resource is the series of books for patients called the NCCN Guidelines for Patients®. Each book presents the best practice for a type of cancer. The patient books are based on clinical practice guidelines written for cancer doctors. These guidelines are called the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®). Clinical practice guidelines list the best health care options for groups of patients. Many doctors use them to help plan cancer treatment for their patients.

Panels of experts create the NCCN Guidelines®. Most of the experts are from NCCN Member Institutions. Panelists may include surgeons, radiation oncologists, medical oncologists, and patient advocates. Recommendations in the NCCN Guidelines are based on clinical trials and the experience of the panelists. The NCCN Guidelines are updated at least once a year. When funded, the patient books are updated to reflect the most recent version of the NCCN Guidelines for doctors. For more information about the NCCN Guidelines, visit NCCN.org/clinical.asp.

NCCN Foundation® gratefully acknowledges:

California Prostate Cancer Coalition (CPCC) CPCC is pleased to endorse this important resource. We believe it to be the most understandable and comprehensive guide for men diagnosed with prostate cancer who want to really understand what the disease is about and what their specific treatment options are. prostatecalif.org

Malecare Cancer Support

Malecare Cancer Support group members know that nothing is more perplexing than prostate cancer treatment choice making. The NCCN Patient Guidelines provides an excellent starting point for discussion, particularly for African Americans who die from prostate cancer at twice the rate as Caucasian men. malecare.org

National Alliance of State Prostate Cancer Coalitions (NASPCC) NASPCC strongly endorses the NCCN Guidelines for Patients: Prostate Cancer, as an invaluable resource for patients and others. It is a reliable wealth of important information about prostate cancer, in a readable and understandable format. nasppc.org

PCaAware

Today fewer than 47% of men recognize the lethal consequences of avoiding an annual prostate examination and blood test. Guidelines for Patients play a critical role in our focus to make men – and the women in their lives – aware of the need to be pro-active in the fight against this deadly disease. Breaking down the “wall of silence” that surrounds men and prostate cancer is a goal that can be achieved when men choose to be aware and take action. pcaaware.org

PROSTATE CONDITIONS EDUCATION COUNCIL (PCEC) Having a tool that helps to provide an overview of all the treatment options available to patients is critical in winning the fight against prostate cancer. The NCCN guidelines aid in this important step. prostateconditions.org

ZERO - The End of Prostate Cancer

Every 19 minutes a man loses his battle with prostate cancer. NCCN's Guidelines for Patients is a premier resource in helping men and their families to be proactive and make informed decisions. By advancing research, encouraging action, and providing education and support, we can create Generation ZERO — the first generation of men free from prostate cancer. zerocancer.org

Supported by NCCN Foundation®



NCCN Foundation supports the mission of the National Comprehensive Cancer Network® (NCCN®) to improve the care of patients with cancer. One of its aims is to raise funds to create a library of books for patients. Learn more about the NCCN Foundation at NCCN.org/foundation.

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Prostate Cancer

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Who should read this book?

This book is about treatment for an adenocarcinoma of the prostate. About 98 out of 100 men with prostate cancer have an adenocarcinoma. Women don't get prostate cancer because they don't have a prostate. Patients and those who support them—caregivers, family, and friends—may find this book helpful. It may help you discuss and decide with doctors what care is best.

Where should I start reading?

Starting with **Part 1** may be helpful. It explains what prostate cancer is. Knowing more about prostate cancer may help you better understand its treatment. To learn how doctors plan treatment, read **Parts 2** and **3**.

Parts 4 through 7 address prostate cancer treatment. **Part 4** briefly describes the treatments. **Parts 5 through 7** are guides to treatment options. **Part 8** gives tips for making treatment decisions.

Does the whole book apply to me?

This book includes information for many situations. Your treatment team can help. They can point out what information applies to you. They can also give you more information. As you

read through this book, you may find it helpful to make a list of questions to ask your doctors.

The recommendations in this book are based on science and the experience of NCCN experts. However, these recommendations may not be right for you. Your doctors may suggest other tests and treatments based on your health and other factors. If other suggestions are given, feel free to ask your treatment team questions.

Making sense of medical terms

In this book, many medical words are included. These are words that you will likely hear from your treatment team. Most of these words may be new to you, and it may be a lot to learn.

Don't be discouraged as you read. Keep reading and review the information. Don't be shy to ask your treatment team to explain a word or phrase that you do not understand.

Words that you may not know are defined in the text or in the *Dictionary*. Words in the *Dictionary* are underlined when first used on a page.

Acronyms are also defined when first used and in the *Glossary*. Acronyms are short words formed from the first letters of several words. One example is PSA for prostate-specific antigen.

Prostate cancer basics



The prostate

The prostate is a gland that makes a white-colored fluid. Sperm mixes with this fluid and other fluids to form semen. Semen is ejected from the body through the penis during ejaculation. The fluid from the prostate protects sperm from the acid inside a woman's vagina.

As shown in **Figure 1**, the prostate is located below the bladder near the base of the penis. Urine from the bladder travels through the urethra, which passes through the prostate and into the penis. Above the prostate and behind the bladder are two seminal vesicles. Seminal vesicles are also glands that make a fluid that is part of semen.

Inside the prostate, 30 to 50 small sacs make and hold the white-colored fluid. The fluid travels in ducts to the urethra during ejaculation. Around the sacs and ducts is connective tissue.

The prostate begins to form while a baby is inside his mother's womb. After birth, the prostate keeps growing and reaches nearly full size during puberty. At this point, it is about the size of a walnut.

Testosterone causes the prostate to grow slowly in most men. However, the prostate may grow to a large size in some men and cause problems passing urine.

Figure 1.
The prostate

The prostate gland makes a fluid that is part of semen.

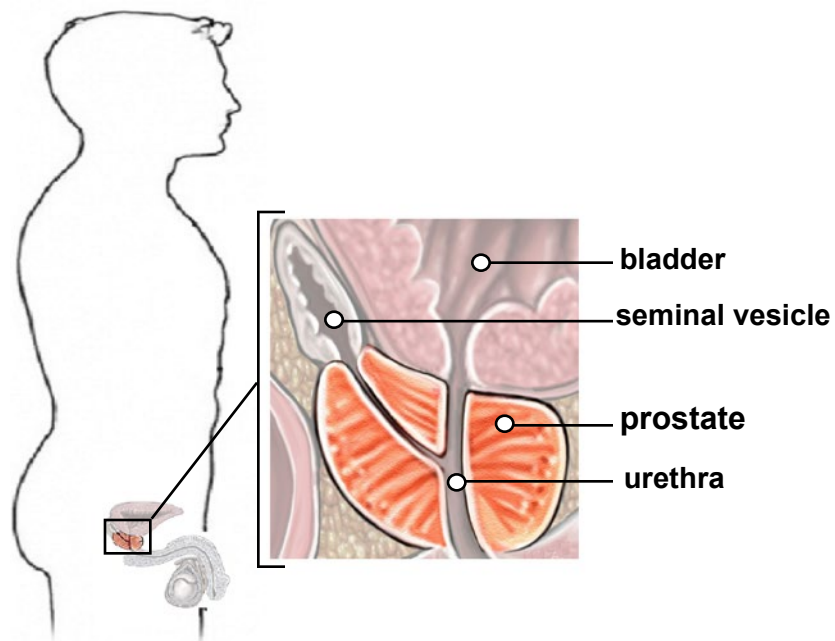


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A disease of cells

Cancer is a disease of cells. Inside of cells are coded instructions for building new cells and controlling how cells behave. These instructions are called genes. Genes are a part of DNA (deoxyribonucleic acid), which is grouped together into bundles called chromosomes. **See Figure 2.** Prostate cancer occurs when normal cells begin to grow faster or die slower. Either pattern causes a tumor to form. Some prostate cancers occur from abnormal changes, called mutations, in genes.

Aging, being of African-American descent, and having family members with prostate cancer have been linked to a higher chance of getting prostate cancer. Other related factors include contact with Agent Orange, obesity, smoking, and poor diet. Not all men with these conditions get prostate cancer and some men without these conditions do. Prostate cancer is common among older men. However, prostate cancer in older men often doesn't become a problem.

Almost all prostate cancers are adenocarcinomas. Adenocarcinomas are cancers that start in cells that line glands and, in the case of prostate cancer, make semen. Adenocarcinomas of the prostate are the focus of this book.

Cancer's threat

Cancer cells don't behave like normal cells in three key ways. First, prostate cancer cells grow more quickly and live longer than normal cells. Normal cells grow and then divide to form new cells when needed. They also die when old or damaged as shown in **Figure 3.** In contrast, cancer cells make new cells that aren't needed and don't die quickly when old or damaged. Over time, cancer cells form a mass called the primary tumor.

The second way cancer cells differ from normal cells is that they can grow into (invade) other tissues. If not treated, the primary tumor can grow large and take over most of the prostate. It can also grow beyond the prostatic capsule and invade nearby tissues. This growth is called extracapsular extension.

Third, unlike normal cells, cancer cells can leave the prostate. This process is called metastasis. In this process, cancer cells break away from the tumor and merge with blood or lymph. Lymph is a clear fluid that gives cells water and food and contains germ-fighting blood cells. Then, the cancer cells travel in blood or lymph through vessels to other sites. In other sites, the cancer cells may form secondary tumors, replace many normal cells, and cause major health problems.

Most men with prostate cancer will not die of this disease. However, prostate cancer is the second most common cause of death from cancer in men. Most prostate cancers grow slowly but some grow and spread quickly. Doctors describe these latter cancers as "aggressive." Why some prostate cancers grow fast is unknown and is being studied by researchers.

Figure 2. Genetic material in cells

Most human cells contain the “blueprint of life”—the plan by which our bodies are made and work. The plan is found inside of chromosomes, which are long strands of DNA that are tightly wrapped around proteins. Genes are small pieces of DNA that contain instructions for building new cells and controlling how cells behave. Humans have about 24,000 genes. Some prostate cancers occur from abnormal changes in genes called mutations.

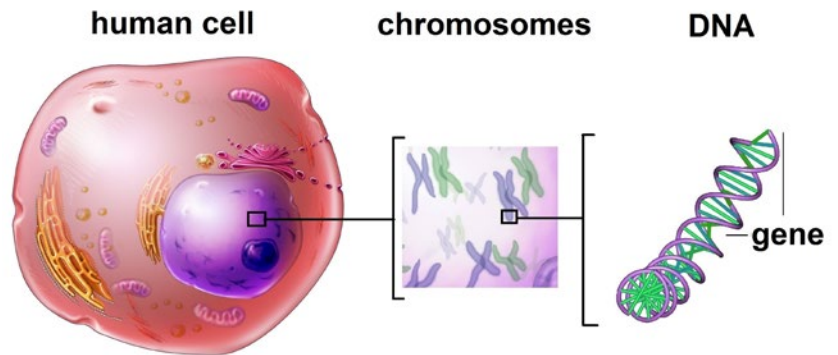
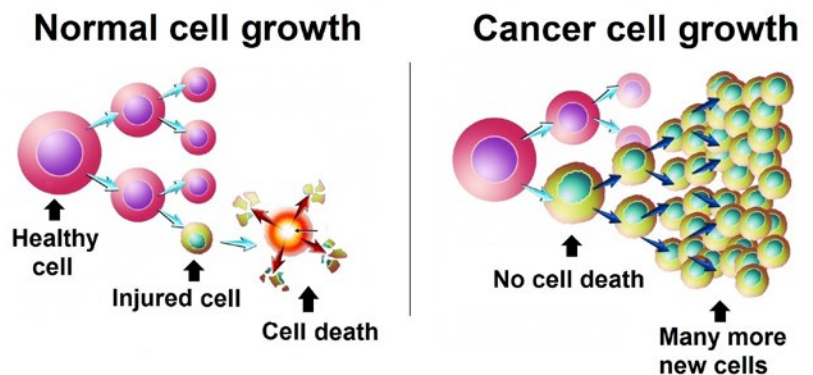


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Figure 3. Normal cell growth vs. cancer cell growth

Normal cells increase in number when they are needed and die when old or damaged. In contrast, cancer cells quickly make new cells and live longer because of abnormal changes in genes.



Cancer staging



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A cancer stage is a rating by your doctors of how far the cancer has grown and spread. There are 4 stages of prostate cancer. Staging is based on test results. Doctors plan additional tests and treatment based on how much the cancer has grown. In Part 2, the tests and scoring system used for staging prostate cancer are explained.

Prostate-specific antigen

PSA (prostate-specific antigen) is a protein made by the fluid-making cells that line the small glands inside the prostate. These cells are where most prostate cancers start. PSA turns semen that has clotted after ejaculation back into a liquid.

PSA can be measured from a blood sample since some of it enters the bloodstream. PSA values are used for cancer staging, treatment planning, and checking treatment results. PSA values discussed in this book include:

- **PSA level** is the number of nanograms of PSA per milliliter (ng/mL) of blood.
- **PSA density** is the PSA level in comparison to the size of the prostate. It is calculated by dividing the PSA level by the size of the prostate. The size of the prostate is measured with a **TRUS** (transrectal ultrasound).
- **PSA velocity** is how much PSA levels change within a period of time.
- **PSA doubling time** is the time it takes for the PSA level to double.

The larger the prostate, the more PSA it can make. Large prostates can be a result of cancer or other health problems of the prostate. Some medicines can also affect the PSA level. PSA increases after ejaculations and vigorous exercise, especially running or bicycling. Thus, refrain from sex and exercise for 3 days before a PSA test. Then the PSA test will be more exact.

Digital rectal exam

Doctors use a DRE (**d**igital **r**ectal **e**xam) to screen for cancer, rate the cancer stage, and assess treatment results. For this exam, your doctor will put a glove on his or her hand and then put lubricant on his or her index finger. Next, your doctor will insert a finger into your rectum to feel your prostate as shown in **Figure 4**. Your prostate can be felt since it is on the other side of the rectal wall. Bear in mind that not all parts of the prostate can be felt on this exam.

Figure 4. Digital rectal exam

Your prostate can be felt through the wall of your rectum. A digital rectal exam is a procedure during which your doctor will insert a finger into your rectum to feel your prostate.

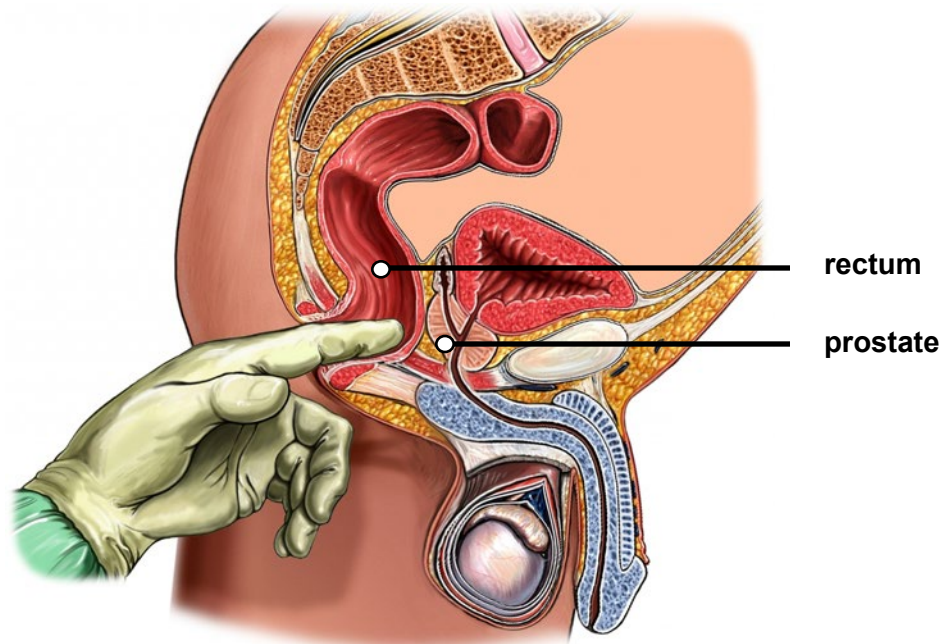


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Prostate MRI

Imaging tests make pictures (images) of the insides of your body. **MRI** (magnetic resonance imaging) uses a magnetic field and radio waves to make images. A 3T, multi-parametric MRI of your prostate may help pinpoint where the cancer is in the pelvis and assess features of the cancer. The short name for this test is mpMRI.

Prostate MRI can be used at many points of care. It is sometimes used for biopsies as discussed next. Prostate MRI may also be used to help decide whether to start and continue active surveillance. Active surveillance is briefly described in Part 4. Part 5 shows when it is an option for initial treatment. Another use for prostate MRI is to assess if you have cancer when other tests, given after treatment, suggest there's cancer. Read Part 6 for more information.

For MRI, you will need to lie on a table and be fitted with coil devices that emit radio waves. An endorectal coil may be used. However, the need for endorectal coil is debated among experts. Instead of using a coil, newer methods to improve images are being tested.

An endorectal coil is a thin wire that is inserted into your rectum. To prepare for endorectal MRI, you may be asked to eat less and clean your bowel with an enema. A cover will be placed over the coil and gel will be applied before insertion. Once inserted, the device will be inflated to hold it in place.

During the MRI, you will be inside the MRI machine. Straps may be used to help you stay in place. You may be given a sedative beforehand if you feel nervous about the test. The machine makes loud noises but you can wear earplugs. After MRI, you will be able to resume your activities right away unless you took a sedative.



Prostate biopsy

Rising PSA levels and abnormal DRE findings may suggest cancer is present. However, the only way to know if you have prostate cancer is to remove tissue from your body and have a pathologist look at it using a microscope. A biopsy removes small samples of tissue for testing. Biopsies can also help your doctor assess how far the cancer has grown.

A prostate biopsy is a type of biopsy that removes tissue from the prostate. To prepare for the biopsy, your doctor may say to stop taking some medicines and start taking others. Medicines to stop taking include blood thinners like warfarin (Coumadin®) or antiplatelet drugs like aspirin or Plavix®. Your doctor may prescribe antibiotics to try to prevent an infection from the biopsy.

Right before the biopsy, local anesthesia may be given to numb the area. You'll feel a small needle stick and a little burning with some pressure for less than a minute. A numbing gel may also be applied to the area. You may feel pressure and discomfort during the biopsy but pain is often little or none.

The most common type of prostate biopsy is the transrectal method. To make sure the best samples are removed, a TRUS probe is inserted into your rectum. The TRUS uses sound waves to make a picture of your prostate that is seen by your doctor on a screen.

A newer method uses MRI along with TRUS. Before the biopsy, images with MRI will be made. These images will then be combined with TRUS during the biopsy. This allows for better tracking of the movement of your prostate. It also helps doctors pinpoint which tissue to remove. At present, this use of MRI is not common practice. More research is needed.

A spring-loaded needle will be inserted through the TRUS. Your doctor will trigger the needle to go through the rectal wall and into your prostate. The needle removes tissue about the length of a dime and the width of a toothpick. At least 12 samples—called cores—are often taken. This is done to check for cancer in different areas of the prostate. Prostate biopsies aren't perfect tests. They sometimes miss cancer when it's there. If no cause for the high PSA is found, your doctor may order more biopsies.

Prostate biopsies often occur with no problems. However, side effects are possible. Some people have allergic reactions to anesthesia. Tell your doctor if you've had any problems with anesthesia in the past. The prostate biopsy may cause:

Often

- Blood in your semen (hematospermia) or urine (hematuria),
- Rectal bleeding,

Sometimes

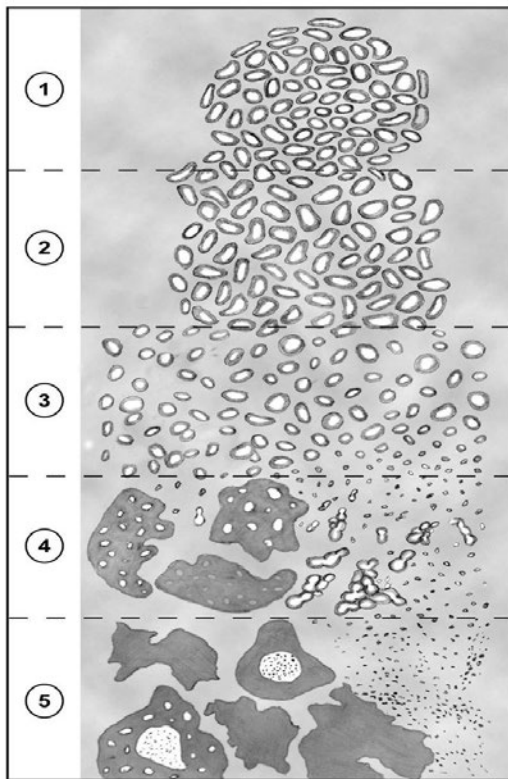
- Infection,

Rarely

- Swelling of your prostate (prostatitis) or epididymis (epididymitis),
- Inability to empty your bladder (urinary retention), and
- Hospitalization.

Figure 5. Gleason grades

To obtain a Gleason score, doctors first assign the cancer two Gleason grades. The grades are combined to obtain a Gleason score. Gleason grades range from 1 to 5.



Glands are small, well-formed, and close together. There are only small signs of cancer.

Glands are larger and have more space in between them.

Glands are even further apart, are darker, and have different shapes.

There are hardly any glands. Cancer cells have lost their ability to form glands. Clumps of cancer cells are invading other tissue.

Often, there are no glands. There are sheets of cancer cells throughout the tissue.

Brunbaugh

Used with permission from Jonathan I. Epstein, M.D.

Chart 1. Gleason score summary

Gleason score	What does the score mean?
2–6	The cancer is likely to grow and spread very slowly. If the cancer is small, many years may pass before it becomes a problem. Thus, you may never need cancer treatment.
7	The cancer is 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 is needed.
8–10	The cancer is likely to grow and spread fast. If the cancer is small, a few years may pass before the cancer becomes a problem. To prevent problems, treatment is needed now.

TNM scores

The AJCC (American Joint Committee on Cancer) staging system is used to stage prostate cancer. In this system, the letters T, N, and M describe a different location of cancer growth. Your doctors will assign a score to each letter. These scores will be combined to assign a cancer stage.

TNM scores are very important for treatment planning. NCCN experts decide options for initial treatment partly based on these scores. See Part 5.

T = Tumor

The T score is a rating of the size and extent of the primary tumor. T1 tumors can't be felt or seen with imaging tests. They are found in tissue removed by biopsies or surgical treatment. For example, prostate cancer may be found in men who had an abnormal [PSA level](#) or who had an operation for urinary problems caused by an enlarged prostate. Prostate cancer discovered as a result of an operation for voiding problems is called an incidental finding.

- **T1a** means that incidental cancer was found in 5% or less of the removed tissue.
- **T1b** means that incidental cancer was found in more than 5% of the removed tissue.
- **T1c** tumors are found by needle [biopsy](#) that was done for a high PSA level.

T2 tumors can be felt by your doctor during a [DRE](#). They also may be seen with an imaging test. T2 scores are based on cancer growth within the lobes—the left and right halves of the prostate. T2 tumors haven't grown outside the prostate gland.

- **T2a** tumors haven't grown beyond half of one lobe.
- **T2b** tumors have grown beyond half of one lobe but not to the other lobe.
- **T2c** tumors have grown into both lobes.

T3 tumors have grown outside the prostate. They have reached the connective tissue around the prostate, the [seminal vesicles](#), or the neck of the bladder. **See Figure 6.**

- **T3a** tumors have grown outside the prostate but not into the seminal vesicle(s).
- **T3b** tumors have grown outside the prostate and into the seminal vesicle(s).

T4 tumors are fixed to or have invaded other nearby tissues. Such tissues include the external sphincter, rectum, bladder, levator muscles, and pelvic wall.

- **T4** tumors are fixed to or have grown into nearby tissues other than seminal vesicles.

N = Nodes

[Lymph](#) drains from around prostate cells into vessels that transport it to the bloodstream. As lymph travels, it passes through small, oval-shaped structures called [lymph nodes](#). Lymph nodes remove germs from lymph. As shown in **Figure 7**, lymph nodes and vessels are found throughout the body.

The N category reflects if cancer cells have spread through lymph to nearby lymph nodes. Nearby lymph nodes include the hypogastric, obturator, internal and external iliac, and sacral lymph nodes. Most often, prostate cancer spreads to the external iliac, internal iliac, or obturator nodes. N scores for prostate cancer include:

- **NX** means it is unknown if there is cancer in lymph nodes.
- **N0** means that there is no cancer within the nearby lymph nodes.
- **N1** means that the cancer has spread into the nearby lymph nodes.

Figure 6.
Areas of tumor growth outside the prostate

The primary tumor may grow through the prostate and into nearby organs.

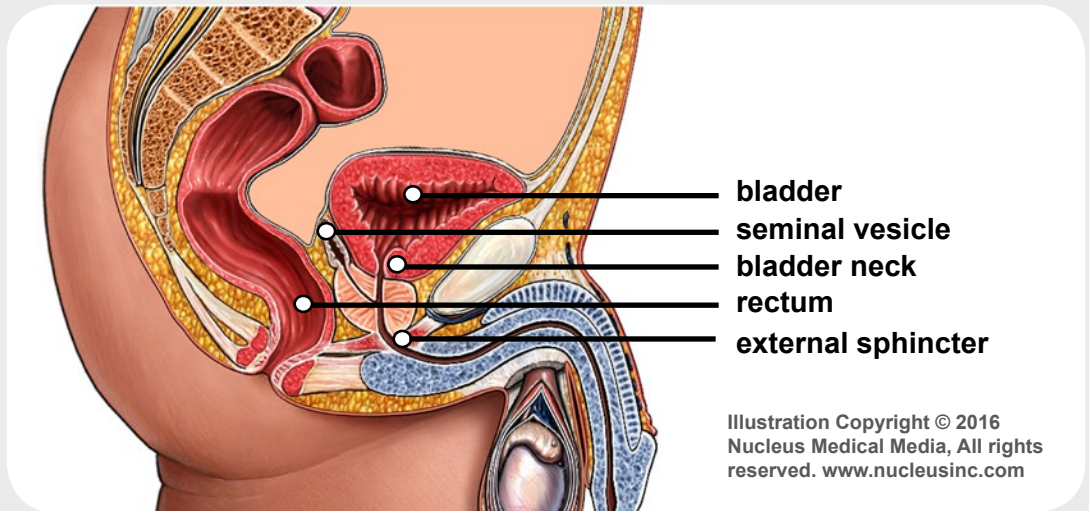
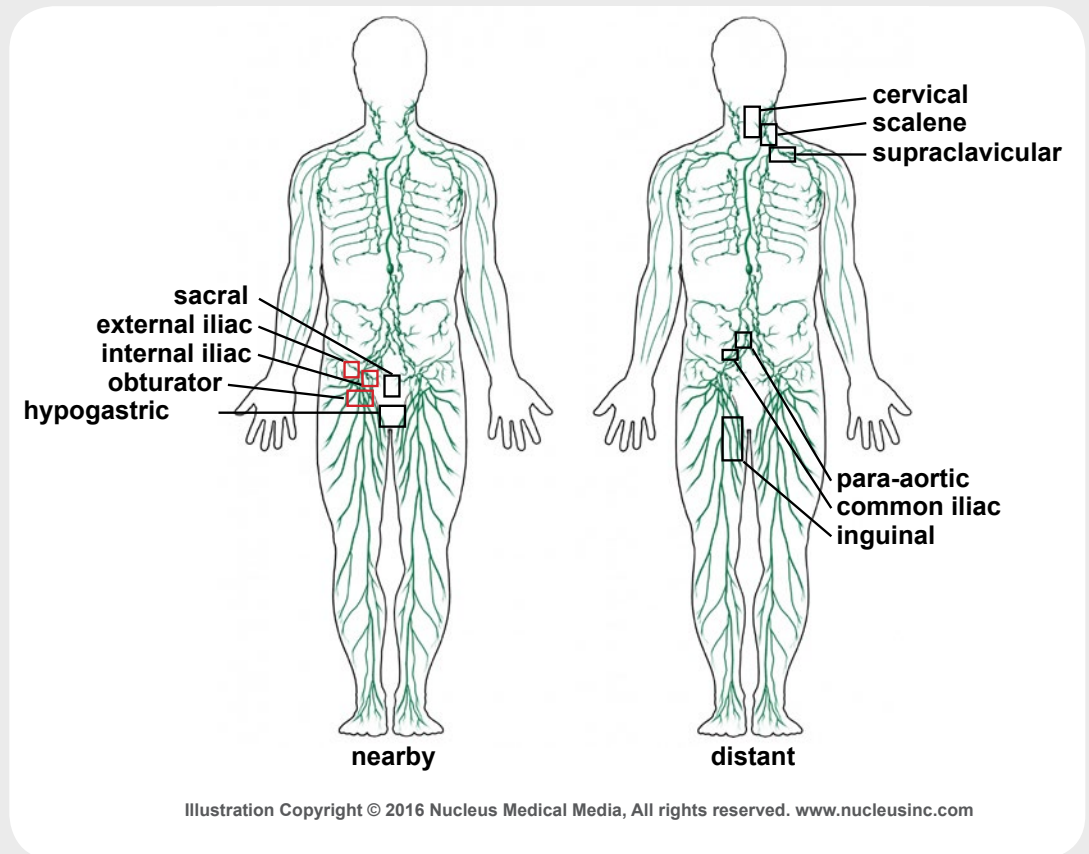


Figure 7.
Cancer spread to lymph nodes

Throughout your body is a network of vessels that transport lymph to the bloodstream. Lymph is a clear fluid that contains germ-fighting blood cells. As lymph travels in vessels, it passes through lymph nodes, which remove germs from lymph. Prostate cancer can spread to lymph nodes near to and distant from the prostate.



M = Metastasis

The M category tells you if the cancer has spread to distant sites. Para-aortic, common iliac, inguinal, supraclavicular, scalene, and cervical lymph nodes are distant from the prostate. Prostate cancer tends to metastasize to bone then the lungs and liver.

M scores for prostate cancer include:

- **MX** means it is unknown if cancer has spread to distant sites.
- **M0** means that there is no growth to distant sites.

- **M1** means that the cancer has spread to distant sites.
 - **M1a** is cancer that has spread to distant lymph nodes.
 - **M1b** is cancer that has spread to bone(s).
 - **M1c** is cancer that has spread to distant organs.

Review

- Prostate cancer is grouped into 4 stages.
- Cancer stages are defined by the growth and spread of the tumor.
- PSA, DRE, and a prostate biopsy can help doctors assess the size of a tumor.
- The Gleason score is a grading system for how much prostate cancer cells retain their ability to form glands.

- Doctors rate the extent of prostate cancer with T, N, and M scores. The T score is a rating of size and extent of the primary tumor. The N score reflects if the cancer has spread to nearby lymph nodes. The M score reflects if the cancer has spread to distant sites.

Treatment Planning



3 Treatment planning

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There are many sources of information that doctors use to plan treatment. Such sources include the tests and the grading and staging systems that were described in Part 2. The side effects of treatment that are listed in Part 4 and your personal preferences are other sources. Here, in Part 3, three more sources that doctors use are explained.

Life expectancy

To help assess what tests and treatments you need, your doctor may determine the number of years you will likely live. These years are called your life expectancy. It may be hard to talk with your doctor about how long you might live. However, this information is very important for your health care.

Prostate cancer often grows slowly. If you're likely to die of other causes, having more tests and cancer treatment may have little or no benefit. Likewise, if the cancer isn't causing symptoms, there may be no benefit to having more tests.

How many years you may live is estimated with two sources of information. First, research on the general population tells how long the average man may live based on his age. See Part 8 for website information. The second source is your general health.

If you're in excellent health, the number of life years from the general population research is increased by half. If you're in poor health, the number of years

is decreased by half. If you have average health, no change is made. **See Figure 8** for examples. This method may correctly predict length of life for a large group of men, but it can't predict without a doubt what will happen to you. Even so, it gives a starting point for suggesting treatment options.

Most prostate cancers diagnosed in America are found using PSA and are slow growing. Growth of prostate cancer can be estimated with tests. You and your doctor should begin talking about prostate cancer by comparing your life expectancy versus the threat to you by the prostate cancer.

Figure 8. Life expectancy

To help assess what tests and treatments you need, your doctor may determine the number of years you will likely live. These years are called your life expectancy. How many years a man is likely to live depends on his age and health.



Risk assessment

To plan the best treatment for you, your doctors will like to know:

- If and how far the cancer has spread,
- How fast the cancer will grow,
- How the cancer will respond to treatment, and
- Whether cancer will re-appear on tests after treatment (called a recurrence).

However, this information often can only be known over time or after cancer treatment has started. As such, your doctors will assess your chances (also called risk) for such events. Risk groups and nomograms are two tools that doctors use. Molecular testing is a newer tool that needs more research.

Risk groups

Risk groups divide people with cancer into smaller subsets based on their chances of an event. Some risk groups are based on one piece of information while others use multiple pieces of information. In Part 5, treatment options are presented by risk groups for prognosis. Risk is based on TNM scores, Gleason score, and PSA values. NCCN experts recommend that these risk groups be used as a foundation to start talking about treatment options.

Nomograms

A nomogram uses data from a large number of men and complex math to predict risk. It can predict one person's risk better than a risk group. A nomogram predicts an event by taking into account similarities and differences among pieces of information. In this book, test and treatment recommendations are sometimes based on nomograms that predict how likely the cancer has spread to lymph nodes. Also, NCCN experts advise that nomograms be used in addition to risk groups to better plan treatment. Websites with information on nomograms are listed in Part 8.

Molecular testing

Any of your body's molecules that can be measured to assess your health is called a biomarker. An example of a biomarker is PSA for detecting prostate cancer. There are also biomarkers for predicting how fast cancer will grow and treatment results. Molecular (or biomarker) testing assesses for such biomarkers.

There are several molecular tests that may help assess how aggressive localized prostate cancer is. Localized cancer includes tumors that have not grown through the prostate and into nearby structures. There is also no spread to nearby lymph nodes or distant sites.

Molecular testing is performed on prostate tissue removed by biopsy or surgery at diagnosis. It can be considered when active surveillance is an option. Molecular tests should be used with standard tests including PSA, Gleason grade, cancer stage, and imaging.

No molecular test of prostate cancer has been assessed in a well-designed research study. Such studies would assign men to research groups by chance. Also, molecular testing would be done first and then outcomes would be assessed over time. Without such studies, there are major limits to how useful molecular tests are for making treatment decisions.

The Decipher test, Prolaris test, and Oncotype DX have been approved by the Molecular Diagnostic Services Program in certain cases. Still, more research is needed. Several other tests are under development.

Imaging for metastases

Imaging tests can help show if the cancer has spread to the lymph nodes or bones. If your life expectancy is more than 5 years or you have cancer symptoms, testing for metastases may help with treatment planning. Signs of metastases are listed in [Guide 1](#). If you have these signs, you may get a 1) bone scan or 2) CT (computed tomography) or MRI scan of your pelvis. Your doctor may change his or her rating of the cancer stage based on these test results.

Most men have minor, if any, problems with imaging tests. There are usually no side effects. Depending on the test, you may need to stop taking some medicines, stop eating and drinking for a few hours, and take off any metal objects from your body. After an imaging test, you will be able to resume your activities right away unless you took a sedative.

You may not learn of the results for a few days since a radiologist or nuclear medicine specialist needs to see the pictures. A radiologist is a doctor who's an expert in reading images. A nuclear medicine specialist is a doctor who's an expert in tests that use radioactive substances.

Guide 1. Deciding factors for imaging tests

Imaging test	Signs of metastases
Get a bone scan if your test results match <u>any</u> the following:	<ul style="list-style-type: none"> • T1 tumor and your PSA levels >20 ng/mL, • T2 tumor and your PSA levels >10 ng/mL, • Gleason score of 8 or higher, • T3 or T4 tumor, or • You have symptoms that suggest cancer is in bone
Get a pelvic CT or MRI if your test results match <u>any</u> the following:	<ul style="list-style-type: none"> • T3 or T4 tumor, or • T1 or T2 tumor and nomogram results show >10% risk of cancer spread to the lymph nodes

Bone scan

A bone scan is advised if you have signs or symptoms of bone metastases. For this test, a radiotracer will be injected into your vein. The most common radiotracer used for bone scans is technetium. A special camera will then take pictures of the dye in the bones. The radiotracer can be seen in your bones 2 to 3 hours after it is injected. You may be asked to drink water and empty your bladder to wash out any of the radiotracer that is not in your bones.

Figure 9 shows a machine that is used to take the pictures. You will need to lie still on the padded table for 45 to 60 minutes to complete the pictures. Prostate cancer in bone can damage the bone causing the bone to try in vain to repair itself.

Areas of bone repair take up more of the radiotracer than healthy bone and thus show up as bright or “hot” spots in the pictures. However, other health conditions besides cancer can cause bone repair. A radiologist can often tell what is and is not cancer in an abnormal bone scan.

CT or MRI

CT or MRI of your pelvis may show if your lymph nodes are enlarged. MRI was described in Part 2. MRI images are made with a magnetic field and radio waves. A CT scan takes many pictures of a body part from different angles using x-rays. A computer combines all the x-rays to make detailed pictures.

Getting a CT scan is like getting an MRI scan. Before CT, you may need to drink enough liquid to have a full

Figure 9. Bone scan machine

Doctors use bone scans to assess if cancer has spread to the bones.



Gamma Camera by Brendaicm available at commons.wikimedia.org/wiki/File:Gamma_camera.jpg under a Creative Commons Attribution-Share Alike 3.0 Unported.

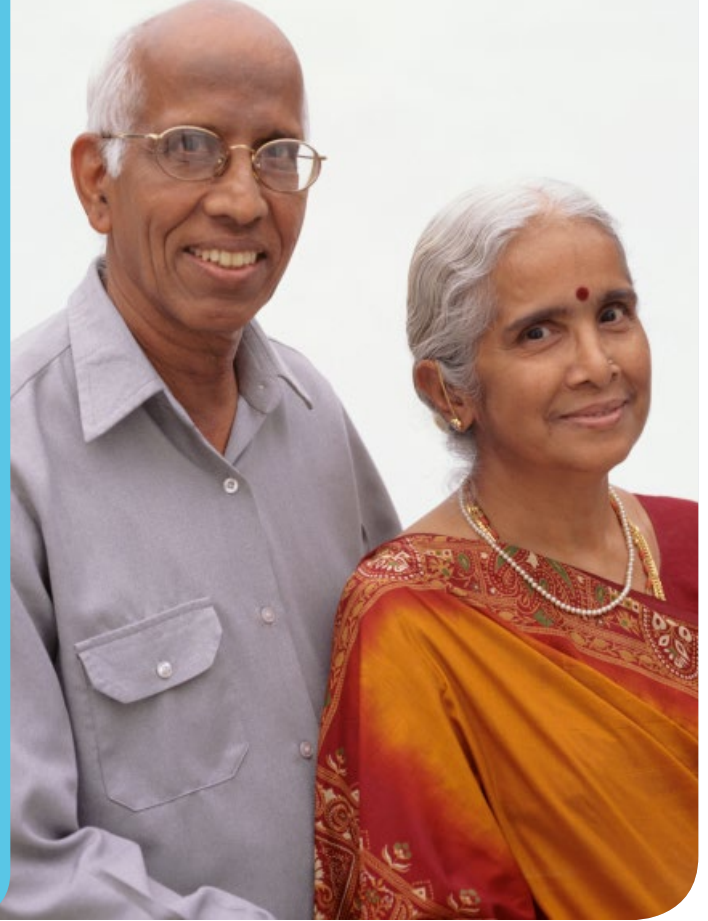


Overview of cancer treatments



4 Overview of cancer treatments

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Part 4 briefly describes the main treatment types for prostate cancer. Knowing what a treatment is will help you understand your treatment options listed in Parts 5 through 7. Not every man with prostate cancer will receive every treatment listed. Before any treatment, talk with your doctor about sperm-banking if you plan to have children.

Active surveillance

Small prostate tumors often have been found with [PSA](#) screening tests. They are also found in prostates removed because of benign prostatic hyperplasia. If small tumors grow slowly, they may not ever cause health problems, especially if you're older. Thus, some men would suffer needlessly from treatment [side effects](#) if all men with prostate cancer were treated. Another option is [active surveillance](#). Active surveillance involves ongoing testing until treatment to try to cure the cancer is needed. More information about this option can be found in Part 5.

Surgical treatment

Surgical treatment may be an option if you are healthy enough to have an operation. The goal of an operation is to remove all the cancer from your body. To do so, the tumor will be removed along with some normal-looking tissue around its rim. The normal-looking tissue is called the surgical margin. Other tissue may be removed along with your prostate as described next.

Radical prostatectomy

A radical prostatectomy is an operation that removes the entire prostate, seminal vesicles, and sometimes other tissue. It is often used when the tumor appears not to have grown outside the prostate—T1 and T2 tumors. Less often, it is used when the tumor has grown outside the prostate but not into other organs. There are four main types of radical prostatectomy. These types are described in this section.

Results of a prostatectomy may be related to the experience of the surgeon. Surgeons who are experienced have better results. When choosing your surgeon, ask how many of these operations he or she has done. Going to a surgeon who has and continues to do many radical prostatectomies may result in a better outcome. Talk to other men with prostate cancer about their experiences.

There are a few steps to prepare for an operation. You may need to stop taking some medications to reduce the risk of severe bleeding. Eating less, changing to a liquid diet, or using enemas or laxatives will empty your bowel. Right before the operation, you will be given anesthesia. Anesthesia may be general, spinal, or epidural.

After a radical prostatectomy, a catheter will be inserted into your urethra to allow your urethra to heal. It will stay in place for 1 to 2 weeks. You will be shown how to use it while you're at home. If removed too early, you may lose control of your bladder (urinary incontinence) or be unable to urinate due to scar tissue.

Open radical prostatectomy

Open radical prostatectomy removes the prostate through one large cut. Your surgeon can make the cut in one of two places.

Radical retropubic prostatectomy. This surgery removes tissue through a cut that runs from your belly button down to the base of your penis. During the operation, you will lie on your back on a table with your legs slightly higher than your head.

Before removing your prostate, some veins and your urethra will be cut to clear the area. Your seminal vesicles will be removed along with your prostate. After removing your prostate, your urethra will be reattached to your bladder.

Your cavernous nerve bundles are on both sides of your prostate. They are needed for natural erections. A nerve-sparing prostatectomy will be done if your cavernous nerves are likely to be cancer-free. However, if the cancer involves them, one or both bundles of nerves will be removed. If removed, good erections are still possible with aids, and orgasms can occur with or without these nerves.

It takes between 90 minutes and 3 hours to complete this operation. You may stay 1 to 2 days in the hospital. It takes about 2 weeks to feel very well, and 4 to 6 weeks to resume all normal activities.

Radical perineal prostatectomy. This surgery removes tissue through a cut in your perineum. The perineum is the area between your scrotum and anus as shown in **Figure 10**. During the operation, you will lie on your back with your legs spread open and supported with stirrups.

Your prostate and seminal vesicles will be removed after being separated from nearby tissues. Nerve sparing is possible but more difficult. Lymph nodes can't be removed. After your prostate has been removed, your urethra will be re-attached to your bladder.

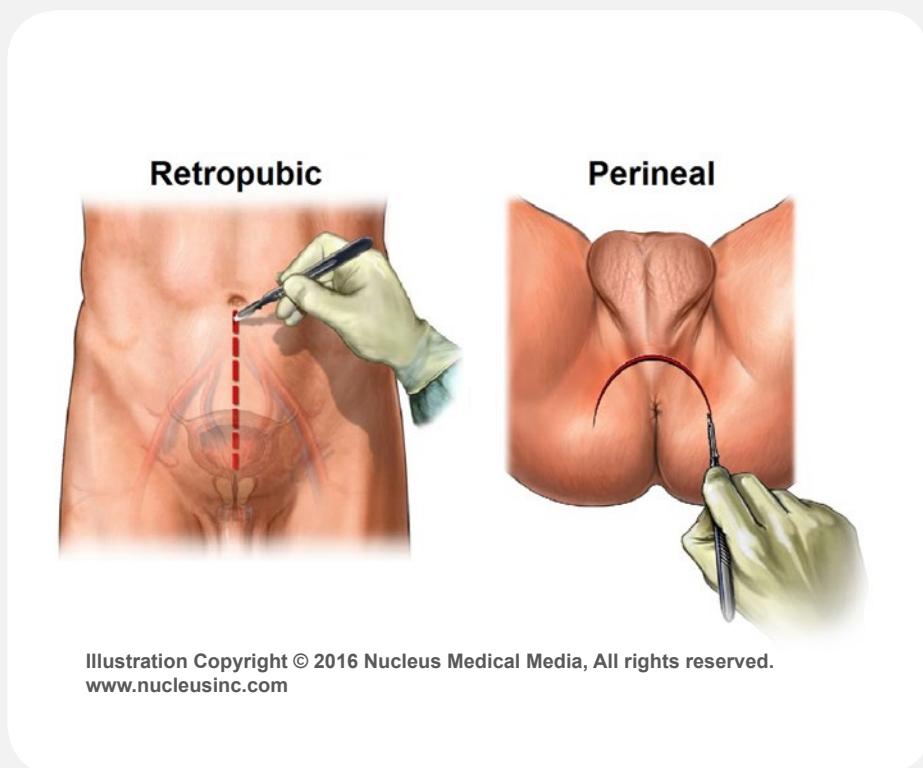
This operation is completed in 1 to 3 hours. You may need to stay 1 to 2 days in the hospital. It takes about 2 weeks to feel very well, and 4 to 6 weeks to resume all normal activities.

Laparoscopic radical prostatectomy

A newer method for removing the prostate is the laparoscopic radical prostatectomy. This operation requires five small cuts, called ports, be made in your pelvis. Tools will be inserted into these cuts to see and remove tissue. It takes between 90 minutes and 4 hours to complete this operation. You will likely leave the hospital the next day. It may take another 2 weeks at home to recover.

Figure 10. Open methods to radical prostatectomy

Your prostate may be removed through one large cut in your pelvis or between your legs.

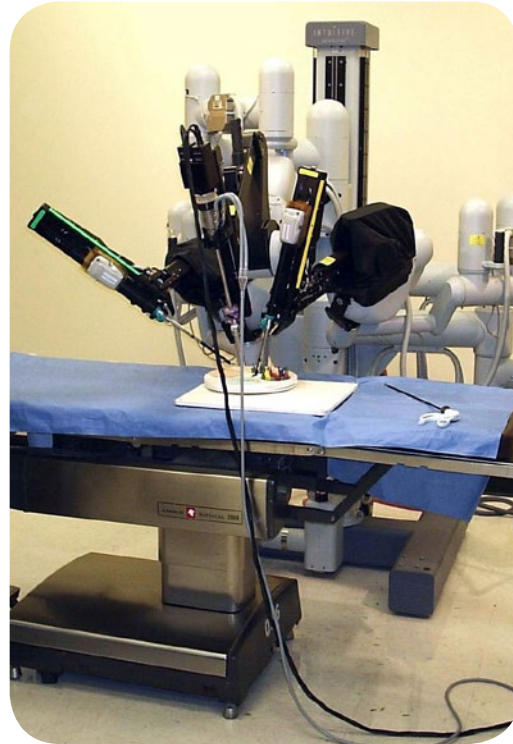


Robotic-assisted radical prostatectomy

A laparoscopic radical prostatectomy can be done with the help of a “robot.” During this surgery, the surgeon will be in the room with you but not by your side. Instead, he or she will be at a desk that is equipped with a computer system. This system allows the surgeon to move robotic arms that hold the surgical tools used to perform the operation. See **Figure 11**. Robotic arms make more precise cuts compared to a surgeon’s hand. However, surgeons can detect changes in the tissue by touching your organs during an open prostatectomy. These changes aren’t detected when a robot is used.

Figure 11. Robotic-assisted radical prostatectomy

Your prostate may be removed by your surgeon with “robotic” arms that hold surgical tools. Your surgeon moves the robotic arms through a computer system instead of with his or her hands. The surgical tools will be inserted into your body through small cuts made into your abdomen.



Laparoscopic Surgery Robot by Nimur available at commons.
[wikimedia.org/wiki/File:Laparoscopic_Surgery_Robot.jpg](https://commons.wikimedia.org/wiki/File:Laparoscopic_Surgery_Robot.jpg) under
 a Creative Commons Attribution-Share Alike 3.0 Unported



Pelvic lymph node dissection

A **PLND** (**pelvic lymph node dissection**) is an operation that removes **lymph nodes** from your pelvis. As described in Part 5, PLND is advised if 1) you have a T1 or T2 tumor, 2) you choose to have a prostatectomy, and 3) a **nomogram** predicts you have a 2% or greater risk for cancer in your lymph nodes. Using a 2% cutoff, nearly half of men (48 out of every 100) will be spared having a PLND. **See Figure 12.** Also, almost all men in this group who have cancer in their lymph nodes will be correctly staged and treated.

An extended PLND removes more lymph nodes than a limited PLND. It finds **metastases** about two times as often as a limited PLND. It also stages cancer more completely and may cure some men with very tiny metastases that haven't spread far. Therefore, an extended PLND is advised if you're to have a PLND. It can be done with an open retropubic, laparoscopic, or robotic method.

Side effects of surgical treatment

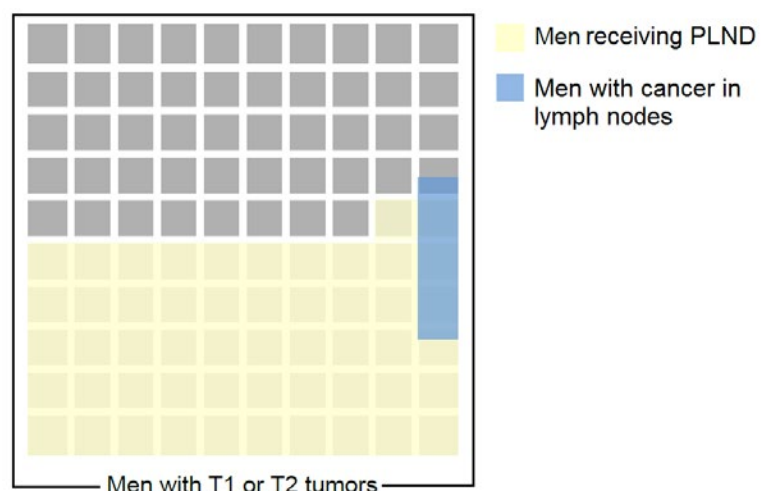
Side effects are unhealthy or unpleasant physical or emotional responses to treatment. You may experience side effects from the general anesthesia, prostatectomy, or the PLND. During the operation, you may have a serious loss of blood and require a blood transfusion. Serious risks of anesthesia and prostatectomy include heart attack and blood clots.

After the operation, general anesthesia may cause a sore throat from a breathing tube, nausea with vomiting, confusion, muscle aches, and itching. From the operation, you will have pain and swelling that often fade away within weeks. The PLND may rarely cause swelling in the legs due to the buildup of **lymph** (lymphedema) that will resolve over several weeks.

Almost every man has **urinary incontinence** and **erectile dysfunction** after a radical prostatectomy. These two side effects may be short lived, but for

Figure 12.
Nomogram results for PLND

Primary tumors that are rated T1 or T2 have not grown outside of the prostate. However, the cancer may have spread to nearby lymph nodes. To receive the best treatment, your doctor needs to know if cancer is present in lymph nodes. When using a $\geq 2\%$ risk cutoff, most men with cancer in their lymph nodes will be correctly staged because they received a PLND.



Radiation therapy

Radiation therapy is a cancer treatment that uses high-energy rays. The rays damage DNA. This either kills the cancer cells or stops new cancer cells from being made. Radiation can also harm normal cells.

Radiation therapy is an option for many men with prostate cancer. Radiation therapy may be given to your pelvic lymph nodes as well as to your prostate. The two ways to give radiation are discussed next.

External beam radiation therapy

Most often, EBRT (external beam radiation therapy) is the method used to treat prostate cancer. This method delivers radiation from outside your body using a large machine. The radiation passes through your skin and other tissue to reach the tumor.

Simulation

Treatment planning with a simulation session is needed. During simulation, pictures of the tumor will be taken with an imaging scan. Pictures are taken after your body is moved into the position needed for treatment.

Using the scans, your treatment team will plan the best radiation dose, number and shape of radiation beams, and number of treatment sessions. Beams are shaped with computer software and hardware added to the radiation machine. Radiation beams are aimed at the tumor with help from ink marks on the skin or marker seeds in the tumor.

Receiving treatment

During treatment, you will lie on a table in the same position as done for simulation. Devices may be used to keep you from moving so that the radiation targets the tumor. You will be alone while the technician operates the machine from a nearby room. He or she will be able to see, hear, and speak with you at all times.

As treatment is given, you may hear noises. One session often takes less than 10 minutes. EBRT is given 5 days a week for about 8 to 9 weeks, although there is growing interest in shortening the length of treatment.

Often, ADT (androgen deprivation therapy) is used with EBRT. ADT is described later in this chapter. Many studies have shown that adding ADT to EBRT improves treatment outcomes when prostate cancers are more aggressive. ADT has side effects so it shouldn't be used unless needed. Some men require short-term (4 to 6 months) ADT. Other men are on ADT for 24 to 36 months.

Radiation techniques

There are multiple types of EBRT. For prostate cancer, 3D-CRT (three-dimensional conformal radiation therapy) or IMRT (intensity-modulated radiation therapy) may be used. In 3D-CRT, the radiation beams match the shape of your tumor to avoid healthy tissues. IMRT is a more precise type of 3D-CRT that may be used especially for more aggressive prostate cancer. The radiation beam is divided into smaller beams, and the strength of each beam can vary.

The prostate can slightly shift within the body. Tumors may also change shape and size between and during treatment visits. IGRT (image-guided radiation therapy) can improve how well 3D-CRT and IMRT target the tumor.

IGRT uses a machine that delivers radiation and also takes pictures of the tumor. Pictures can be taken right before or during treatment. These pictures are compared to the ones taken during simulation. If needed, changes will be made to your body position or the radiation beams.

There are different types of radiation beams. 3D-CRT and IMRT are x-ray-based treatments. They use

photon radiation beams. Photon beams are a stream of particles that have no mass or electric charge.

In recent years, some cancer centers have built radiation machines that use proton beams. Proton beams are a stream of positively charged particles that emit energy within a short distance. Some doctors think that proton treatment is better than x-ray–based treatment. One benefit would be less severe side effects.

To date, research hasn't shown that proton treatment is any better or worse for treating cancer or causing side effects. Well-designed research on IMRT and proton treatment is ongoing. Thus, NCCN experts advise that proton treatment can be an option if received at cancer centers with the proper equipment and experience.

SBRT (stereotactic body radiotherapy) is a newer technique. It treats cancer with very precise, high-dose beams. Receiving SBRT is much like getting other EBRTs except treatment is finished in about 5 visits.

Research thus far has shown that SBRT and IMRT are alike in treating cancer and causing side effects. However, well-designed research of SBRT to assess long-term results is needed. Thus, NCCN experts



advise that treatment with SBRT be carefully decided. If chosen, it should be received only at cancer centers with the proper equipment and experience.

Brachytherapy

Brachytherapy is another standard radiation therapy for prostate cancer. This treatment involves placing radioactive seeds inside your prostate. Brachytherapy is also called interstitial radiation—a seed treatment. Brachytherapy may be used alone or combined with EBRT, ADT, or both.

The seeds are about the size of a grain of rice. They are inserted into your body through the perineum and guided into your prostate with imaging tests. Treatment planning is done beforehand to design the best course of treatment. You will be under general or spinal anesthesia when the seeds are placed. Brachytherapy can be given either as permanent LDR (low-dose rate) or temporary HDR (high-dose rate) brachytherapy.

LDR brachytherapy uses thin needles to place 40 to 100 seeds into your prostate. Placement of the seeds is done as an outpatient procedure. The seeds usually consist of either radioactive iodine or palladium. They will remain in your prostate to give low doses of radiation for weeks or months. The radiation travels a very short distance. This allows for a large amount of radiation within a small area while sparing nearby healthy tissue. Over time, the seeds will stop radiating.

For LDR brachytherapy, seed placement is harder if you have a very large or small prostate, your urine flow is blocked, or you've had TURP (transurethral resection of the prostate). Moreover, your chances of side effects are higher. If your prostate is large, you may be given ADT before LDR brachytherapy to shrink it. After the seeds are implanted, your doctor should measure the radiation dose for quality assurance.

HDR brachytherapy uses seeds made of iridium-194 that are contained inside soft catheters. The catheters are removed after radiation has been given. This treatment requires staying in the hospital for 1 to 2 days. HDR brachytherapy may be given along with EBRT.

Side effects of radiation therapy

Similar to surgical treatment, a common side effect of EBRT and brachytherapy is erectile dysfunction. Unlike surgery, erectile dysfunction may develop several years after radiation therapy. Although not as common as erectile dysfunction, other sexual changes may include difficulty achieving orgasm, thicker semen, dry orgasm, discolored semen, and a decreased sperm count. These less common side effects often stop after a short period of time.

You may develop urinary problems. Urinary problems right after EBRT may include frequent urination, a burning feeling while urinating, blood in urine (hematuria), and feeling the need to rush to a bathroom or you'll leak urine (urge incontinence). After brachytherapy, you may have burning with urination, a slow or weak urinary stream, urinary retention, overflow incontinence, and hematuria. These side effects go away. Several years later, radiation injury to the bladder can cause urinary incontinence, although this isn't common for either EBRT or brachytherapy. However, your risk after brachytherapy is higher if you have had a TURP.

Despite the best treatment planning and delivery, your rectum will be exposed to some radiation during EBRT or brachytherapy. You may have rectal pain, diarrhea, blood in the stool, and inflammation of the colon. These side effects will go away over several months. Several years later, radiation injury to the rectum can cause rectal bleeding and irritation but these symptoms are rare.

EBRT may cause changes in your skin. Your treated skin will look and feel as if it has been sunburned. It will likely become red and may also become dry and sore and feel painful when touched. You may also feel extremely tired despite sleep (fatigue) and not feel hungry. Exercise may help reduce fatigue.

Not all side effects of radiation therapy are listed here. Please ask your treatment team for a complete list of common and rare side effects. If a side effect bothers you, tell your treatment team. There may be ways to help you feel better.

Cryosurgery

Cryosurgery is a treatment option if radiation therapy fails. Cryosurgery treats prostate tumors by freezing them. This treatment is often done as an outpatient procedure.

Very thin needles will be inserted through your perineum into your prostate. Imaging tests will be used to place the needles. Argon gas will flow through the needles and freeze your prostate to below-zero temperatures. Freezing kills the cancer cells. Your urethra will be spared by use of a catheter filled with warm liquid.

The full range of side effects from cryotherapy is unknown. More research is needed. Known short-term side effects include urinary retention, painful swelling, and "pins and needles" feeling in the penis (penile paresthesia). Long-term side effects include erectile dysfunction, stress incontinence, fistulas, and blockage of the urethra with rectal scar tissue.

Hormone therapy

Prostate cancer cells need hormones called androgens to grow. The main male androgen is testosterone. Hormone therapy will stop your body from making testosterone or will stop the action of testosterone. It can slow tumor growth or shrink the tumor for a period of time.

The types of hormone therapy are:

- Bilateral orchiectomy is the surgical removal of both testicles. They are removed since they make most of the testosterone in the body.
- LHRH (luteinizing hormone-releasing hormone) agonists are drugs used to stop the testicles from making testosterone. They are either injected into a muscle or implanted under the skin every 1, 3, 4, 6, or 12 months. LHRH agonists include goserelin acetate, histrelin acetate, leuprolide acetate, and triptorelin palmoate.
- LHRH antagonists are drugs used to stop the testicles from making testosterone. They are injected under the skin usually every month. Degarelix is an LHRH antagonist.
- Antiandrogens are drugs that block receptors on cancer cells from receiving testosterone. Antiandrogens include bicalutamide, flutamide, nilutamide, and enzalutamide.
- Estrogens can stop the adrenal glands and other tissues from making testosterone.
- Corticosteroids can stop the adrenal glands and other tissues from making testosterone. Hydrocortisone is a corticosteroid.
- Androgen synthesis inhibitors are drugs that block the making of androgen at different sites. Ketoconazole is an antifungal drug that stops the adrenal glands and other tissues from making testosterone. Abiraterone acetate works similarly but is more potent and less toxic.

The term “hormone therapy” can be confusing because of the many names it is called. Some people refer to all hormone therapy as androgen suppression therapy or ADT. However, to be exact, only orchiectomy and LHRH agonists and antagonists are ADTs.

Sometimes, antiandrogens are used with LHRH agonists or following an orchiectomy. This type of treatment is called CAB (combined androgen blockade). However, CAB is no better than castration alone for metastases. Moreover, it may lead to higher costs and worse side effects.

Finasteride or dutasteride used with CAB is called triple androgen blockade. The benefit of triple androgen blockade is probably small if any benefit exists. If you will be on long-term ADT, your doctor may consider intermittent treatment to reduce side effects. Intermittent treatment is alternating periods of time on and off treatment. It can provide similar cancer control to continuous hormone therapy.

Side effects of hormone therapy

Hormone therapy has multiple side effects. It can be hard to know whether you will get a side effect. Many factors play a role. Such factors include your age, your health before treatment, how long or often you take treatment, and so forth.

Side effects differ between the types of hormone therapy. In general, ADT may reduce your desire for sex and cause erectile dysfunction. These sexual side effects don't seem to lessen with time. The longer you take ADT, the more your risk for thinning and weakening bones (osteoporosis), bone fractures, weight gain, loss of muscle mass, diabetes, and heart disease increases. Other side effects of ADT include hot flashes, mood changes, and fatigue.

A side effect specific to orchiectomy is the loss of your testicles. Implants that look like testicles can

be inserted into your scrotum. Your testicles won't be removed with LHRH agonists but these drugs will shrink your testicles over time.

Side effects of antiandrogens are like those of ADT. When an antiandrogen is used with an LHRH agonist, diarrhea is a major side effect. Other side effects include nausea, liver problems, breast growth and tenderness, and tiredness. Estrogens also increase risk for breast growth and tenderness as well as blood clots. Ketoconazole can cause low cortisol levels and cause health problems when taken with other drugs.

Abiraterone with prednisone is a newer hormone therapy. While taking abiraterone, you should be tested for high blood pressure (hypertension), low potassium (hypokalemia), fluid buildup (edema), and problems with your adrenal glands, heart, and liver. You could also have hot flashes, fatigue, diarrhea, vomiting, constipation, coughing, shortness of breath, joint or muscle pain, and lung or urinary infections.

Enzalutamide is also a newer hormone therapy. A rare but severe side effect of enzalutamide is seizures. Common side effects include fatigue, hot flashes, diarrhea, headaches, pain, not feeling hungry, constipation, lung infections, swelling, shortness of breath, weight loss, headache, high blood pressure, dizziness, and a feeling that things are spinning around (vertigo). The chance that you may fall is greater when taking enzalutamide.

Not all of the side effects of hormone therapy are listed here. Please ask your treatment team for a complete list of common and rare side effects. If a side effect bothers you, tell your treatment team. There may be ways to help you feel better. Some ways to reduce risks of hormone therapy are discussed in Part 6, but your treatment team can tell you more.

Immunotherapy

Sipuleucel-T is a drug that uses your white blood cells to destroy prostate cancer cells. In a lab, your white blood cells from a blood sample will be changed by a protein so they will find and destroy prostate cancer cells. Common side effects of this drug include chills, fever, nausea, and headache. These effects don't appear to last for long. Serious heart problems rarely occur.

Chemotherapy

Chemotherapy, or "chemo," is the use of drugs to kill cancer cells. Some chemotherapy drugs kill cancer cells by damaging their DNA or disrupting the making of DNA. Other drugs interfere with cell parts that are needed for making new cells.

Docetaxel and cabazitaxel are chemotherapy drugs used to treat advanced prostate cancer. They may improve survival, delay or relieve symptoms, and reduce tumor growth and PSA levels. Mitoxantrone hydrochloride may relieve symptoms caused by advanced cancer. Read Part 7 for more details on chemotherapy.

See [Guide 2](#) for a list of drugs used to treat prostate cancer. The chemotherapy drugs used to treat prostate cancer are liquids that are injected into a vein. The drugs travel in the bloodstream to treat cancer throughout the body. Chemotherapy is given in cycles of treatment days followed by days of rest. This allows the body to recover before the next cycle.

Docetaxel is an option for some men who are taking ADT for the first time. In this case, six 3-week cycles are advised. Side effects may include fatigue, weakness or numbness in the toes or fingers (neuropathy), inflammation of the mouth (stomatitis),

Guide 2. Drug treatment for prostate cancer

Generic name	Brand name (sold as)	Type of treatment
Abiraterone acetate	Zytiga™	Hormone therapy
Bicalutamide	Casodex®	Hormone therapy
Cabazitaxel	Jevtana®	Chemotherapy
Degarelix	Firmagon®	Hormone therapy
Diethylstilbestrol (DES)	–	Hormone therapy
Docetaxel	Taxotere®	Chemotherapy
Enzalutamide	Xtandi®	Hormone therapy
Flutamide	–	Hormone therapy
Goserelin acetate	Zoladex®	Hormone therapy
Histrelin acetate	Vantas®	Hormone therapy
Hydrocortisone	Cortef®	Hormone therapy
Ketoconazole	Nizoral®	Hormone therapy
Leuprolide acetate	Eligard®, Lupron Depot®, Lupron®	Hormone therapy
Mitoxantrone hydrochloride	Novantrone®	Chemotherapy
Nilutamide	Nilandron	Hormone therapy
Prednisone	–	Hormone therapy
Radium-223	Xofigo	Radiopharmaceutical
Sipuleucel-T	Provenge®	Immunotherapy
Triptorelin pamoate	Trelstar®	Hormone therapy

diarrhea, and low counts of neutrophils (neutropenia) with or without fever. Neutrophils are a type of white blood cell.

Docetaxel is also used to treat metastases after ADT fails to stop cancer growth. Three-week cycles are also advised. The number of cycles you receive should be based on how much the drug is helping and the severity of side effects.

Cabazitaxel is an option if docetaxel fails to work. However, the benefits of cabazitaxel are small and the side effects can be severe. You should not take cabazitaxel if your liver, kidney, or bone marrow is not working well or if you have severe neuropathy.

You may have a severe allergic reaction within a few minutes of receiving cabazitaxel. Common side effects are fatigue, neuropathy, hematuria, back pain, bruising, shortness of breath, cough, joint pain, and hair loss. Severe stomach and intestinal problems, illness from too few white blood cells, and kidney failure may occur.

Not all of the side effects of chemotherapy are listed here. Please ask your treatment team for a complete list of common and rare side effects. If a side effect bothers you, tell your treatment team. There may be ways to help you feel better.

Radiopharmaceuticals

Radiopharmaceuticals are drugs that contain a radioactive substance. Radium-223 is a radiopharmaceutical that is injected into the body to treat prostate cancer that has spread to the bone. It may improve survival time. It may also delay bone problems and the need for radiation to treat pain.

Since the chemical makeup of radium-223 is similar to calcium, it travels to bone damaged by cancer. Once it reaches the bone, it delivers radiation that kills the nearby cancer cells. The radiation doesn't travel far so healthy tissue is spared.

Radium-223 may lower blood cells counts. Thus, you may get infections and bruises and have unusual bleeding or fatigue. Since radium-223 leaves the body through the gut, other common side effects are nausea, diarrhea, and vomiting.

⁸⁹Sr (strontium-89) and ¹⁵³Sm (Samarium-153) also are radiopharmaceuticals. They haven't been shown to extend life. However, they may relieve pain caused by cancer metastases in the bone. They also may cause a decrease in the number of blood cells.

Clinical trials

New tests and treatments aren't offered to the public as soon as they're made. They need to be studied. A clinical trial is a type of research that studies a test or treatment.

Clinical trials study how safe and helpful tests and treatments are. When found to be safe and helpful, they may become tomorrow's standard of care. Because of clinical trials, the tests and treatments in this book are now widely used to help men with prostate cancer. Future tests and treatments that may have better results than today's treatments will depend on clinical trials.

New tests and treatments go through a series of clinical trials to make sure they're safe and work. Without clinical trials, there is no way to know if a test or treatment is safe or helpful. Clinical trials have four phases. Examples of the four phases for treatment are:

- **Phase I** trials aim to find the best dose of a new drug with the fewest side effects.
- **Phase II** trials assess if a drug works for a specific type of cancer.
- **Phase III** trials compare a new drug to the standard treatment.
- **Phase IV** trials test new drugs approved by the U.S. FDA (**F**ood and **D**rug **A**dministration) in many patients with different types of cancer.

Joining a clinical trial has benefits. First, you'll have access to the most current cancer care. Second, you will receive the best management of care. Third, the results of your treatment—both good and bad—will be carefully tracked. Fourth, you may help other people who will have cancer in the future.

Clinical trials have risks, too. Like any test or treatment, there may be side effects. Also, new tests

or treatments may not help. Another downside may be that paperwork or more trips to the hospital are needed.

To join a clinical trial, you must meet the conditions of the study. Patients in a clinical trial are often alike in terms of their cancer and general health. This is to know that any progress is because of the treatment and not because of differences between patients.

To join, you'll need to review and sign a paper called an informed consent form. This form describes the study in detail. The study's risks and benefits should be described and may include others than those described above.

Ask your treatment team if there is an open clinical trial that you can join. There may be clinical trials where you're getting treatment or at other treatment centers nearby. You can also find clinical trials through the websites listed in Part 8.

Understudied treatments

The treatments described so far are those approved by NCCN experts. These treatments have been proven in clinical trials to be safe and work well. You may have heard about other treatments. Some treatments that are of great interest but need more research are addressed next.

Cryosurgery as initial treatment

Cryosurgery is a treatment option following failure of radiation therapy. It is not recommended as an initial treatment at this time. More research is needed to compare cryosurgery to prostatectomy and radiation therapy.

High-intensity focused ultrasound

HIFU (high-intensity focused ultrasound) is a treatment that is gaining interest. This treatment kills cancer using a machine that emits strong sound waves. It only treats a confined area of cancer. HIFU isn't recommended by NCCN experts at this time unless it's part of a clinical trial.

Vascular-targeted photodynamic

VTP (vascular-targeted photodynamic) destroys blood vessels of prostate tumors. It consists of a drug that is first injected into your vein. Then, the drug is activated by light. The light is emitted from tiny laser fibers that are inserted into your prostate. VTP isn't recommended by NCCN experts at this time unless it's part of a clinical trial.

Complementary and alternative medicine

CAM (complementary and alternative medicine) is a group of treatments that aren't often given by doctors. There is much interest today in CAM for cancer.

Many CAMs are being studied to see if they are truly helpful.

Complementary medicines are treatments given along with usual medical treatments. While CAMs aren't known to kill cancer cells, they may improve your comfort and well-being. Two examples are acupuncture for pain management and yoga for relaxation.

Alternative medicine is used in place of usual medicine. Some alternative medicines are sold as cures even though they haven't been proven to work. If there was good proof that CAMs or other treatments cured cancer, they would be included in this book.

It is important to tell your treatment team if you are using any CAMs. They can tell you which CAMs may be helpful and which CAMs may limit how well medical treatments work.

Review

- A radical prostatectomy removes the prostate and the seminal vesicles.
- A PLND removes lymph nodes near the prostate.
- Radiation from a machine or "seeds" is used to kill cancer cells or stop new cancer cells from being made.
- Cryosurgery kills cancer cells by freezing them.
- Hormone therapy treats prostate cancer by either stopping testosterone from being made or stopping the action of testosterone.
- Immunotherapy activates your body's disease-fighting system to destroy prostate cancer cells.
- Chemotherapy stops cancer cells from completing their life cycle so they can't increase in number.
- Radiopharmaceuticals are radioactive drugs used to treat cancer in the bones.
- Clinical trials give people access to new tests and treatments that otherwise can't usually be received. These new tests and treatments may, in time, be approved by the FDA.
- More research on cryosurgery, HIFU, VTP, and CAM is needed.

Treatment guide: Initial treatment



5 Treatment Guide: Initial treatment

48 Very low risk

This section lists treatment options for men who meet five conditions: 1) cancer stage T1c, N0, M0; 2) PSA level less than 10 ng/mL; 3) PSA density less than 0.15 ng/mL/g; 4) Gleason score 6 or less; and 5) cancer in fewer than three biopsy cores and in half or less of any core.

50 Low risk

This section lists treatment options for men who meet three conditions: 1) cancer stage T1a, T1b, T1c, or T2a and N0, M0; 2) PSA level less than 10 ng/mL; and 3) Gleason score 6 or less.

54 Intermediate risk

This section lists treatment options for men who meet one of three conditions: 1) cancer stage T2b or T2c and N0, M0, 2) PSA level between 10 and 20 ng/mL, or 3) Gleason score 7. If you meet more than one condition, your doctor may treat the cancer as high risk.

58 High risk

This section lists treatment options for men who meet one of three conditions: 1) cancer stage T3a, N0, M0; 2) PSA level greater than 20 ng/mL; or 3) Gleason score between 8 and 10. If you meet more than one condition, your doctor may treat the cancer as very high risk.

60 Very high risk

This section lists treatment options for men who meet one of three conditions: 1) cancer stage T3b or T4 and N0, M0; 2) primary Gleason grade 5; or 3) more than 4 biopsy cores with Gleason scores between 8 and 10.

62 Regional cancer

This section lists treatment options for cancer staged as Any T, N1, M0.






62 Metastatic cancer

This section lists treatment options for cancer staged as M1.

64 Review

Very low risk

Guide 3. Primary treatment

Expected years to live		What are the options?
<10 years		<ul style="list-style-type: none"> • Observation
10–20 years		<ul style="list-style-type: none"> • Active surveillance <ul style="list-style-type: none"> ◦ PSA no more often than every 6 months, ◦ DRE no more often than every 12 months, and ◦ Prostate biopsy no more often than every 12 months ◦ Consider mpMRI to help stage and grade the cancer if PSA increases and biopsy samples had no cancer
≥20 years		<ul style="list-style-type: none"> • Active surveillance <ul style="list-style-type: none"> ◦ PSA no more often than every 6 months, ◦ DRE no more often than every 12 months, and ◦ Prostate biopsy no more often than every 12 months ◦ Consider mpMRI to help stage and grade the cancer if PSA increases and biopsy samples had no cancer
		<ul style="list-style-type: none"> • Radiation therapy <ul style="list-style-type: none"> ◦ EBRT ◦ LDR brachytherapy
		<ul style="list-style-type: none"> • Surgical treatment <ul style="list-style-type: none"> ◦ Radical prostatectomy ◦ Radical prostatectomy + PLND if ≥2% risk of cancer in lymph nodes

Guide 3 lists the treatment options for men at very low risk of recurrence. The criteria for very low risk include a T1c tumor. This tumor can't be felt with a DRE but is found because of high PSA levels. NCCN experts are concerned about over-treatment of this early cancer.

Observation

NCCN experts advise starting observation if you're expected to live less than 10 years. The cancer may never cause any problems. Observation consists of testing on a regular basis so that supportive care with ADT can be given if symptoms from the cancer are likely to start. Tests during observation include PSA and DRE.

Active surveillance

Active surveillance is advised if you are likely to live more than 10 years. Active surveillance consists of testing on a regular basis so that treatment can be started when needed. Treatment is given when there is still an excellent chance for a cure.

Active surveillance consists of multiple tests. In general, PSA testing should occur no more often than every 6 months. DRE should occur no more often than every 12 months.

Doctors don't agree on the need for and frequency of repeat biopsies. Some doctors do repeat biopsies each year and others do them based on test results. Examples of such test results include a rise in PSA level or change in DRE.

A decision to do a repeat biopsy should balance the potential benefits and risks. Risks include infection and other side effects. If 10 or more cores were removed, the next biopsy may be done within 18 to 24 months of diagnosis. If you're likely to live less than 10 years or are older than 75 years of age, repeat prostate biopsies are rarely needed.

A prostate biopsy may be done under the guidance of MRI images combined with real-time ultrasound images. This type of biopsy is called an MRI-US fusion biopsy. It may help detect higher-grade cancers. Higher-grade cancers include those with Gleason score 7 through 10.

The use of mpMRI may help to assess whether the cancer is still very low risk. Your doctor may suspect that the cancer is in the front part of your prostate that can't be felt during DRE. This is called anterior prostate cancer. Your doctor may also or instead suspect that an aggressive cancer is now present. mpMRI may help stage and grade the cancer when the PSA level increases but no cancer was found in biopsy samples.

MRI may still miss small but aggressive cancers. Thus, biopsies may still be helpful if MRI doesn't detect cancer. Likewise, biopsies done with ultrasound may miss high-grade tumors. MRI may better assist in finding these tumors than a standard prostate biopsy.

There is debate over which events during active surveillance should signal the start of treatment. The decision to start treatment should be based on your doctor's judgment and your personal wishes. NCCN experts suggest the following triggering events:

- Cancer from the repeat biopsy has a Gleason grade of 4 or 5, or
- There is a larger amount of cancer within biopsy samples or a greater number of biopsy samples have cancer.

Radiation therapy





If you will likely live more than 20 years, you may want treatment now instead of active surveillance. In time, the cancer may grow outside your prostate, cause symptoms, or both. In this case, radiation therapy is an option. Very-low-risk cancers can be treated with EBRT to the prostate and maybe the seminal vesicles but not to the pelvic lymph nodes. They can also be treated with LDR brachytherapy alone.

Surgical treatment

Surgical treatment is another option if you will likely live more than 20 years. It should consist of a radical prostatectomy. Your pelvic lymph nodes may also be removed if your risk for them having cancer is 2% or higher. Your doctor will determine your risk using a nomogram, which was described in Part 3.

Low risk

Guide 4. Primary treatment

Expected years to live		What are the options?
<10 years		<ul style="list-style-type: none"> • Observation
>10 years		<ul style="list-style-type: none"> • Active surveillance <ul style="list-style-type: none"> ◦ PSA no more often than every 6 months, ◦ DRE no more often than every 12 months, and ◦ Prostate biopsy no more often than every 12 months ◦ Consider mpMRI to help stage and grade the cancer if PSA increases and biopsy samples had no cancer
		<ul style="list-style-type: none"> • Radiation therapy <ul style="list-style-type: none"> ◦ EBRT ◦ LDR brachytherapy
		<ul style="list-style-type: none"> • Surgical treatment <ul style="list-style-type: none"> ◦ Radical prostatectomy ◦ Radical prostatectomy + PLND if $\geq 2\%$ risk of cancer in lymph nodes

Guide 4 lists the treatment options for men at low risk of recurrence. The criteria for low risk include T1 and T2a tumors. Treatment options are based on how many years a man is expected to live.

Observation

NCCN experts advise starting observation if you're expected to live less than 10 years. The cancer may never cause any problems. Observation consists of testing on a regular basis so that supportive care with ADT can be given if symptoms from the cancer are likely to start. Tests during observation include PSA and DRE.

Active surveillance

Active surveillance is an option if you are likely to live more than 10 years. Active surveillance consists of testing on a regular basis so that treatment can be started when needed. Treatment is given when there is still an excellent chance for a cure.

Active surveillance consists of multiple tests. In general, PSA testing should occur no more often than every 6 months. DRE should occur no more often than every 12 months.

Doctors don't agree on the need for and frequency of repeat biopsies. Some doctors do repeat biopsies

each year and others do them based on test results. Examples of such test results include a rise in PSA level or change in DRE.

A decision to do a repeat biopsy should balance the potential benefits and risks. Risks include infection and other side effects. If 10 or more cores were removed, the next biopsy may be done within 18 to 24 months of diagnosis. If you're likely to live less than 10 years or are older than 75 years of age, repeat prostate biopsies are rarely needed.

A prostate biopsy may be done under the guidance of MRI images combined with real-time ultrasound images. This type of biopsy is called MRI-US fusion biopsy and may help detect higher-grade cancers. Higher-grade cancers include those with Gleason score 7 through 10.

The use of mpMRI may help to assess whether the cancer is still low risk. Your doctor may suspect that the cancer is in the front part of your prostate that can't be felt during DRE. This is called anterior prostate cancer. Your doctor may also or instead suspect that an aggressive cancer is now present. mpMRI may help stage and grade the cancer when the PSA level increases but no cancer was found in biopsy samples.

MRI may still miss small but aggressive cancers. Thus, biopsies may still be helpful if MRI doesn't detect cancer. Likewise, biopsies done with ultrasound may miss high-grade tumors. MRI may better assist in finding these tumors than a standard prostate biopsy.

There is debate over which events during active surveillance should signal the start of treatment. The decision to start treatment should be based on your

doctor's judgment and your personal wishes. NCCN experts suggest the following triggering events:

- Cancer from the repeat biopsy has a Gleason grade of 4 or 5, or
- There is a larger amount of cancer within biopsy samples or a greater number of biopsy samples have cancer.

Radiation therapy

If you will likely live more than 10 years, you may want treatment now instead of active surveillance. In time, the cancer may grow outside your prostate, cause symptoms, or both. In this case, radiation therapy is an option. Low-risk cancers can be treated with EBRT to the prostate and maybe the seminal vesicles but not to the pelvic lymph nodes. They can also be treated with LDR brachytherapy alone.






Surgical treatment

Surgical treatment is another option if you will likely live more than 10 years. It should consist of a radical prostatectomy. Your pelvic lymph nodes may also be removed if your risk for them having cancer is 2% or higher. Your doctor will determine your risk using a nomogram, which was described in Part 3.

The tissue that will be removed from your body during the operation will be sent to a pathologist. He or she will assess how far the cancer has spread within the tissue. After the operation, your PSA level will also be tested.





You may receive more treatment after surgery. Read Guide 5 for more information.

Guide 5. Adjuvant treatment after prostatectomy

Test results		What are the options?
No high-risk features or cancer in lymph nodes		• Observation
High-risk features but no cancer in lymph nodes		• EBRT
		• Observation
Cancer in lymph nodes		• ADT ± EBRT
		• Observation

Intermediate risk

Guide 6. Primary treatment

Expected years to live		What are the options?
<10 years		<ul style="list-style-type: none"> • Observation
		<ul style="list-style-type: none"> • Radiation therapy <ul style="list-style-type: none"> ◦ EBRT ± brachytherapy ± ADT for 4–6 months ◦ LDR brachytherapy alone for low-volume disease
>10 years*		<ul style="list-style-type: none"> • Surgical treatment <ul style="list-style-type: none"> ◦ Radical prostatectomy ◦ Radical prostatectomy + PLND if ≥2% risk of cancer in lymph nodes
		<ul style="list-style-type: none"> • Radiation therapy <ul style="list-style-type: none"> ◦ EBRT ± brachytherapy ± ADT for 4–6 months ◦ LDR brachytherapy alone for low-volume disease

*Men with “favorable” cancer may start active surveillance but more research on outcomes is needed.

Guide 6 lists the treatment options for men in the intermediate risk group. The criteria for intermediate risk include T2b and T2c tumors. Treatment options are based on how many years a man is expected to live.

Observation






Observation is an option for men expected to live less than 10 years. The cancer is unlikely to cause problems. Observation consists of testing on a regular basis so that supportive care with ADT can be given if symptoms from the cancer are likely to start. Tests during observation include PSA and DRE.

Radiation therapy

A treatment option for all men with intermediate risk is radiation therapy. Research has shown that EBRT alone often controls intermediate-risk prostate cancer. LDR or HDR brachytherapy can be used with EBRT for intermediate-risk cancers but will likely cause more side effects. LDR brachytherapy alone may be given if test results suggest the cancer hasn't spread far.

Your doctor may want to add a short course of ADT to EBRT. Research has shown that adding ADT can extend life. For ADT, an LHRH antagonist or LHRH agonist may be used. However, doctors often use CAB, which includes an antiandrogen. If you will receive ADT, it will be given before, during, and after radiation therapy for 4 to 6 months.

Guide 7. Adjuvant treatment after prostatectomy

Test results		What are the options?
No high-risk features or cancer in lymph nodes		• Observation
High-risk features but no cancer in lymph nodes		• EBRT
		• Observation
Cancer in lymph nodes		• ADT ± EBRT
		• Observation

Guide 7 lists options for adjuvant treatment after a prostatectomy. Adjuvant treatment helps to stop the cancer from returning

Options are based on the presence of high-risk features and cancer in the lymph nodes. High-risk features suggest that not all of the cancer was removed by the operation. High-risk features include:

- Cancer in surgical margins,
- Cancer outside the prostatic capsule,
- Cancer in the seminal vesicle(s),
- Detectable PSA levels.

If test results find no high-risk features or cancer in the lymph nodes, no more treatment is needed. You may start observation.

EBRT or observation is an option for when there are high-risk features but no cancer in lymph nodes. EBRT will target areas where the cancer cells have

likely spread. Treatment will be started after you've healed from the prostate operation.

There are two treatment options if cancer is found in lymph nodes. The first option is to start ADT now. EBRT may be given with ADT. If your PSA levels are undetectable, a second option is to start observation. Supportive care with ADT can be started if the levels rise.

For adjuvant ADT, an LHRH antagonist or LHRH agonist is advised. It can be given on an intermittent schedule to reduce its side effects. However, the benefits of ADT in this case are unclear.

High risk

Guide 8. Primary treatment

What are the options?

- EBRT + ADT for 2–3 years
- EBRT+ brachytherapy ± ADT for 2–3 years
- EBRT + ADT for 2–3 years + docetaxel
- Radical prostatectomy + PLND






Guide 9. Adjuvant treatment

After radiation therapy

What are the options?

- If on ADT, continue to complete 2–3 years of ADT

After prostatectomy

Test results		What are the options?
No high-risk features or cancer in lymph nodes		• Observation
High-risk features but no cancer in lymph nodes		• EBRT
		• Observation
Cancer in lymph nodes		• ADT ± EBRT
		• Observation

Guide 8 lists the treatment options for men in the high-risk group. The criteria for high risk include T3a tumors. For high-risk cancers, research supports treatment unless you're likely to live less than 5 years when observation is the best choice.

There are four treatment options for high-risk tumors. The first option is EBRT to the prostate and pelvic lymph nodes and long-term ADT. The second treatment option is EBRT plus HDR brachytherapy and maybe ADT.

A third option is EBRT with long-term ADT and docetaxel. However, the role of docetaxel for high-risk cancer is still being studied. There is more to learn about the benefits and risks. Docetaxel is given after radiation for typically six 3-week cycles.

When used with radiation, ADT may consist of an LHRH antagonist or LHRH agonist. However, doctors often use CAB, which includes an antiandrogen. CAB may increase side effects but may also control the growth of prostate cancer for a longer period of time. If you will receive ADT, it will be given before, during, and after radiation therapy for a total of 2 to 3 years.

A fourth option is a radical prostatectomy with PLND, which removes your pelvic lymph nodes. The tissue that will be removed from your body will be sent to a pathologist. He or she will assess how far the cancer has spread within the tissue. Your PSA level will also be tested.

Guide 9 lists options for adjuvant treatment. Adjuvant treatment helps to stop the cancer from returning.

If you had radiation therapy, you may have started ADT. ADT is recommended for 2 to 3 years, so you will need to keep taking these drugs after radiation therapy has ended.

Options for adjuvant treatment after a prostatectomy are based on the presence of high-risk features and cancer in the lymph nodes. High-risk features suggest that not all of the cancer was removed by the operation. High-risk features include:

- Cancer in surgical margins,
- Cancer outside the prostatic capsule,
- Cancer in the seminal vesicle(s), and
- Detectable PSA levels.

If test results find no high-risk features or cancer in the lymph nodes, no more treatment is needed. You may start observation.

EBRT or observation is an option for when there are high-risk features but no cancer in lymph nodes. EBRT will target areas where the cancer cells have likely spread. Treatment will be started after you've healed from the operation.

There are two treatment options if cancer is found in lymph nodes. The first option is to start ADT now. EBRT may be given with ADT. If your PSA levels are undetectable, a second option is to start observation. Supportive care with ADT can be started if the levels rise.

For adjuvant ADT, an LHRH antagonist or LHRH agonist is advised. It can be given on an intermittent schedule to reduce its side effects. However, the benefits of ADT in this case are unclear.

Very high risk

Guide 10. Primary treatment

What are the options?

- EBRT + ADT for 2–3 years
- EBRT+ brachytherapy ± ADT for 2–3 years
- EBRT + ADT for 2–3 years + docetaxel
- Radical prostatectomy and PLND if the cancer isn't fixed to nearby organs
- ADT when a cure is not possible






Guide 11. Adjuvant treatment

After radiation therapy

What are the options?

- If on ADT, continue to complete 2–3 years of ADT

After prostatectomy

Treatment results		What are the options?
No high-risk features or cancer in lymph nodes		• Observation
High-risk features but no cancer in lymph nodes		• EBRT
		• Observation
Cancer in lymph nodes		• ADT ± EBRT
		• Observation

Guide 10 lists the treatment options for men in the very-high-risk group. Men at very high risk include those with T3b and T4 tumors, primary Gleason grade 5, or more than 4 biopsy cores with Gleason scores between 8 and 10. There are five treatment options for very-high-risk tumors.

The first option is EBRT to the prostate and pelvic lymph nodes and long-term ADT. The second treatment option is EBRT plus HDR brachytherapy and maybe ADT.

A third option is EBRT with long-term ADT and docetaxel. However, the role of docetaxel for very-high-risk cancer is still being studied. There is more to learn about the benefits and risks. Docetaxel is given after radiation for typically six 3-week cycles.

When used with radiation, ADT may consist of an LHRH antagonist or LHRH agonist. However, doctors often use CAB, which includes an antiandrogen. CAB may increase side effects but may also control the growth of prostate cancer for a longer period of time. If you will receive ADT, it will be given before, during, and after radiation therapy for a total of 2 to 3 years.

If the tumor isn't fixed to nearby organs, a fourth option is a radical prostatectomy with PLND. When a tumor isn't fixed, it is more likely to be fully removed. In this case, an operation may be able to cure the cancer.

The tissue that will be removed from your body will be sent to a pathologist. He or she will assess how far the cancer has spread within the tissue. Your PSA level will also be tested.

The fifth option is ADT for very-high-risk cancer that can't be cured. The goal of ADT is to control the growth of the cancer. In this case, ADT includes an LHRH antagonist or LHRH agonist. If these drugs

don't suppress your testosterone level, your doctor may want you to take CAB.

Guide 11 lists options for adjuvant treatment. If you had radiation therapy, you may have started ADT. ADT is recommended for 2 to 3 years, so you will need to keep taking these drugs after radiation therapy has ended.

Options for adjuvant treatment after a prostatectomy are based on the presence of high-risk features and cancer in the lymph nodes. High-risk features suggest that not all of the cancer was removed by the operation. High-risk features include:

- Cancer in surgical margins,
- Cancer outside the prostatic capsule,
- Cancer in the seminal vesicle(s), and
- Detectable PSA levels.

If test results find no high-risk features or cancer in the lymph nodes, no more treatment is needed. You may start observation.

EBRT or observation is an option for when there are high-risk features but no cancer in lymph nodes. EBRT will target areas where the cancer cells have likely spread. Treatment will be started after you've healed from the operation.

There are two treatment options if cancer is found in lymph nodes. The first option is to start ADT now. EBRT may be given with ADT. If your PSA levels are undetectable, a second option is to start observation. Supportive care with ADT can be started if the levels rise.

For adjuvant ADT, an LHRH antagonist or LHRH agonist is advised. It can be given on an intermittent schedule to reduce its side effects. However, the benefits of ADT in this case are unclear.

Regional cancer

Guide 12. Treatment

What are the options?

- EBRT + ADT for 2–3 years
- Orchiectomy
- LHRH agonist ± antiandrogen
- LHRH antagonist

Metastatic cancer

Guide 13. Treatment

What are the options?

- Orchiectomy
- LHRH agonist ± antiandrogen for ≥ 7 days to prevent testosterone flare
- LHRH agonist + antiandrogen
- LHRH antagonist
- Continuous ADT and docetaxel with or without prednisone for six 3-week cycles

Guide 12 lists the treatment options for men with regional cancer. Regional cancer has spread to nearby lymph nodes but not to distant sites.

The first option is EBRT with long-term ADT. Long-term ADT may consist of an LHRH antagonist or LHRH agonist. However, doctors often use CAB, which includes an antiandrogen. CAB may increase side effects but may also control the growth of prostate cancer for a longer period of time. If you will receive ADT, it will be given before, during, and after radiation therapy for a total of 2 to 3 years.

Other options for regional cancers consist of only using ADT. ADT is used to control cancer growth. It can consist of surgical castration with a bilateral orchiectomy or medical castration with an LHRH antagonist or agonist. Both methods for castration work equally well. LHRH antagonists and agonists can be given on an intermittent schedule to reduce side effects.

Guide 13 lists the treatment options for men with metastatic cancer. Metastatic cancer has spread to distant sites. The growth of these cancers can be controlled with treatment.

ADT is advised for metastases. It can consist of surgical castration with a bilateral orchiectomy or medical castration with an LHRH antagonist or agonist. Both methods for castration work equally well.

LHRH agonists can cause an increase in testosterone for several weeks. This increase is called a “flare.” Flare can cause pain if bone metastases can be seen on imaging tests (overt metastases). The pain doesn't mean the cancer is growing. Flare can also cause paralysis if the metastases are located in weight-

bearing bones (legs or spine). To prevent the flare, an antiandrogen can be given for 7 or more days, starting before or along with the LHRH agonist.

Another option for ADT is long-term use of an antiandrogen with an LHRH agonist. This is a form of CAB. However, CAB is no better than castration alone for metastases. Moreover, it may lead to higher costs and worse side effects.

The risks for side effects can be reduced by intermittent use of ADT. Intermittent treatment improves quality of life without affecting survival. It often begins with continuous treatment that is stopped after about 1 year. ADT is resumed when a certain PSA level is reached or symptoms appear. PSA levels that trigger restarting treatment usually are 10, 20, or 40 ng/mL.

A newer option for metastatic disease is continuous ADT with docetaxel. Prednisone may or may not be given with these drugs. More research is needed to learn if this option can help control low-volume cancers. Low-volume disease is defined as 1) no metastases in internal organs (visceral disease); and 2) fewer than four bone metastases.

Treatment guide: Monitoring



6 Treatment Guide: Monitoring

68 Reducing ADT risks

This section lists treatment options to prevent or control health problems caused by hormone therapy.

69 Initial treatment results

This section lists the tests used to check the results of initial treatment.

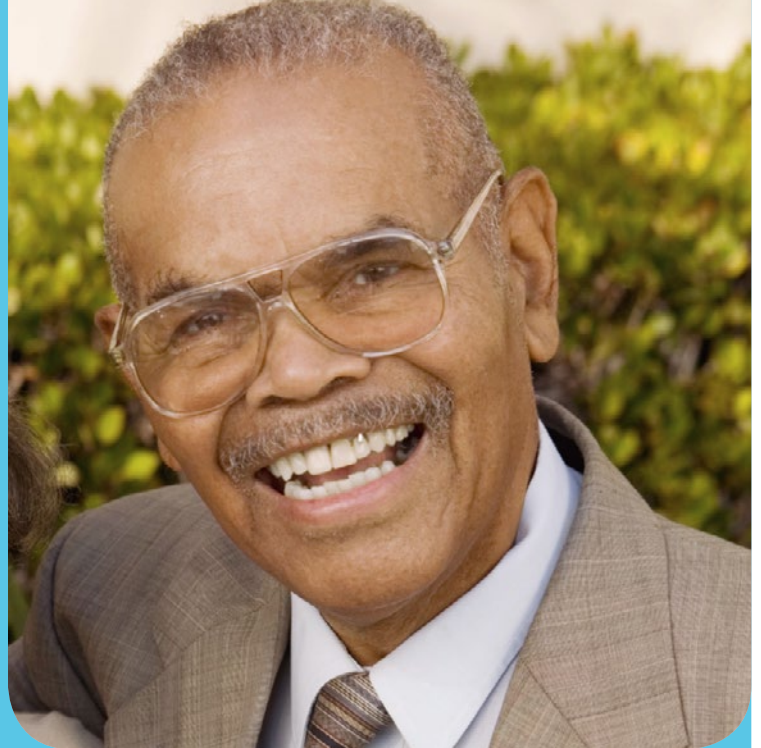
70 Treatment after prostatectomy

This section lists treatment options for cancer that remains or returns after surgical treatment.

72 Treatment after radiation therapy

This section lists treatment options for cancer that remains or returns after radiation therapy.

74 Review



Reducing ADT risks

Guide 14. Health care for ADT risks

Health risk	What are the options?
Osteoporosis	<ul style="list-style-type: none"> • Calcium and vitamin D3 if older than 50 years • Denosumab, zoledronic acid, or alendronate if at high risk for bone fracture
Diabetes	<ul style="list-style-type: none"> • Follow guidelines for general population
Heart (cardiovascular) disease	<ul style="list-style-type: none"> • Follow guidelines for general population

Guide 14 lists some risks of ADT and ways to reduce them. One known risk of ADT is the thinning and weakening of bones (osteoporosis). Calcium and vitamin D3 taken every day may help prevent or control osteoporosis. Both are advised if you are older than 50 years old. Your blood should be tested to ensure the proper levels.

If you are at high risk for bone fracture, there are drugs that may strengthen your bones. Before treatment, you should receive a DEXA (dual energy x-ray absorptiometry) scan to measure your bone density. Denosumab, zoledronic acid, or alendronate are recommended. Denosumab is injected under the skin. Zoledronic acid is injected into a vein. Alendronate is a pill that is swallowed. One year after treatment has started, another DEXA scan is recommended.

Denosumab, zoledronic acid, and alendronate have possible side effects. They have been linked to osteonecrosis—bone tissue death—of the jaw. Other side effects are hypocalcemia and arthralgias. You may be at higher risk of jaw









osteonecrosis if you already have dental problems. Thus, it's important to get a dental exam and dental treatment before starting any of these drugs.

Diabetes and cardiovascular disease are common in older men. ADT increases the risk for these diseases. Thus, screening and treatment to reduce your risk for these diseases are advised.

ADT and other hormone therapies will increase your risk for other health conditions as discussed in Part 4. These risks included erectile dysfunction, fatigue, hot flashes, breast tenderness and growth, diarrhea, weight gain, liver injury, and so forth. There are ways to prevent or treat many of these side effects. Examples include exercise for fatigue, antidepressant drugs for hot flashes, and radiation to prevent breast growth. Talk to your treatment team about ways to manage risks of hormone therapy.

Initial treatment results

Guide 15. Tests used

Risk group		Test		How often is this test needed?
Very-low-, low-, intermediate-, high-, and very-high-risk cancers treated for cure		PSA		<ul style="list-style-type: none"> • Every 6–12 months for 5 years <ul style="list-style-type: none"> ◦ If normal results, then PSA every year
		DRE		<ul style="list-style-type: none"> • Every year unless PSA is undetectable
Very-high-risk, regional, and metastatic cancers not treated for cure		Physical exam		<ul style="list-style-type: none"> • Every 3–6 months
		PSA		<ul style="list-style-type: none"> • Every 3–6 months

Guide 15 lists the tests used to assess the results of initial treatment. For many men, the goal of initial treatment is to cure the cancer. A cure is possible when the cancer has not spread far. The cancer may have been cured if tests find no signs of cancer after treatment. An undetectable PSA level after treatment is a good sign. However, prostate cancer returns in some men after having no signs of cancer for a period of time.

DRE and PSA testing done on a regular basis may catch a recurrence early. A DRE can find a recurrence near the prostate. An increase in the PSA level can be a sign of recurrence either near the prostate or in other areas. Besides PSA level, your doctor will assess the PSA doubling time and velocity.

If the goal of your initial treatment was to cure the cancer, PSA testing every 6 to 12 months for 5 years is recommended. However, PSA testing every 3 months may be needed if you have a high risk of recurrence. If PSA levels remain

normal during the 5 years, then PSA testing can be done every year. A DRE can also help to find a recurrence of prostate cancer early as well as cancer in the rectum or colon.

If your initial treatment controls but doesn't cure the cancer, you should be checked often by a doctor. In addition to PSA testing, a complete physical exam is recommended. A physical exam may tell if the cancer is still growing despite undergoing treatment.

Treatment after prostatectomy

Guide 16. Treatment by M stage

Health tests		Test results		What are the options?
Main tests: <ul style="list-style-type: none"> PSA doubling time Possible tests: <ul style="list-style-type: none"> Chest x-ray CT/MRI, TRUS, or both Bone scan PET scan Biopsy 	➡	No distant metastases (M0 stage)	➡	• EBRT ± ADT for 2–3 years
			➡	• Observation
	➡	Distant metastases (M1 stage)	➡	• ADT ± EBRT to distant site
			➡	• Observation

After a radical prostatectomy, your PSA level should fall to near zero since the whole prostate was removed. If this doesn't happen, it may be a sign of persistent cancer. Persistent cancer is cancer that was not completely removed or destroyed by initial treatment. If tests find that your PSA level increases twice in a row after falling to near zero, the cancer may have returned (recurrence).

Guide 16 lists the tests and treatment options when PSA scores or a DRE suggest there's cancer. Since high PSA levels don't always mean cancer is present, tests to find distant metastases may be done. A fast PSA doubling time is a sign of aggressive cancer with possible spread to the bone. A chest x-ray, CT, MRI, or TRUS may be used to look for cancer spread to lymph nodes or other organs. A bone scan shows if the cancer has spread to the bone. It is usually done when there are symptoms of bone metastases or when your PSA level is rising quickly.

If imaging tests suggest there's cancer near to where the prostate was, a biopsy can be used to confirm if cancer is present. A biopsy may be done under the guidance of MRI images combined with real-time ultrasound images. This type of biopsy is called MRI-US fusion biopsy and may help detect higher-grade cancers. Higher-grade cancers include those with Gleason score 7 through 10.

If there is little reason to suspect distant metastases, EBRT with or without long-term ADT is advised. However, observation may be a better choice depending on your overall health and personal wishes. For long-term ADT, an LHRH antagonist or LHRH agonist may be used. However, doctors often use CAB, which includes an antiandrogen. Side effects may be worse with CAB, but CAB may control cancer growth for a longer period of time. If you will receive ADT, it will be given before, during, and after radiation therapy for a total of 2 to 3 years.

Treatment after radiation therapy

Guide 17. Local treatment isn't an option

What are the options?

- ADT listed in Part 7
- Observation

Guide 18. Local treatment may be an option

Health tests		Test results		What are the options?
<p><i>Main tests:</i></p> <ul style="list-style-type: none"> • PSA doubling time • Chest x-ray • Bone scan • Prostate MRI <p><i>Possible tests:</i></p> <ul style="list-style-type: none"> • Abdominal and pelvic CT/MRI • C-11 choline PET • TRUS biopsy 	➔	Cancer isn't found in prostate or other areas	➔	• Observation
			➔	• ADT
			➔	• Clinical trial
	➔	Cancer is found in prostate but hasn't spread	➔	• Observation
			➔	• Radical prostatectomy + PLND
			➔	• Cryosurgery
			➔	• Brachytherapy
➔	Metastases	➔	• ADT listed in Part 7	

After radiation therapy, PSA levels usually fall to 0.3 ng/mL or below. If your PSA increases by at least 2 ng/mL after falling to low levels, the cancer may have returned. There are other changes in PSA that may be a sign of recurrence. Thus, your doctor may assess if the cancer has returned before the PSA level increases by 2 ng/mL. Signs of cancer also may be found by a DRE.

This section lists what health care is advised when PSA scores or a DRE suggest there's cancer. Options are based on if you may be able to have local treatment. Local treatment is an option if: 1) the clinical stage was T1 or T2; 2) initial tests found no lymph node metastases or weren't done; 3) you're likely to live at least another 10 years; and 4) your current PSA level is below 10.

Guide 17 lists treatment options for when local treatment isn't an option. You may not meet the conditions for local treatment or may have metastases. In this case, your options include ADT or observation. Read Part 7 for more information.

Guide 18 lists test and treatment options for when local treatment may be an option. To confirm that local treatment is right for you, your doctors will assess where the cancer has grown. A fast PSA doubling time suggests spread beyond the prostate. A chest x-ray, bone scan, and MRI of your prostate should also be done. Possible other tests include a CT or MRI scan of your abdomen and pelvis, a C-11 choline PET scan, and TRUS biopsy of your prostate.

For prostate cancer, a radiotracer called C-11 choline will first be injected into your body before the PET scan. The radiotracer is detected with a special camera during the scan. Prostate cancer cells appear brighter in images than normal cells because they use a lot of choline to quickly build their membrane. Thus, PET can show even small amounts of cancer. However, it is unclear 1) if such PET scans improve

outcomes in this setting, and 2) how results should be used for decisions about health care.

A prostate biopsy may be done under the guidance of MRI images combined with real-time ultrasound images. This type of biopsy is called MRI-US fusion biopsy and may help detect higher-grade cancers. Higher-grade cancers include those with Gleason score 7 through 10.

Sometimes the prostate biopsy and imaging tests find no cancer despite rising PSA levels. One option in this case is to continue observation until cancer growth is confirmed. Another option is to start ADT. When to start ADT should be influenced by PSA velocity, your anxiety as well as your doctor's concern about cancer growth, and your feelings about side effects. A third option is to enroll in a clinical trial.

There are four options if cancer has returned in the prostate but has unlikely spread to distant sites. The first option is to continue observation until further cancer growth is found. Another option is radical prostatectomy with PLND. Be aware that the side effects of prostatectomy following radiation therapy are worse than when it used as initial treatment. Other options for local treatment include cryotherapy and brachytherapy. Which treatment you will receive needs to be based on your chances of further cancer growth, treatment being a success, and the risks of the treatment.

After treatment, testing to monitor treatment results will start again. These tests include PSA with either a DRE or physical exam. If the tests suggest the cancer is growing or spreading, imaging tests are advised. Imaging tests should include a chest x-ray, bone scan, and CT or MRI of your abdomen and pelvis. CT and MRI can be done with or without contrast. A C-11 choline PET scan may also be helpful.

Treatment guide: Systemic treatment



7 Treatment guide: Systemic treatment

78 Castration-naïve prostate cancer

This section lists treatment options for advanced cancer that has never been treated with hormone therapy called ADT.

80 Castration-recurrent prostate cancer

This section lists treatment options for advanced cancer that has grown or spread despite low testosterone levels caused by ADT.

88 Review



Castration-naïve prostate cancer

Guide 19. Treatment by M stage

M0 stage

What are the options?

- Orchiectomy
- LHRH agonist ± antiandrogen
- LHRH antagonist
- Observation

M1 stage

What are the options?

- Orchiectomy
- LHRH agonist ± antiandrogen for ≥ 7 days to prevent testosterone flare
- LHRH agonist + antiandrogen
- LHRH antagonist
- Continuous ADT + docetaxel with or without prednisone for 6 cycles

Guide 19 lists options for advanced cancer that has never been treated with castration methods. Options are grouped by whether the cancer is staged M0 or M1.

Orchiectomy

When talking about prostate cancer, castration is a term that means the testicles are making little or no testosterone. It can be achieved by an operation or by medicines. Surgical castration that removes both testes is called a bilateral orchiectomy. This surgery is a type of ADT. Orchiectomy is a treatment option for both M0 and M1 cancers.

LHRH agonist and antagonist

Medical castration works equally as well as surgical castration. Medicines used to cause castration include an LHRH antagonist or agonist. They are a type of ADT. As discussed next, an antiandrogen may be added.

The risk for side effects can be reduced by intermittent use of your medicine. Intermittent treatment improves quality of life without affecting survival. It often begins with continuous treatment that is stopped after about 1 year. Treatment is resumed when a certain PSA level is reached or symptoms appear. PSA levels that trigger restarting treatment usually are 10, 20, or 40 ng/mL.

Antiandrogen

LHRH agonists can cause an increase in testosterone for several weeks. This increase is called a "flare." Flare can cause pain if bone metastases can be seen on imaging tests (overt metastases). The pain doesn't mean the cancer is growing. Flare can also cause paralysis if the metastases are located in weight-bearing bones (legs or spine). To prevent the flare, an antiandrogen can be given for 7 or more days, starting before or along with the LHRH agonist.

Another treatment option is long-term use of an antiandrogen with an LHRH agonist. This is a form of CAB. However, CAB is no better than castration alone for metastases. Moreover, it may lead to higher costs and worse side effects.

Observation

Observation is an option for men without metastases (M0). Observation consists of testing on a regular basis so that supportive care with ADT can be given if symptoms from the cancer are likely to start. Tests during observation include PSA and DRE.

ADT with docetaxel

A newer option for metastatic disease is continuous ADT with 6 cycles of docetaxel. Prednisone may or may not be given with docetaxel. More research is needed to learn if this option can help control low-volume cancers. Low-volume disease is defined as 1) no metastases in internal organs (no visceral disease); and 2) fewer than four bone metastases.

Monitoring

While on hormone therapy, your doctor will monitor treatment results. A rising PSA level suggests the cancer is growing. This increase is called a biochemical relapse. If PSA levels are rising, your testosterone levels should be tested to see if they are at castrate levels (less than 50 ng/dL). If the levels aren't very low, the dose of your treatment will likely be increased. If the levels are very low, you may receive imaging tests to look for metastases.

Castration-recurrent prostate cancer

Guide 20. Treatment for M0 stage

What are my options?

- Clinical trial (preferred)
- Observation
- Secondary hormone therapy
 - Antiandrogen
 - Antiandrogen withdrawal
 - Ketoconazole ± hydrocortisone
 - Corticosteroids
 - DES or other estrogen

In this section, options for CRPC (castration-recurrent prostate cancer) are discussed. Options are based on if the cancer is M0 or M1 stage. Treatment for M0 is addressed below. Treatment for M1 is listed in Guides 21, 22, and 23.

Despite low testosterone levels, CRPC may occur because androgen receptors in the cancer cells become active again. Changes in androgen receptors, called mutations, allow cancer cells to receive signals from unusual sources that activate growth. One unusual source is antiandrogens. Activation of androgen receptors may also occur because the cancer cells or nearby cells start to make testosterone.

Despite that the cancer has returned during ADT, it is important to keep taking it. To treat the cancer, your testosterone levels need to stay at castrate levels. Castrate levels are less than 50 ng/dL. To do so, your doctor may keep you on your current treatment or may switch the type of hormone therapy you are using.

Guide 21. Treatment for M1 stage

First-line immunotherapy

Treatment conditions

- Sipuleucel-T is an option if these statements describe you:
 - The cancer is causing few or no symptoms,
 - There are no liver metastases,
 - You are expected to live more than 6 months, and
 - You are in good health other than having cancer

Other first-line treatment

Options if no metastases in internal organs

- Abiraterone acetate with prednisone
- Docetaxel with prednisone
- Enzalutamide
- Radium-223 for bone metastases causing symptoms
- Clinical trial
- Secondary hormone therapy
 - Antiandrogen
 - Antiandrogen withdrawal
 - Ketoconazole ± hydrocortisone
 - Corticosteroids

Options if metastases in internal organs

- Docetaxel with prednisone
- Enzalutamide
- Abiraterone acetate with prednisone
- Alternative chemotherapy (mitoxantrone)
- Clinical trial
- Secondary hormone therapy
 - Antiandrogen
 - Antiandrogen withdrawal
 - Ketoconazole ± hydrocortisone
 - Corticosteroids

Guide 21 addresses treatment for CRPC with metastases. Despite that the cancer has returned during hormone therapy, it is important to keep taking it. To treat the cancer, your testosterone levels need to stay at castrate levels. Castrate levels are less than 50 ng/dL. To do so, your doctor may keep you on your current treatment or may switch the type of hormone therapy you are using. You should keep taking hormone therapy even if given other types of treatment, such as immunotherapy.

Prostate cancer often spreads to the bones. When prostate cancer invades your bones, they are at risk for injury and disease. Such problems include bone fractures, bone pain, and spinal cord compression. Denosumab every 4 weeks or zoledronic acid every 3 to 4 weeks may help to prevent or delay these problems.

If you have painful bone metastases, there are treatments that may help to lessen the pain. EBRT may be used when pain is limited to a specific area or your bones are about to fracture. Radiopharmaceuticals 89Sr (strontium) or 153Sm (samarium) may relieve pain from widely spread bone metastases that isn't responding to other treatments. Be aware that these treatments can cause your bone marrow to make fewer blood cells, which could prevent you from being treated with chemotherapy.

Radiation therapy used to relieve pain is called supportive care. Supportive care (also called palliative care) doesn't aim to treat cancer but aims to improve quality of life. Ask your treatment team for a supportive care plan to address any symptoms you have and other areas of need.

Sipuleucel-T

Sipuleucel-T is an immunotherapy drug that was tested among men with metastatic CRPC. Research found that men who took sipuleucel-T lived, on average, 4 months longer than men not taking this drug. Your results may be the same, better, or worse.

Sipuleucel-T is only advised for men who meet the conditions listed in the Guide. Sipuleucel-T has not been tested among men with metastases to the internal organs (visceral disease).

For treatments other than sipuleucel-T, a drop in PSA levels or improvement in imaging tests occurs if treatment is working. Be aware that these signs don't occur during sipuleucel-T. Thus, don't be discouraged if your test results don't improve.

There are other options if sipuleucel-T is not right for you. These options for metastatic CRPC are based on whether the cancer is or isn't in the internal organs. Some options in the two groups overlap. However, the order of options differ based what's best for that group.

Enzalutamide and abiraterone acetate

Enzalutamide and abiraterone acetate are newer hormone therapies. Enzalutamide is an antiandrogen that may work better than other antiandrogens. In a clinical trial, it lowered PSA levels and extended life by an average of about 5 months. Abiraterone acetate is taken on an empty stomach with prednisone. This drug has been shown to slow cancer growth. Enzalutamide and abiraterone acetate have only been tested among men with few or no cancer symptoms.

Docetaxel and other chemotherapy

Chemotherapy with hormone therapy is another treatment option. Docetaxel with prednisone on an every-3-week schedule is the preferred treatment option if the cancer is causing symptoms. It is not often used when the cancer isn't causing symptoms. However, your doctor may suggest it if the cancer is growing fast or may have spread to your liver.

If your PSA level rises while taking docetaxel, it doesn't mean without doubt that the treatment has failed. Your doctor may suggest that you keep taking docetaxel until it is clear that the cancer has grown or

side effects are too severe. If docetaxel's side effects are too severe, you may be given mitoxantrone. Mitoxantrone is a chemotherapy drug. It may improve your quality of life, but it isn't likely to increase how long you will live.

Radium-223

Newer research supports use of radium-223 if the cancer has metastasized to the bone but not to the internal organs. In clinical trials, radium-223 was shown to extend the lives of men by an average of about 4 months. Your results may be the same, better, or worse. Radium-223 also reduced the pain caused by the bone metastases and the use of pain medication.

Clinical trial

A clinical trial is a type of research that studies how well a treatment works. Because of clinical trials, the treatments in this book are now widely used to help men with prostate cancer. There may be a clinical trial that you may join.

Secondary hormone therapy

Compared to abiraterone acetate, these treatments have only minor benefits. If your first hormone therapy was surgical or medical castration, starting CAB or switching to a new antiandrogen may help. If you're already on CAB, stopping your use of the antiandrogen—known as antiandrogen withdrawal—may help if the cancer cells are using the antiandrogen to grow. This effect is called the antiandrogen withdrawal response and usually lasts several months. Other medicines that may lower testosterone levels include ketoconazole with or without hydrocortisone, steroids, DES, and other estrogens.

Guide 22. Treatment after enzalutamide or abiraterone

Options if no metastases in internal organs

- Docetaxel with prednisone
- Abiraterone acetate with prednisone
- Enzalutamide
- Radium-223 for bone metastases causing symptoms
- Sipuleucel-T
- Clinical trial
- Secondary hormone therapy
 - Antiandrogen
 - Antiandrogen withdrawal
 - Ketoconazole ± hydrocortisone
 - Corticosteroids
 - DES or other estrogen
- Best supportive care

Options if metastases in internal organs

- Docetaxel with prednisone
- Clinical trial
- Abiraterone acetate with prednisone
- Enzalutamide
- Secondary hormone therapy
 - Antiandrogen
 - Antiandrogen withdrawal
 - Ketoconazole ± hydrocortisone
 - Corticosteroids
 - DES or other estrogen
- Best supportive care

Guide 22 lists treatment options for M1 disease following enzalutamide or abiraterone. These options are based on whether the cancer is or isn't in the internal organs. Some options in the two groups overlap. However, the order of options differ based what's best for that group.

Docetaxel with prednisone on an every-3-week schedule is preferred for cancer that is causing symptoms. Abiraterone with prednisone can be received if you took enzalutamide before and enzalutamide can be received if you took abiraterone acetate before.

Radium-223 is an option for metastases that occur mostly in the bones and not in the internal organs. Sipuleucel-T may also be used for CRPC that hasn't spread to internal organs. Read Guide 21 for more details.

Other options to consider are clinical trials and secondary hormone therapy. Joining a clinical trial is strongly supported. It may give you access to new treatments. Secondary hormone therapy may have minor benefits. All men with CRPC should receive best supportive care.

Guide 23. Treatment after docetaxel

Options if no metastases in internal organs

- Enzalutamide
- Abiraterone acetate with prednisone
- Cabazitaxel with prednisone
- Radium-223 for bone metastases causing symptoms
- Sipuleucel-T
- Clinical trial
- Docetaxel rechallenge
- Alternative chemotherapy (mitoxantrone with prednisone)
- Secondary hormone therapy
 - Antiandrogen
 - Antiandrogen withdrawal
 - Ketoconazole ± hydrocortisone
 - Corticosteroid
 - DES or other estrogen
- Best supportive care

Options if metastases in internal organs

- Enzalutamide
- Abiraterone acetate with prednisone
- Cabazitaxel with prednisone
- Clinical trial
- Docetaxel rechallenge
- Alternative chemotherapy (mitoxantrone with prednisone)
- Secondary hormone therapy
 - Antiandrogen
 - Antiandrogen withdrawal
 - Ketoconazole ± hydrocortisone
 - Corticosteroid
 - DES or other estrogen
- Best supportive care

8

Making treatment decisions



8 Making treatment decisions

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Having cancer is very stressful. While absorbing the fact that you have cancer, you have to learn about tests and treatments. In addition, the time you have to accept a treatment plan feels short. Parts 1 through 7 described the cancer and the test and treatment options recommended by NCCN experts. These options are based on science and agreement among NCCN experts. Part 8 aims to help you make decisions that are in line with your beliefs, wishes, and values.

It's your choice

The role patients want in choosing their treatment differs. You may feel uneasy about making treatment decisions. This may be due to a high level of stress. It may be hard to hear or know what others are saying. Stress, pain, and drugs can limit your ability to make good decisions. You may feel uneasy because you don't know much about cancer. You've never heard the words used to describe cancer, tests, or treatments. Likewise, you may think that your judgment isn't any better than your doctors'.

Your doctors will give you the information you need to make an informed choice. In early-stage disease, there are often multiple good options. It is good news to have multiple options.

Questions to ask your doctors

You will likely meet with experts from different fields of medicine. Strive to have helpful talks with each person. Prepare questions before your visit and ask questions if the person isn't clear. You can also record your talks and get copies of your medical records. It may be helpful to have your spouse, partner, or a friend with you at these visits. They can help to ask questions and remember what was said. Suggested questions to ask include:

What's my diagnosis and prognosis?

It's important to know that there are different types of cancer. Cancer can greatly differ even when people have a tumor in the same organ. Based on your test results, your doctors can tell you which type of cancer you have. He or she can also give a prognosis. A prognosis is a prediction of the pattern and outcome of a disease. Knowing the prognosis may affect what you decide about treatment.

1. Where did the cancer start? In what type of cell?
2. Is this cancer common?
3. What is the cancer stage? Does this stage mean the cancer has spread far?
4. What is the grade of the cancer? Does this grade mean the cancer will grow and spread fast?
5. What other test results are important to know?
6. How often are these tests wrong?
7. Would you give me a copy of the pathology report and other test results?
8. Can the cancer be cured? If not, how well can treatment stop the cancer from growing?

What are my options?

There is no single treatment practice that is best for all men. There is often more than one treatment option along with clinical trial options. Your doctor will review your test results and recommend treatment options.

1. What will happen if I do nothing?
2. Can I just carefully monitor the cancer?
3. Do you consult NCCN recommendations when considering options?
4. Are you suggesting options other than what NCCN recommends? If yes, why?
5. How do my age, health, and other factors affect my options?
6. Which option is proven to work best?
7. Which options lack scientific proof?
8. What are the benefits of each option? Does any option offer a cure? Are my chances any better for one option than another? Which option spares the most healthy tissue? Is any option less invasive? Less time-consuming? Less expensive?
9. What are the risks of each option? What are possible complications? What are the rare and common side effects? Short-lived and long-lasting side effects? Serious or mild side effects? Other risks?

What does each option require of me?

Many men consider how each option will practically affect their lives. This information may be important because you have family, jobs, and other duties to take care of. You also may be concerned about getting the help you need. If you have more than one option, choosing the option that is the least taxing may be important to you:

1. Will I have to go to the hospital or elsewhere? How often? How long is each visit?
2. How do I prepare for treatment?
3. Should I bring someone with me when I get treated?
4. Will the treatment hurt?
5. How much will the treatment cost me? What does my insurance cover?
6. Is home care after treatment needed? If yes, what type?
7. How soon will I be able to manage my own health?
8. When will I be able to return to my normal activities?

Weighing your options

Deciding which option is best can be hard. Doctors from different fields of medicine may have different opinions on which option is best for you. This can be very confusing. Your spouse or partner may disagree with which option you want. This can be stressful. In some cases, one option hasn't been shown to work better than another, so science isn't helpful. Some ways to decide on treatment are discussed next.

2nd opinion

The time around a cancer diagnosis is very stressful. People with cancer often want to get treated as soon as possible. They want to make their cancer go away before it spreads farther. While cancer can't be ignored, there is time to think about and choose which option is best for you.

You may wish to have another doctor review your test results and suggest a treatment plan. This is called getting a 2nd opinion. You may completely trust your doctor, but a 2nd opinion on which option is best can help.

Copies of the pathology report, a DVD of the imaging tests, and other test results need to be sent to the doctor giving the 2nd opinion. Some people feel uneasy asking for copies from their doctors. However, a 2nd opinion is a normal part of cancer care.

When doctors have cancer, most will talk with more than one doctor before choosing their treatment. What's more, some health plans require a 2nd opinion. If your health plan doesn't cover the cost of a 2nd opinion, you have the choice of paying for it yourself.

If the two opinions are the same, you may feel more at peace about the treatment you accept to have. If the two opinions differ, think about getting a 3rd opinion. A 3rd opinion may help you decide between your options. Choosing your cancer treatment is a

very important decision. It can affect your length and quality of life.

Decision aids

Decision aids are tools that help people make complex choices. For example, you may have to choose between two options that work equally as well. Sometimes making a decision is hard because there is a lack of science supporting a treatment.

Decision aids often focus on one decision point. In contrast, this book presents tests and treatment options at each point of care for large groups of patients. Well-designed decision aids include information that research has identified as what men need to make decisions. They also aim to help you think about what's important based on your values and preferences.

Support groups

Besides talking to health experts, it may help to talk to men who have walked in your shoes. Support groups often consist of men at different stages of treatment. Some may be in the process of deciding while others may be finished with treatment. At support groups, you can ask questions and hear about the experiences of other men with prostate cancer.

Compare benefits and downsides

Every option has benefits and downsides. Consider these when deciding which option is best for you. Talking to others can help identify benefits and downsides you haven't thought of. Scoring each factor from 0 to 10 can also help since some factors may be more important to you than others.

Websites

American Cancer Society

www.cancer.org/cancer/prostatecancer/index

California Prostate Cancer Coalition (CPCC)

prostatecalif.org

Decision Aids

Active surveillance

www.uofmhealth.org/health-library/abo8743#abo8744

Surgery vs. Radiation

www.uofmhealth.org/health-library/tc1702#uf10114

National Alliance of State Prostate Cancer Coalitions (NASPCC)

www.naspcc.org

Malecare Cancer Support

www.malecare.org

National Coalition for Cancer Survivorship

www.canceradvocacy.org/toolbox

NCCN

www.nccn.org/patients

Nomograms

nomograms.mskcc.org/Prostate/index.aspx

Prostate Cancer Foundation

www.pcf.org

Prostate Conditions Education Council (PCEC)

prostateconditions.org

Prostate Health Education Network (PHEN)

prostatehealthed.org

Social Security's Life expectancy

www.ssa.gov/OACT/STATS/table4c6.html

Us TOO!

www.ustoo.org

ZERO - The End of Prostate Cancer

zerocancer.org

Glossary

Dictionary Acronyms

Dictionary

active surveillance

Delay of treatment with ongoing testing to watch for cancer growth.

androgen deprivation therapy (ADT)

Treatment that stops the testicles from making testosterone.

antiandrogen

A drug that stops the action of the hormone testosterone.

bilateral orchiectomy

Surgical removal of both testicles from the body.

biopsy

The removal of tissue or fluid samples from your body to test for disease.

brachytherapy

The placement of radioactive objects near or in a tumor.

castration-recurrent prostate cancer (CRPC)

Cancer that has grown or spread despite taking medicine that reduced testosterone to low levels.

combined androgen blockade (CAB)

Castration treatment used with an antiandrogen.

computed tomography (CT)

A test that uses x-rays to view body parts.

cryosurgery

Treatment that freezes tissue to kill cancer cells.

digital rectal exam (DRE)

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

dry orgasm

Having an orgasm without ejaculation.

dual energy X-ray (DEXA)

A test that measures bone strength.

epididymis

The tube through which sperm travel after leaving the testicles.

erectile dysfunction

The inability to achieve erections sufficient for intercourse.

external beam radiation therapy (EBRT)

Radiation therapy received from a machine outside the body.

extracapsular extension

Cancer growth through the prostatic capsule.

fatigue

Severe tiredness despite getting enough sleep that limits one's ability to function.

fine-needle aspiration

Use of a thin needle to remove fluid or tissue from the body.

fistula

A passage between two organs that aren't normally connected.

flare

An increase in testosterone after starting castration treatment.

gene

Information in cells for building new cells.

Gleason grade

A score from 1 (best) to 5 (worst) made by a pathologist based on the ability of prostate cells to form glands. The primary grade is the most common pattern, and the secondary grade is the second most common pattern. The two grades are summed to give a Gleason score.

Gleason score

The grading system for prostate cancer.

high-dose rate (HDR) brachytherapy

Radioactive objects are removed from the tumor after the radiation dose has been given.

hormone therapy

Treatment that stops the making or action of hormones in the body; androgen deprivation therapy.

image-guided radiation therapy (IGRT)

Radiation therapy that uses imaging tests during treatment to better target the tumor.

immunotherapy

Treatment that uses the immune system to fight disease.

intensity-modulated radiation therapy (IMRT)

Radiation therapy that uses small beams of different intensities.

intermittent treatment

Alternating periods of time on and off treatment.

interstitial radiation

A type of radiation therapy that places radioactive objects in the tumor.

laparoscopic radical prostatectomy

Removal of the prostate through several small cuts in the pelvis.

life expectancy

The number of years a person is likely to live.

low-dose rate (LDR) brachytherapy

Radioactive objects are inserted into the tumor and left to decay.

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.

lymph

A clear fluid containing white blood cells.

lymph node

A small clump of special immune cells. There are thousands of lymph nodes located throughout the body.

magnetic resonance imaging (MRI)

A test that uses a magnetic field and radio waves to view the parts of the body and how they are working.

magnetic resonance imaging-ultrasound (MRI-US) fusion biopsy

Removal of a tissue sample using two types of imaging tests to help insert medical tools.

metastasis

The growth of cancer beyond local tissue.

multi-parametric magnetic resonance imaging (mpMRI)

An imaging test that measures many features of tissue to detect cancer.

mutation

An abnormal change in the coded instructions within cells.

nerve-sparing prostatectomy

One or both bundles of cavernous nerves aren't removed during a prostatectomy.

nomogram

A tool that uses clinical information to predict an outcome.

nuclear medicine specialist

A doctor who's an expert in tests that use radioactive substances.

observation

Testing on a regular basis so that supportive care can be given if cancer symptoms are likely to start.

open radical prostatectomy

Removal of the prostate through one large cut.

overflow incontinence

Leakage of urine due to an overly full bladder.

pathologist

A doctor who specializes in testing cells to identify disease.

pelvic lymph node dissection (PLND)

Removal of the lymph nodes in the pelvis.

perineum

The area in men between the scrotum and anus.

persistent cancer

Cancer not completely removed or destroyed by treatment.

positron emission tomography (PET)

Use of radioactive material to see the shape and function of body parts.

primary grade

The most common pattern of prostate cells' ability to form into glands.

primary treatment

The main treatment used to cure or control cancer.

prognosis

A prediction of the pattern and outcome of a disease based on clinical information.

prostate

A male gland that makes fluid that protects sperm from the acid in the vagina.

prostate-specific antigen (PSA)

A protein made by the prostate.

prostate-specific antigen (PSA) density

Comparison of the level of PSA to the size of the prostate.

prostate-specific antigen (PSA) doubling time

The time during which the level of PSA doubles.

prostate-specific antigen (PSA) level

Number of nanograms per milliliter of PSA.

prostate-specific antigen (PSA) velocity

How much the level of PSA changes over time.

radical perineal prostatectomy

Removal of the prostate through one cut made between the scrotum and anus.

radical retropubic prostatectomy

Removal of the prostate through one cut made in the pelvis.

radiologist

A doctor who specializes in reading imaging tests.

radiopharmaceutical

A drug that contains a radioactive substance.

recurrence

The return of cancer after a disease-free period.

risk group

Prediction of a person's chances for an event based on if he or she matches the criteria of a group.

robotic-assisted radical prostatectomy

Removal of the prostate by a surgeon with a machine that holds the surgical tools.

secondary grade

The second most common pattern of prostate cells' ability to form into glands.

seminal vesicle

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

side effect

An unhealthy or unpleasant physical or emotional response to a test or treatment.

stress incontinence

Leakage of urine when pressure is exerted on the bladder from sneezing, coughing, exercise, and so forth.

supportive care

Treatment for symptoms of a disease.

surgical margin

Normal tissue around the edge of a tumor that is removed during an operation.

testosterone

A hormone that helps the sexual organs in men to work.

three-dimensional conformal radiation therapy (3D-CRT)

Radiation therapy that uses beams that match the shape of the tumor.

transrectal ultrasound (TRUS)

A type of ultrasound that takes pictures of the prostate through the rectum.

transurethral resection of the prostate (TURP)

Surgical removal of some prostatic tissue through the urethra.

triple androgen blockade

Finasteride or dutasteride with combined androgen blockade.

urethra

A tube that expels urine from the body; it also expels semen in men.

urge incontinence

The feeling of having to rush to urinate or you'll leak urine.

urinary incontinence

Inability to control the release of urine from the bladder.

urinary retention

Inability to empty the bladder.

visceral disease

Spread of cancer cells from the first tumor to internal organs.

Acronyms

3D-CRT

three-dimensional conformal radiation therapy

ADT

androgen deprivation therapy

AJCC

American Joint Committee on Cancer

CAB

combined androgen blockade

CAM

complementary and alternative medicine

CRPC

castration-recurrent prostate cancer

CT

computed tomography

DES

diethylstilbestrol

DEXA

dual energy x-ray absorptiometry

DNA

deoxyribonucleic acid

DRE

digital rectal exam

EBRT

external beam radiation therapy

HDR

high-dose rate

HIFU

high-intensity focused ultrasound

IGRT

image-guided radiation therapy

IMRT

intensity-modulated radiation therapy

LDR

low-dose rate

LHRH

luteinizing hormone-releasing hormone

PSA

prostate-specific antigen

mg

milligram

mpMRI

multi-parametric magnetic resonance imaging

MRI

magnetic resonance imaging

MRI-US

magnetic resonance imaging-ultrasound

PET

positron emission tomography

PLND

pelvic lymph node dissection

SBRT

stereotactic body radiotherapy

TRUS

transrectal ultrasound

TURP

transurethral resection of the prostate

VTP

vascular targeted photodynamic

NCCN Abbreviations and Acronyms

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- | | | |
|---|--|-------------------------------|
| Acute Lymphoblastic Leukemia | Hodgkin Lymphoma | Non-Hodgkin's Lymphomas |
| Adolescents and Young Adults (AYAs) with Cancer | Kidney Cancer | Diffuse Large B-cell Lymphoma |
| Breast Cancer | Lung Cancer (Non-Small Cell Lung Cancer) | Follicular Lymphoma |
| Carcinoma in Situ (Stage 0) | Lung Cancer Screening | Mantle Cell Lymphoma |
| Early-Stage (Stages I and II) | Malignant Pleural Mesothelioma | Mycosis Fungoides |
| Stage III Breast Cancer | Melanoma | Peripheral T-cell Lymphoma |
| Stage IV Breast Cancer | Multiple Myeloma | Ovarian Cancer |
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| Chronic Myelogenous Leukemia | Nausea and Vomiting | Prostate Cancer |
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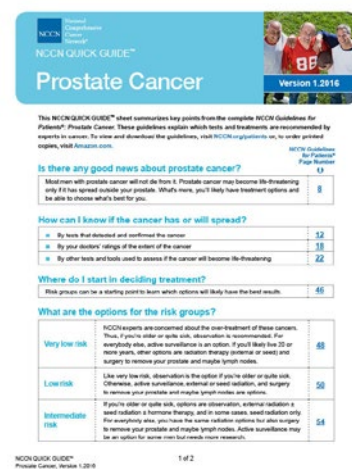


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Version 1.2016

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