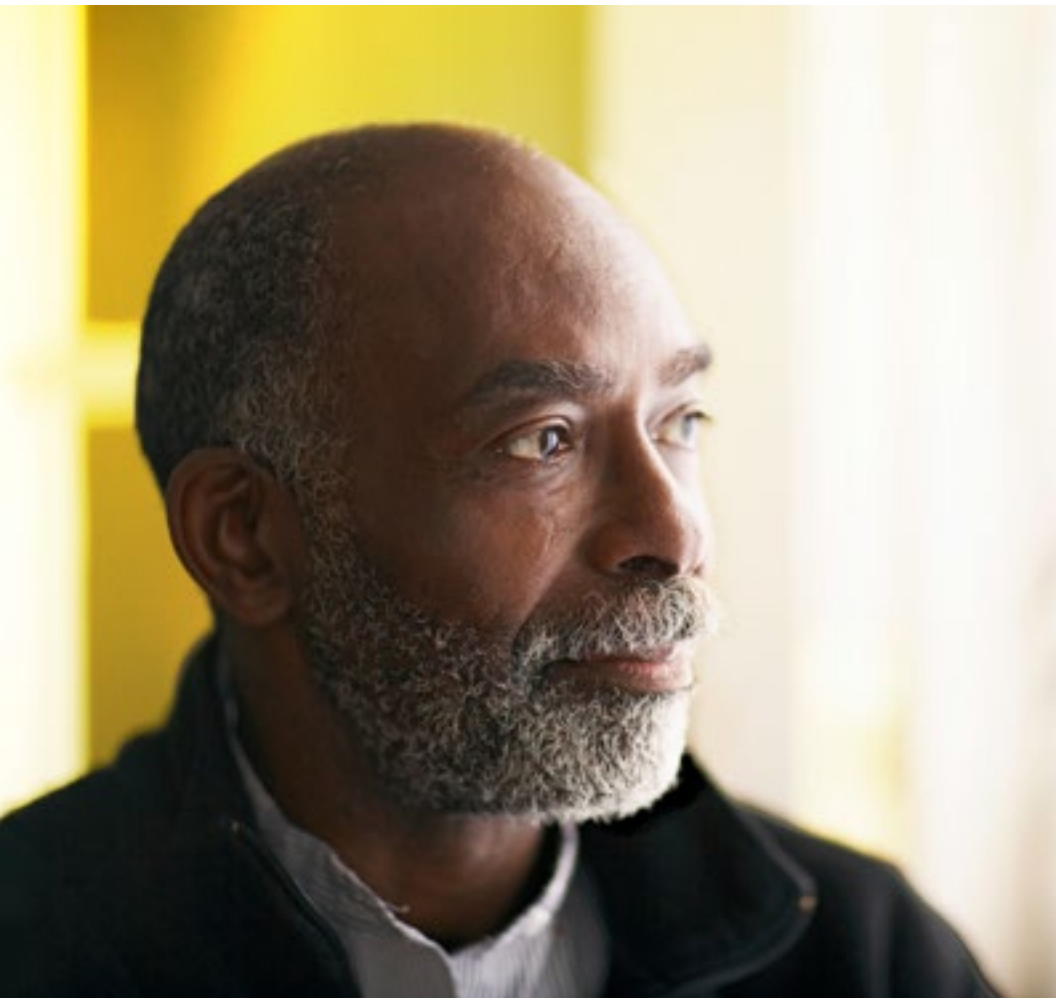
Canadian Cancer Society

Prostate Cancer

From diagnosis to follow-up



Prostate Cancer

From diagnosis to follow-up

We provide a support system for people affected by cancer. Our services help answer your questions about cancer, manage life with cancer, find community and connection, and build wellness and resilience. Many of our programs are available in different languages.

From diagnosis to treatment to life after cancer, you can trust our publications for reliable information that's easy to understand.

We're here to support you.



We have short, easy-to-understand videos on common cancer topics. Visit **cancer.ca/cancerbasics.**

Photographs: © Getty Images
Licensed material is for illustrative purposes only; persons depicted are models.

Table of contents

2 **Part 1: The basics**

4 The prostate

5 Prostate cancer

5 Risks for prostate cancer

8 Symptoms of prostate cancer

9 **Part 2: Diagnosis**

9 Tests to diagnose prostate cancer

13 Where prostate cancer spreads

14 Grading prostate cancer

16 Staging prostate cancer

20 Understanding a prostate cancer diagnosis

21 Questions to ask about diagnosis

23 **Part 3: Treatment**

23 Treatments for prostate cancer

34 Treatments for prostate cancer by stage

37 Clinical trials

37 If you can't have or don't want cancer treatment

38 Questions to ask about treatment

39 **Part 4: Side effects**

40 Side effects of prostate cancer treatment

42 Managing side effects

49 Questions to ask about side effects

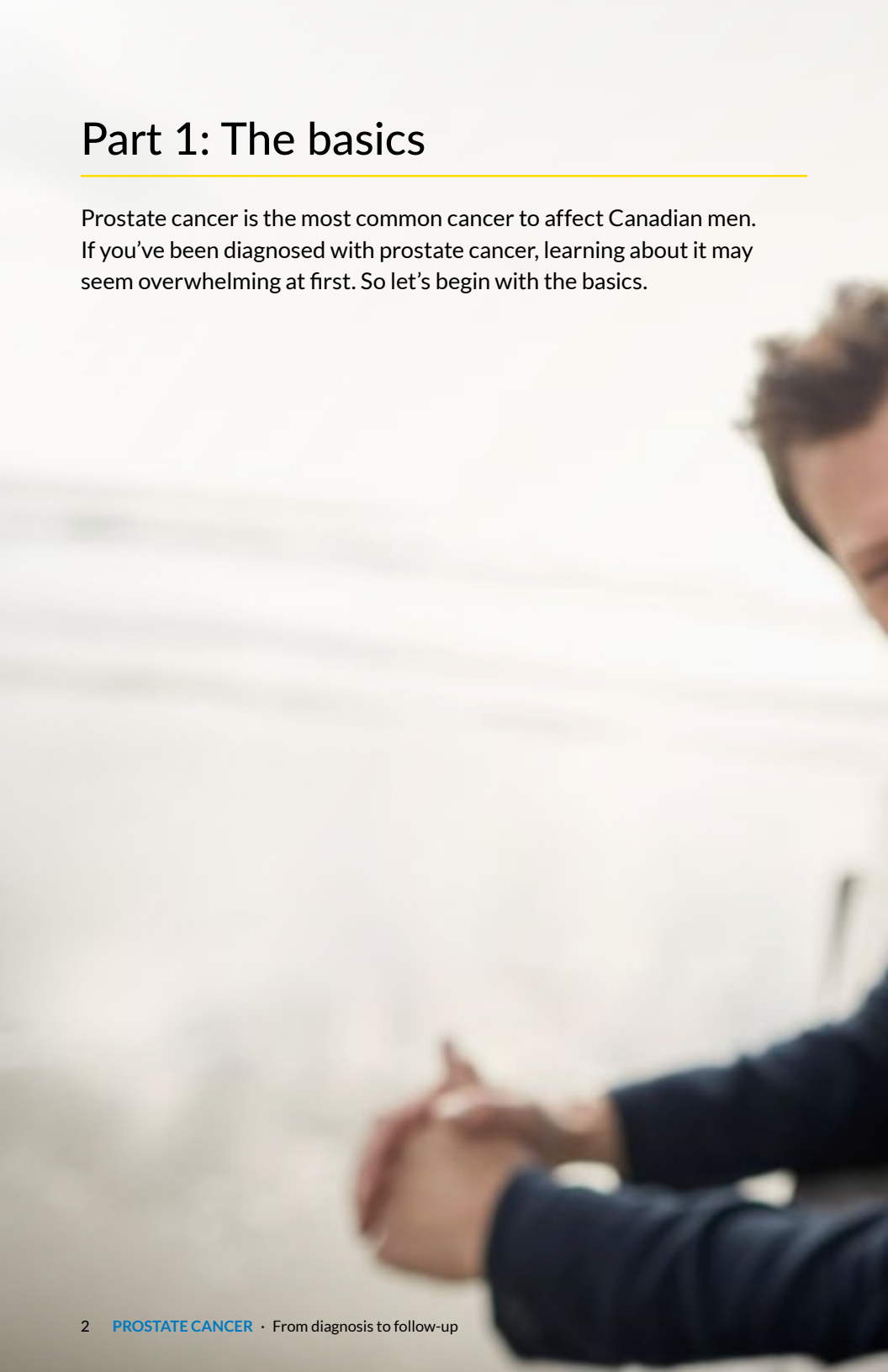
50 **Part 5: Follow-up**

50 Follow-up care for prostate cancer

55 Questions to ask about follow-up

Part 1: The basics

Prostate cancer is the most common cancer to affect Canadian men. If you've been diagnosed with prostate cancer, learning about it may seem overwhelming at first. So let's begin with the basics.

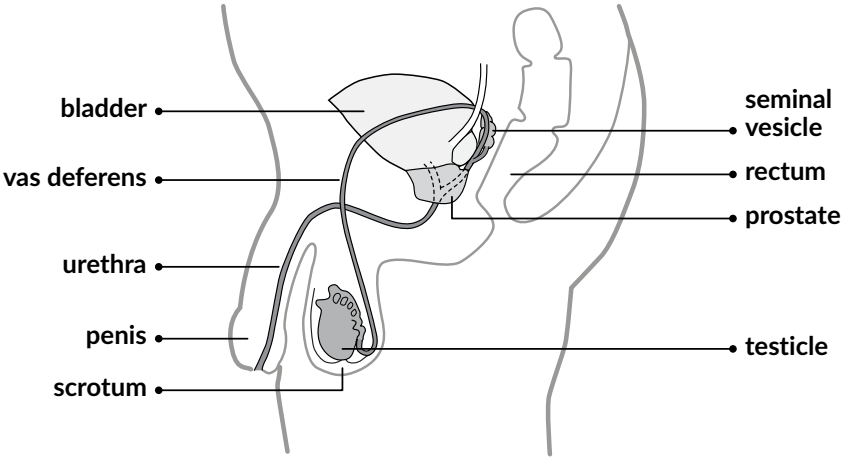




The prostate

The prostate is part of the male reproductive and urinary systems. It is located below the bladder and in front of the rectum. The urethra (tube that carries urine, or pee, and semen out of the body through the penis) goes through the prostate. The main function of the prostate is to add fluid to the ejaculate that protects and nourishes sperm.

Location of the Prostate



© Canadian Cancer Society

The prostate is about the size of a walnut when you are younger, but it may start to get larger when you reach your late 40s and early 50s. The growth of cells in the prostate, both healthy and cancerous, is controlled by a hormone called testosterone.

Prostate cancer

Prostate cancer starts in the cells of the prostate. A cancerous (malignant) tumour consists of cancer cells that can grow into nearby tissue and destroy it. The tumour can also spread (metastasize) to other parts of the body.

Adenocarcinoma, which starts in the prostate gland cells, is the most common type of prostate cancer. It accounts for 95% of all cases.

Prostate cancer usually grows slowly. It can often be completely removed or successfully managed before it has spread outside of the prostate. Older men with prostate cancer often die of other causes. Others may have a type of fast-growing prostate cancer that needs to be treated early.

Risks for prostate cancer

There is no single cause of prostate cancer. But there are some factors that make developing it more likely.

Age
The risk for prostate cancer increases as you get older. The chance of being diagnosed with prostate cancer is greater after age 50. It is most often diagnosed in men in their 60s.

Ethnicity
Prostate cancer occurs in Black men (including men of African or Caribbean ancestry) more often than in men of other ethnicities. Black men are also more likely to have prostate tumours that grow and spread quickly and more likely to die from prostate cancer compared to other men. The reason for this is not clear.

© Canadian Cancer Society 2023

Family history

Having a family history of prostate cancer increases your risk for developing the disease. This risk is higher if one of your first-degree relatives (your father, brother or son) has been diagnosed. The more first-degree relatives with prostate cancer you have, the greater your risk of developing prostate cancer.

Weight

There is strong evidence that having obesity or overweight increases the risk for prostate cancer. Having these conditions makes it more likely that prostate cancer will be diagnosed later. High body fat is also linked with a higher risk of developing prostate cancer that grows and spreads quicker.

Tall adult height

Having a tall adult height increases the risk for prostate cancer. Several factors that lead to tall adult height, such as genetics and rate of growth during childhood, seem to contribute to the greater risk.

Inherited gene mutations

Only a very small number of prostate cancer cases are linked with inherited gene mutations.

It's still possible to develop prostate cancer even if you don't have any of these risk factors. Trans women and non-binary people who were assigned male at birth can also get prostate cancer.



Symptoms of prostate cancer

Prostate cancer usually does not cause any symptoms in its early stages. Symptoms may appear later as the tumour grows and causes changes in the body. Other health conditions can cause the same symptoms as prostate cancer.

Symptoms of prostate cancer include:

- needing to urinate (pee) more often, especially at night
- problems urinating
- a strong or sudden urge to urinate
- being unable to empty the bladder completely
- having difficulty controlling the bladder (called incontinence), which can cause urine to leak and dribble
- burning or pain during urination
- blood in the urine or semen
- painful ejaculation
- pain or stiffness in the back, hips or pelvis that doesn't go away

Part 2: Diagnosis

Several tests are used to diagnose prostate cancer. Many of these tests are also used to find out how far the cancer has spread. Your doctor may also order other tests to check your general health and help plan your treatment.

Tests to diagnose prostate cancer

The following are the most common tests used to diagnose prostate cancer.

Digital rectal exam (DRE)
In a digital rectal exam (DRE), your doctor feels the size and shape of the prostate by inserting a gloved and lubricated finger into the rectum. A healthy prostate feels soft, rubbery, smooth, symmetrical and regular. Any lumps or hard areas in the prostate may indicate cancer and require further testing.

Prostate-specific antigen (PSA) test
The prostate-specific antigen (PSA) test is a simple blood test that your doctor orders to screen for prostate cancer. This test measures the amount of PSA (a protein made by prostate cells) in your blood. A PSA level shows the amount of PSA (in nanograms) per millilitre of blood.

Your PSA level depends on your age. As you get older, your PSA level naturally goes up, but it can also go up and down for many reasons. A higher-than-normal PSA level can be caused by prostate cancer, among other things. If you have a high PSA level, other follow-up tests may be done.

PSA testing usually begins at age 50 but may begin sooner if you have a family history of prostate cancer. Since most prostate cancers can't be felt during a DRE, the PSA test is important in finding prostate cancer at an early stage when it can be managed.

Transrectal ultrasound (TRUS)

An ultrasound uses high-frequency sound waves to make images of parts of the body. A transrectal ultrasound (TRUS) uses an ultrasound probe placed in the rectum to measure the size of the prostate and look for abnormal areas. During a biopsy, TRUS is used to guide a needle to take tissue from the prostate.

TRUS is used to calculate PSA density, which is the level of PSA in the blood in relation to the size (volume) of the prostate. A high PSA density may indicate prostate cancer.

Prostate biopsy

A prostate biopsy may be done if your doctor finds an abnormal area during a DRE or TRUS. It is most often done if your PSA level is higher than normal or has gone up over time.

A prostate biopsy is also called a core biopsy because the doctor uses a thin, hollow needle to collect tissue samples (cores). The needle is guided by a probe. In most cases the doctor takes 10 to 12 samples from the prostate, including samples from any abnormal areas. Collecting the samples can cause some discomfort, so the doctor may inject an anesthetic into the prostate before doing the biopsy.

The samples collected during a prostate biopsy are sent to a lab. A pathology report will say if cancer cells are in the sample.

A positive biopsy means:

- cancer cells were found
- the pathologist will give a Gleason score (grade) and Grade Group for prostate cancer, which describe how aggressive the cancer is and how likely it is to spread

A negative biopsy means:

- no cancer cells were found
- your doctor may do a repeat biopsy because sometimes a biopsy can miss cancer

Magnetic resonance imaging (MRI)

Magnetic resonance imaging (MRI) uses a powerful magnet and radiofrequency waves to make cross-sectional images of organs, tissues, bones and blood vessels. Sometimes a dye (contrast medium) is injected into a vein before the MRI. The dye helps parts of the body show up better in the images.

An MRI is used to:

- look for cancer in the front of the prostate that may be missed with other tests
- look for prostate cancer when the doctor thinks it might be present but hasn't found it with a TRUS or biopsies
- find out the size and location of prostate cancer and whether it has spread
- help plan radiation therapy to treat prostate cancer

An MRI can also be used to see if cancer has spread outside of the prostate, such as to lymph nodes in the pelvis.

Multiparametric MRI is a special type of MRI that uses several images to give more details about the location of the tumour in the prostate, how aggressive it is and if it has spread outside of the prostate. It can also help doctors decide who should have treatment for prostate cancer right away, or if someone can be monitored with tests and exams (called active surveillance).

Bone scan

A bone scan uses bone-seeking radioactive materials (called radiopharmaceuticals) and a computer to create a picture of the bones. It is used to look for cancer that has spread to the bones. You may not need a bone scan if you have a low PSA and a low Gleason score. These factors mean that the cancer is unlikely to have spread outside of the prostate.

A bone scan is also used to check how metastatic prostate cancer (cancer that has spread) responds to treatment.



Computed tomography (CT) scan
A computed tomography (CT) scan uses special x-ray equipment to make cross-sectional images of organs, tissues, bones and blood vessels inside the body. A computer turns the images into detailed pictures.

A CT scan can be used to look for cancer that has spread outside of the prostate, such as to the chest, abdomen or pelvis. Doctors don't usually do a CT scan to look for cancer spread if you have a low PSA level and a low Gleason score. These factors mean that the cancer is less likely to have spread outside of the prostate. A CT scan can also be used to guide a needle during a biopsy of lymph nodes near the prostate.

Where prostate cancer spreads

Cancer cells can spread from one part of the body to another. This spread is called metastasis.

Prostate cancer can spread from the prostate to the:

- tissues and organs around the prostate
- lymph nodes in and outside of the pelvis
- bones
- lungs (rarely)
- liver (very rarely)
- brain (very rarely)

Cancer that has spread to the bones (bone metastasis) is the most common type of prostate cancer spread.

Grading prostate cancer

Grading describes how the cancer cells look compared to normal, healthy cells. Knowing the grade gives your doctor an idea of how quickly the cancer may be growing and how likely it is to spread.

The Gleason classification system is most commonly used to grade prostate cancer. It looks at the pattern (arrangement) of the cancer cells in the prostate.

There are 5 patterns of prostate cancer cells, numbered from 1 to 5. The lower the pattern number, the more cancer cells look, act and are arranged like normal cells. The higher the pattern number, the more abnormal the cancer cells look compared to normal cells. A pathologist will give a grade for each pattern of prostate cancer cells found in the biopsy.

The grade of the cancer corresponds to the pattern number. Gleason patterns 1 and 2 look a lot like normal cells. Gleason pattern 5 looks very abnormal compared to normal cells. Gleason patterns 3 and 4 are somewhere in between. Most prostate cancers have a Gleason pattern of 3, 4 or 5. The Gleason score is the sum of the 2 main patterns seen in your biopsies.

Grade Group

To make the Gleason score easier to understand, doctors developed the Grade Group system. This gives a single score from 1 to 5 based on increasing Gleason scores. For example, Grade Group 1 corresponds to a Gleason score of 6 and Grade Group 5 corresponds to a Gleason score of 9 or 10.

Grade Group	Gleason score	Description
1	6 or less	The cancer is likely to grow and spread very slowly (called well differentiated or low grade).
2	3 + 4 = 7	The cancer is likely to grow and spread slowly (called moderately differentiated or intermediate grade).
3	4 + 3 = 7	The cancer is likely to grow and spread slowly (called moderately differentiated or intermediate grade). Grade Group 3 is more likely to grow and spread than Grade Group 2.
4	8	The cancer is likely to grow and spread quickly (called poorly differentiated or high grade).
5	9 or 10	The cancer is likely to grow and spread quickly (called poorly differentiated or high grade). Grade Group 5 is likely to grow and spread more quickly than Grade Group 4.

Staging prostate cancer

Staging describes or classifies a cancer based on how much cancer there is in the body and where it is when first diagnosed. This is often called the extent of the cancer. Information from tests is used to find out:

- the size of the tumour
- which parts of the organ have cancer
- whether the cancer has spread from where it started
- where the cancer has spread

Your healthcare team uses the stage to plan treatment and estimate the outcome (prognosis). The following staging information is for adenocarcinoma. Other types of prostate cancer are staged differently.

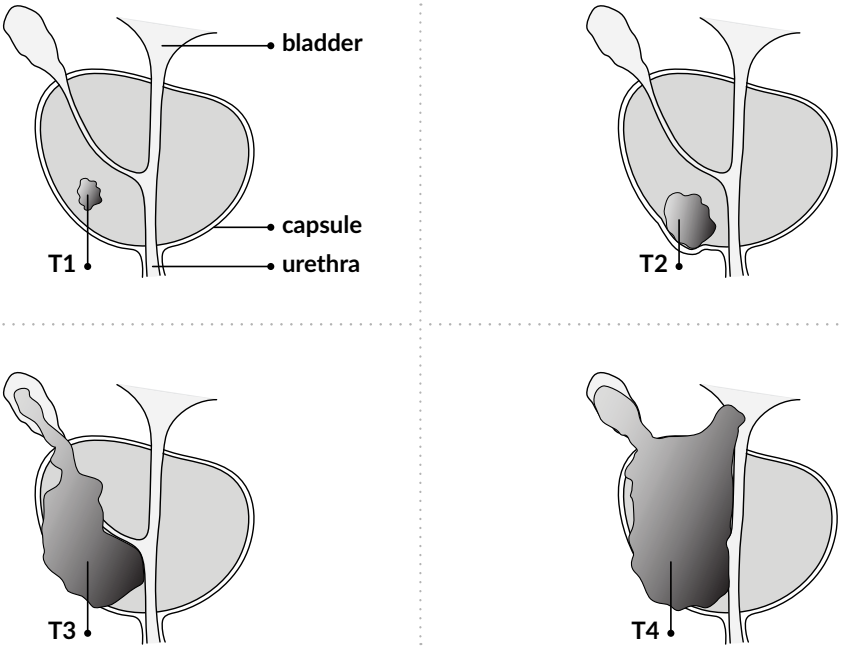
The most common system for staging prostate cancer is the AJCC/UICC TNM staging system. It is based on the following:

T describes the tumour and whether doctors can feel it or see it on imaging tests. It also describes whether the tumour has grown outside of the prostate to the surrounding tissues. T is usually given as a number from 1 to 4. A higher number means that the tumour takes up more of the prostate or that the tumour has grown outside of the prostate into nearby tissues. Some stages are also divided further into a, b or c. An earlier letter means a lower stage.

N describes whether the cancer has spread to lymph nodes near the prostate. N0 means that the cancer has not spread to any nearby lymph nodes. N1 means that it has spread to nearby lymph nodes.

M describes whether the cancer has spread to other parts of the body. M0 means that the cancer has not spread to other parts of the body. M1 means that it has spread.

T1, T2, T3 or T4



© Canadian Cancer Society

Stage	Description
T1	The tumour can't be felt during a DRE or seen on scans. It may be found during a biopsy.
T1a	Cancer is found in 5% or less of the tissue removed by a biopsy.
T1b	Cancer is found in more than 5% of the tissue removed by a biopsy.
T1c	The tumour is found by a needle biopsy in one or both sides of the prostate.
T2	The tumour can be felt during a DRE and seen on scans.
T2a	The tumour is less than half of one side of the prostate.
T2b	The tumour is greater than half of one side of the prostate.
T2c	The tumour is in both sides of the prostate.
T3	The tumour has broken through the outside layer of the prostate gland.
T3a	The tumour has grown outside the prostate but not into the seminal vesicles.
T3b	The tumour has grown outside the prostate and into the seminal vesicles.
T4	The tumour has grown outside the prostate and into nearby structures such as the bladder or rectum.

Recurrent prostate cancer is cancer that has recurred (come back) after it has been treated. If it comes back in the prostate, it's called local recurrence. If it comes back in tissues or lymph nodes close to the prostate, it's called regional recurrence. It can also recur in another part of the body. This is called distant metastasis or distant recurrence.

Recurrent prostate cancer is also diagnosed when the PSA level starts to rise after initial treatment but there are no other signs of cancer. This is called a biochemical recurrence of prostate cancer.

Describing prostate cancer based on spread

Doctors often divide prostate cancers into groups based on whether the cancer has spread.

Localized means that the cancer is only in the prostate. The cancer hasn't grown into nearby tissues or to distant parts of the body.

Locally advanced means that the cancer has spread outside of the prostate but hasn't spread to lymph nodes or distant parts of the body. It is not metastatic.

Metastatic means that the cancer has spread beyond the prostate to lymph nodes or other parts of the body (usually the bones).

Risk groups for localized prostate cancer

Doctors may classify localized prostate cancer into groups based on the risk of the cancer coming back after treatment. They use these risk groups to help them develop treatment plans.

Risk groups are based on the tumour stage, the PSA level and the Grade Group.

Risk group	Tumour stage	Grade Group	PSA level (ng/mL)
very low	T1c	1	less than 10
low	T1a to T2a	1	less than 10
intermediate	T2b to T2c	2 or 3	between 10 and 20
high	T3a	4 or 5	greater than 20
very high	T3b to T4	5	

Understanding a prostate cancer diagnosis

You may feel a bit overwhelmed and confused by all of the levels and scores that make up a prostate cancer diagnosis. But they all play a role in helping your healthcare team understand your diagnosis, how the cancer may behave and how far it has spread. They also help the healthcare team decide what treatment for prostate cancer will work best for you.

Ask your healthcare team to help you fill in the table below to summarize information about your diagnosis.

Characteristics of prostate cancer	Characteristics of my diagnosis
PSA level	
stage	
Gleason score	
Grade Group	
risk group	

Questions to ask about diagnosis

There are a lot of things to think about when you've been diagnosed with prostate cancer, and you may have many questions to ask your healthcare team. Your healthcare team will likely cover most, if not all, of the questions below, but you may have other questions.

It's a good idea to write down the questions you have before your appointments. Take a notebook with you with your questions so you can make sure that you remember to ask them. It also helps if you bring someone with you to take notes and ask any questions you may forget.

- Will I need more tests? What are they?

- Has the cancer spread? Where?

- If the cancer has not spread, how likely is it to spread?



Part 3: Treatment

If you have prostate cancer, your healthcare team will create a treatment plan just for you. It will be based on your health and specific information about the cancer. It's important to remember that while you may be offered certain treatments, someone else with prostate cancer may be offered other treatments. The best treatment for someone else may not be the best treatment for you.

When deciding which treatments to offer for prostate cancer, your healthcare team will consider:

- the type and stage of the cancer
- the grade or Gleason score
- your PSA level
- the risk group (whether treatment is needed urgently or it is safe to wait)
- possible side effects of treatments
- your personal preferences
- your overall health and any medical conditions
- your age and life expectancy
- whether you have symptoms

Treatments for prostate cancer

The following are the most common treatments for prostate cancer.

Active surveillance
During active surveillance, your doctor closely monitors the cancer with tests and exams to check if it is growing or spreading or if your condition is getting worse. They will discuss other treatment options with you when the cancer changes or you develop symptoms.

You may be offered active surveillance if you have a small and low-grade prostate cancer that isn't likely to spread or shorten your life expectancy.

Active surveillance helps avoid side effects that can happen with treatments such as surgery or radiation therapy. There is no evidence so far that people won't live as long when they get active surveillance compared to other treatments. And there is no evidence that active surveillance has other negative effects if or when you start treatment.

During active surveillance, you will have tests every 3 to 6 months to monitor the cancer. Tests may include the PSA test, a physical exam (including a DRE) and a prostate biopsy. Prostate cancer is also commonly monitored by a multiparametric MRI.

Watchful waiting

Many men who are diagnosed with prostate cancer don't need to be treated right away. This is because most prostate cancers grow slowly and are unlikely to spread outside of the prostate.

Older men with prostate cancer that has a very low risk of growing quickly or spreading may be offered watchful waiting. During watchful waiting, no routine tests are done. If symptoms develop, treatment may be used to relieve them. The goal of any future treatment is not to cure the cancer but to control the symptoms (called palliative treatment).

Using watchful waiting helps avoid unnecessary routine testing and side effects that can happen with treatments such as surgery or radiation therapy. Watchful waiting may be used for older men with other serious or life-threatening illnesses.



Surgery

Surgery is usually used to treat cancer that hasn't spread outside of the prostate. The type of surgery you have depends mainly on the stage of the cancer. When planning surgery, your healthcare team will also consider other factors, such as your age, overall health and life expectancy. You may also be offered other treatments.

A *radical prostatectomy* removes the prostate and some tissues around it, including the seminal vesicles. The surgeon may also remove lymph nodes near the prostate (in the pelvis).

Surgeons can use different approaches and techniques to remove the prostate. They can make an incision (cut) to reach the prostate (called an open radical prostatectomy). They can also use laparoscopic or robotic techniques, which are done through smaller incisions in the pelvis. Laparoscopic and robotic types of surgery are less invasive than an open radical prostatectomy. These procedures often result in shorter recovery times, less blood loss, less pain and shorter hospital stays.

A *nerve-sparing radical prostatectomy* aims to avoid damaging the nerves to the penis, which helps reduce the risk of erectile dysfunction. It may be an option with any of the approaches to radical prostatectomy, but it is more successful with early-stage prostate cancer and in younger, sexually active men. Your chances of recovering erections following surgery will depend on your age, your ability to get an erection before surgery and whether the nerves were cut.

It is hard for surgeons to know before surgery if the nerves can be spared. So they decide if nerve-sparing surgery is possible when they see the prostate and tumour during surgery.

Cryosurgery is a procedure that destroys cancer cells by freezing them. It is also called cryoablation, cryosurgical ablation or cryotherapy. Cryosurgery may be used to treat low-risk, early-stage prostate cancer. It may be used if you are unable to have surgery or radiation therapy. Cryosurgery may also be used to treat recurrent prostate cancer.

Transurethral resection of the prostate (TURP) removes part of the prostate through the urethra. The surgeon passes a resectoscope through the tip of the penis and up the urethra to reach the prostate. A resectoscope is a type of endoscope that uses a magnifying instrument with a light and video camera. The surgeon passes tools through the resectoscope and uses a thin wire with an electric current or a laser to cut away and remove prostate tissue around the urethra.

TURP is sometimes used to help relieve urinary (peeing) problems caused by an enlarged prostate blocking the urethra. This is done as palliative treatment for those with advanced prostate cancer or those who are not healthy enough for a radical prostatectomy. It is not a cure for prostate cancer.

Radiation therapy

Radiation therapy uses high-energy rays to stop cancer cells from growing and dividing. It is usually used to treat prostate cancer. Your healthcare team will consider your personal needs to plan the type and amount of radiation, and when and how it is given.

You may be offered radiation therapy as a treatment if you are older or not healthy enough to have surgery. You may also be given hormone therapy together with radiation therapy.

It is difficult to remove the prostate with surgery after radiation therapy because radiation therapy causes scar tissue in the area.

The following types of radiation therapy are used to treat prostate cancer.

External radiation therapy

During external radiation therapy, a machine directs radiation through the body to the prostate and the area requiring treatment. This may include the lymph nodes in the pelvis. Doctors give radiation to the smallest area possible to help reduce the risk of side effects.

There are different ways of giving external radiation that target the area being treated while limiting the amount of radiation to the surrounding normal tissues.

Brachytherapy

Brachytherapy is internal radiation therapy. Internal radiation therapy places radioactive materials in the body. Larger doses of radiation can be given with internal radiation therapy than with external radiation therapy. Brachytherapy uses an implant that contains a radioactive material called a radioactive isotope. The implant is placed right into the tumour or very close to it. This type of brachytherapy is called interstitial brachytherapy. The radiation kills the cancer cells over time by destroying their ability to divide.



Low-dose-rate (LDR) brachytherapy for prostate cancer uses a permanent implant to deliver continuous low doses of radiation over 6 months. Special safety precautions are taken to make sure other people aren't exposed to the radiation.

You may be offered LDR brachytherapy for prostate cancer that has not spread outside of the prostate. It may be used by itself for tumours that are intermediate (Grade Group 2 or 3) or combined with external radiation therapy or hormone therapy for tumours that are more aggressive or advanced.

High-dose-rate (HDR) brachytherapy for prostate cancer uses a temporary implant to deliver a high dose of radiation. No radiation stays in the body after the treatment has been delivered. A single treatment usually takes 15 to 20 minutes and is given while you are under an anesthetic. Like LDR brachytherapy, HDR brachytherapy can be used alone or combined with hormone therapy or external radiation therapy.

Systemic radiation therapy

Systemic radiation therapy is another type of internal radiation therapy. It may also be called radioisotope therapy. In systemic radiation therapy, a radioactive material travels through the body. Cancer cells take up the radioactive material, which kills them.

For prostate cancer, radiation therapy may be given by attaching a radioactive material to a substance that targets specific molecules (such as proteins) on the surface of cancer cells. This allows the radiation to be delivered directly to the cancer cells, which may cause fewer or less severe side effects.

Systemic radiation therapy is used most often as palliative care for castration-resistant prostate cancer (prostate cancer that has come back or didn't go away after hormone therapy) and for prostate cancer that has spread to bones and is causing pain.

Hormone therapy

Hormone therapy is often used to treat prostate cancer. It works by temporarily shutting down the body's production of androgens (male hormones).

Androgens, such as testosterone, help prostate cancer cells grow. They also control the development of male physical traits, such as a deep voice and the growth of hair on the body and face. Androgens are made mainly by the testicles.

Drugs can be used to block the production or effects of androgens like testosterone. Hormone therapy alone can't cure prostate cancer, but it can shrink tumours, slow the growth of cancer cells and help you live longer. It is often used together with radiation therapy.

You may be offered hormone therapy if the cancer has spread outside of the prostate, or if prostate cancer has come back after other treatments. You may also be offered hormone therapy if there is a high risk of the cancer coming back after you've had surgery or radiation therapy.

Your healthcare team will consider your personal needs to plan your hormone therapy. You may start hormone therapy soon after you are diagnosed. Or you may not start treatment until the symptoms of prostate cancer get worse. You may start and stop hormone therapy (called intermittent hormone therapy) or you may take it continuously for a long time. Sometimes 2 types of hormone therapy are used together (called an androgen blockade).

Hormone therapy can stop working over time, leading prostate cancer to begin growing again. When this happens, doctors may offer other hormone therapies or other treatments. They can't predict how long hormone therapy will work, so you will have regular blood tests to check your PSA and testosterone levels. If the PSA level starts to rise and the testosterone level is low, it may mean that the cancer has started to grow again.

Different types of hormone therapy are used to treat prostate cancer.

Luteinizing hormone–releasing hormone (LHRH) agonists are drugs that stop the testicles from making testosterone. LHRH agonists are also called LHRH analogs or gonadotropin-releasing hormone (GnRH) agonists.

The most common LHRH agonists used to treat prostate cancer are leuprolide (Lupron, Lupron Depot, Eligard), goserelin (Zoladex) and triptorelin (Trelstar).

LHRH antagonists (also called GnRH antagonists) are drugs that stop the pituitary gland from making LH. This causes the testicles to stop making testosterone. LHRH antagonists usually lower testosterone levels more quickly than LHRH agonists.

The LHRH antagonist used to treat prostate cancer is degarelix (Firmagon).



Androgen synthesis inhibitors block enzymes that the body needs to make testosterone.

Androgen synthesis inhibitors include abiraterone (Zytiga). They may be used to treat advanced prostate cancer.

Anti-androgens block testosterone. They attach to androgen receptors on prostate cancer cells and prevent testosterone from entering the cell.

Anti-androgen drugs usually aren't given alone to treat prostate cancer. They may be used along with an LHRH agonist (called combined androgen blockade, or CAB) or an orchiectomy as the main treatment for prostate cancer. Anti-androgens can also be given if the cancer starts to grow after an orchiectomy or while you are taking an LHRH agonist or LHRH antagonist.

The anti-androgens that are most commonly used to treat prostate cancer are:

- bicalutamide (Casodex)
- flutamide
- nilutamide (Anandron)
- apalutamide (Erleada)
- enzalutamide (Xtandi)
- darolutamide (Nubeqa)

An *orchiectomy* (also called surgical castration) is surgery to remove the testicles. Removing the testicles reduces the amount of testosterone in the body. An orchiectomy is not commonly used to treat prostate cancer anymore.

Chemotherapy

Chemotherapy uses anti-cancer (cytotoxic) drugs to destroy cancer cells. It is given to help you live longer and try to improve your quality of life by relieving pain and controlling symptoms.

Chemotherapy is sometimes used to treat prostate cancer that has spread to other parts of the body (called metastatic prostate cancer) or that has stopped responding to hormone therapy.

Chemotherapy drugs used to treat prostate cancer are docetaxel, mitoxantrone and cabazitaxel (Jevtana).

You will continue to take hormone therapy while you are having chemotherapy.

Targeted therapy

Targeted therapy uses drugs to target the specific molecules (such as proteins) on cancer cells or inside them that tell cells to grow or divide. Targeted therapy drugs stop the growth and spread of cancer cells and limit harm to normal cells.

You may have targeted therapy to treat castration-resistant prostate cancer that has certain changes to the genes in the cancer cells. The targeted therapy drug used is olaparib (Lynparza).

Treatments for prostate cancer by stage

Different treatments are offered for different stages of prostate cancer, depending on your overall health.

Stage	Potential treatments offered
localized, low and very low risk	• active surveillance • watchful waiting • surgery (radical prostatectomy) • radiation therapy (external, brachytherapy)
localized, favourable intermediate risk	• active surveillance • watchful waiting • surgery (radical prostatectomy) • radiation therapy (external, brachytherapy)
localized, unfavourable intermediate risk	• surgery (radical prostatectomy) • radiation therapy (external, brachytherapy) with or without hormone therapy • hormone therapy • watchful waiting
localized, high and very high risk	• radiation therapy (external, brachytherapy) with hormone therapy • surgery (radical prostatectomy) • watchful waiting
locally advanced	• radiation therapy (external, brachytherapy) with hormone therapy • surgery (radical prostatectomy, TURP) and radiation therapy with or without hormone therapy • hormone therapy alone • watchful waiting
castration-sensitive (cancer that responds to hormone therapy), metastatic	• hormone therapy • radiation therapy (external) • surgery (TURP) • chemotherapy • treatments for bone metastases • watchful waiting

Stage	Potential treatments offered
recurrent – after a radical prostatectomy	• radiation therapy (external, brachytherapy) with or without hormone therapy • hormone therapy • watchful waiting
recurrent – after radiation therapy	• watchful waiting • brachytherapy • cryosurgery • hormone therapy
recurrent – outside of the prostate	• hormone therapy • chemotherapy • targeted therapy • treatments for bone metastases
castration-resistant (cancer that no longer responds to hormone therapy), non-metastatic	• hormone therapy with additions or changes to the medicines
castration-resistant, metastatic	• hormone therapy with additions or changes to the medicines • chemotherapy • targeted therapy • radiation therapy (external, systemic) • treatments for bone metastases



Clinical trials

Clinical trials are research studies that look at new ways to prevent, find, treat or manage cancer. They help determine whether new treatments, drugs or devices are effective and safe.

When you join a clinical trial, you have the chance to receive a new and promising treatment. This can bring hope if other treatment options do not work or are not available.

Clinical trials are something you volunteer to do, not something you have to do. Learn all that you can before you decide to take part.

To learn more about clinical trials, visit cancer.ca. You can also visit:

- ClinicalTrials.gov
- CanadianCancerTrials.ca
- cancer.gov/ClinicalTrials (US National Cancer Institute)

If you can't have or don't want cancer treatment

You may want to consider a type of care to make you feel better without treating the cancer itself. This may be because the cancer treatments don't work anymore, they're not likely to improve your condition or they may cause side effects that are hard to cope with. There may also be other reasons why you can't have or don't want cancer treatment.

Talk to your healthcare team. They can help you choose care and treatment for advanced cancer.

Questions to ask about treatment

- What are the risks if the cancer is not treated soon?

- What treatment plan has the healthcare team recommended for me?

- When will my treatment begin and how long will it last?

- How will I be monitored if active surveillance is my treatment?

- What symptoms should I report to the healthcare team if watchful waiting is my treatment?

- What if the first line of treatment doesn't work?

Part 4: Side effects

Side effects can happen with any type of treatment for prostate cancer, but everyone's experience is different. Some people have many side effects. Other people have few or none at all.

If you develop side effects, they can happen any time during, immediately after or a few days or weeks after treatment. Sometimes late side effects develop months or years after treatment. Most side effects go away on their own or can be treated, but some side effects may last a long time or become permanent.

Understanding the side effects may be part of your decision about which treatment for prostate cancer you choose, especially if you have been given a choice between surgery or radiation therapy. Talk to your healthcare team about the side effects of each treatment. They can help you make the treatment decision that's right for you.

Side effects of prostate cancer treatment

Sometimes it helps to compare side effects when you are making decisions about treatment. The following table lists the possible side effects of each treatment side by side.

	Treatment	
	Surgery	**Hormone therapy**
Side effects	• bleeding • infection • problems with getting and keeping an erection (called erectile dysfunction) • changes in orgasm • loss of bladder control (called urinary incontinence) • leakage of stool (poop) from the anus • leakage of urine during ejaculation • a weakened area of the abdominal wall near the groin, where the intestines can poke through (called an inguinal hernia) • swelling in the genital area • loss of fertility • swelling (lymphedema) • shortening of the penis	• low sex drive • erectile dysfunction • hot flashes • mood swings • breast tenderness and growth of breast tissue • shrinkage of the testicles and penis • loss of muscle and physical strength • bone thinning and fractures (breaks) • fatigue • diarrhea or constipation • high blood pressure • headache • nausea • depression, trouble concentrating and memory problems • increased cholesterol • heart problems

	Treatment		
	Radiation therapy	**Chemotherapy**	**Targeted therapy**
Side effects	• fatigue • diarrhea • blood in the stool • rectal pain • rectal burning • leaking from the anus • urinary incontinence • more frequent urination • burning with urination • erectile dysfunction • lymphedema • pain and swelling between the scrotum and rectum • blood in the urine • a temporary increase in PSA level (called a PSA bounce)	• low blood cell counts • nausea and vomiting • diarrhea • fatigue • hair loss • sore mouth and throat • loss of appetite	• low red blood cell counts • joint aches • ankle swelling • bladder infections • cough • breathing problems • nausea and vomiting • diarrhea

Managing side effects

Most treatments for prostate cancer can cause both short-term and long-term side effects. The following are the most common side effects of treatment for prostate cancer. Talk to your healthcare team about how they may be managed or treated.

Fatigue
Fatigue causes a person to feel more tired than usual and can interfere with daily activities and sleep. It is a common side effect of treatment for prostate cancer.

Fatigue can be caused by a low red blood cell count (called anemia) or the toxic substances that are made when cancer cells break down and die because of radiation therapy. It can also be caused by poor appetite and depression. You can also have fatigue as you recover from prostate cancer surgery.

Fatigue may get better as time goes by, or it may continue long after you have finished treatment for prostate cancer.

Tell your healthcare team if fatigue is bothering you. They can look to find out what is causing your fatigue and suggest ways to treat or manage it.

Urinary incontinence
Any treatment that removes the prostate or destroys prostate tissue can affect urination. This is because the prostate is close to the bladder and it surrounds the urethra.

Urinary incontinence is also called loss of bladder control. It is an involuntary loss of urine or the inability to control urination. It's a relatively common side effect of a radical prostatectomy. Incontinence is usually temporary, lasting a few weeks to a few months, but in some cases it may be permanent. Leakage of urine may occur without warning, or only with heavy lifting or sudden physical movement such as sneezing or laughing. Radiation therapy can cause other urinary side effects including frequent urination, burning and pain, blood in the urine or an intense urge to urinate.

Controlling the amount and types of fluid and food you eat and drink can help you manage urinary incontinence. Avoid alcohol and caffeinated drinks because they can overstimulate the bladder. Spicy foods, carbonated drinks and citrus fruits and juices can irritate the bladder, so limit how much of these you eat or drink. Don't drink too many fluids 3 to 4 hours before you go to bed. If you have overweight or obesity, losing weight can also help improve incontinence.

Talk to your healthcare team about other ways to manage urinary incontinence. They may suggest trying one or more of the following.

Bladder training and exercises
Try to schedule regular trips to the toilet every 2 to 3 hours when you're awake, and slowly increase this over time to every 3 to 4 hours.

Talk to your healthcare team about learning to do Kegel exercises. These exercises strengthen the pelvic floor muscles that help you control urination. Making these muscles stronger can lessen urinary incontinence.

Medicines
Your healthcare team may suggest medicines to treat urinary incontinence. These drugs work in different ways to relax or strengthen the bladder muscle, stop bladder spasms and help slow the contractions of the bladder. Other medicines can be used to help with emptying the bladder.

Medical devices
Your healthcare team may suggest different medical devices to help manage urinary incontinence. These may include a tube (catheter) inserted into the bladder to drain the urine or a condom over the penis, attached to a tube that drains urine into a bag.

Surgery
If other methods don't help improve urinary incontinence, your healthcare team may suggest surgery to help. There are different surgeries that may be used to treat urinary incontinence, depending on what is causing it.

Sexual side effects

Sexual side effects of prostate cancer treatment may include infertility, loss of sex drive (libido) and erectile dysfunction.

Whether you're single or in a relationship, changes in sexual intimacy are common during and after prostate cancer treatment.

You can continue to have strong, supportive relationships and a satisfying sex life after prostate cancer. If sexual problems happen because of prostate cancer or its treatments, there are ways to manage them.

You might need help dealing with sexual concerns or problems. Health professionals who specialize in sexual problems can provide information and support to people with cancer and their partners. Sexual counselling can be done on a one-to-one basis, with a partner or in a group. Counselling can help you talk openly about your problems, work through your concerns and discover new ways of coping or finding sexual pleasure.

Talk to your healthcare team about resources that can help you cope with sexual concerns or problems.

Infertility

Infertility can be a side effect for those who have surgery or radiation therapy to treat prostate cancer.

A radical prostatectomy removes the prostate and seminal vesicles, which make most of the fluid in semen. This causes a dry orgasm, which means that you reach sexual climax but don't ejaculate semen.

Radiation therapy can lower sperm counts or destroy sperm cells or stop sperm from being made in the testicles.

Most men with prostate cancer are older when they are diagnosed, so not being able to get someone pregnant is often not an issue. Be sure to talk to your healthcare team if you have concerns about how treatment may affect your fertility. You can also talk to your healthcare team about having your semen (containing sperm) frozen.

Loss of sex drive

Loss of sex drive is also called decreased libido. It is common to have less interest in sex when you are diagnosed with cancer and during treatment. Hormone therapy in particular can lower your sex drive because it lowers testosterone levels. Your sex drive can be low after treatment because you may worry that it will be painful or that you won't be able to get an erection or have an orgasm.

Erectile dysfunction (ED)

Erectile dysfunction (ED) is the inability to get and keep an erection firm enough to have sex. It's also called impotence.

ED is a common side effect of a radical prostatectomy, even when the surgeon spares the nerve bundles that control erections. Some men may have an improvement in their erections over time, while others may never recover the ability to get a spontaneous erection.

Radiation therapy can also cause ED, but it happens slowly over a period of time after treatment has finished.

The following are some of the treatments available for ED. Talk to your healthcare team about potential treatments and which would work best for you.

Medical treatments for erectile dysfunction			
Treatment	**Description**	**Advantages**	**Disadvantages**
oral medicines	PDE5 inhibitors relax the blood vessels and increase blood flow in the penis.	• easy to take • can help with spontaneous sex	• won't work if erection nerves were removed • can't be taken with nitrate medicines (used for heart pain) • cost
penile injections	A medicine is injected with a very fine needle into the spongy tissues of the penis.	• can work even if erection nerves are damaged • can be used if you can't take oral medicines	• discomfort • risk of a prolonged erection • causes scar tissue that can bend the penis • fainting (rare side effect)
medicated urethral system for erection (MUSE)	A small pellet of medicine is injected into the urethra with a special device.	• can work even if erection nerves are damaged • no needle • can be used if you can't take oral medicines	• discomfort • cost

Medical treatments for erectile dysfunction			
Treatment	**Description**	**Advantages**	**Disadvantages**
vacuum constrictive devices	A plastic tube fits around the penis, and a vacuum draws blood into the penis to create an erection.	• do not require medicines or surgery • no needle	• can cause bruising • penis may feel cool to the touch, so it doesn't feel natural • can't be left on longer than 30 minutes • can't use if you are on blood thinner medicines
penile prostheses	Rods or cylinders are placed in the penis. Firm rods can be bent into different positions for sex or for covering with clothing. Inflatable implants allow water to be pumped into the cylinder to create an erection.	• can use if you can't take oral medicines • avoids the risks of scar tissue from penile injections • no change to the feel of the penis skin	• need to have surgery to have the implant placed in the penis • may be embarrassing if with a new partner • if implant fails surgery is needed to remove it

Bowel side effects

Radical prostatectomy surgery has a very small risk of injury to the rectum. A temporary colostomy (an opening in the abdomen for bowel movements to come through into a bag) may be necessary. This is usually a short-term measure until the rectal injury site is healed.

Talk to your healthcare team if you have bowel problems. They can suggest changes to your diet or prescribe medicines that can help.

Loss of bone mass

A loss of bone mass is called osteoporosis. Some hormone therapies for prostate cancer can increase the risk for osteoporosis. These therapies lower the amount of testosterone in the body so cancer cells can't use it to grow. But testosterone also plays a role in maintaining strong bones, so hormone therapies that lower testosterone levels can cause bone loss. Cancer that has spread to the bones can also lead to bone weakness and fractures (breaks).

Finding and treating osteoporosis early can help prevent bone loss and bone fractures. Treatment for osteoporosis includes drugs called bisphosphonates and denosumab. It is important to also take calcium and vitamin D.

Hormone therapy can also cause a loss of muscle mass and strength. Regular exercise can help slow or prevent this. Talk to your healthcare team about the best types of exercise to help with osteoporosis and loss of muscle mass.

Questions to ask about side effects

- What are the major side effects of the recommended treatments?

- How will my quality of life be affected by each type of treatment?

- Am I likely to have problems with incontinence or erectile dysfunction after treatment?

Part 5: Follow-up

Follow-up care for prostate cancer

Once you've finished treatment for prostate cancer, you will still need to be monitored closely by your healthcare team.

Your follow-up plan may include regular appointments and exams, lab tests or imaging tests. Tell your healthcare team about any new symptoms, such as bone pain or problems with urination. This gives your team a better chance of finding the cancer early if it comes back (recurs).

Fear of the cancer coming back
If you are treated for prostate cancer, you may worry that it will come back. Learning how to deal with these fears can help you maintain a good quality of life.

If you find that you're worried and anxious all the time, or if your anxiety is interfering with your daily life, you may want to talk to a counsellor. It is important to get worries under control so you can focus on living, take care of your health and make the most of each day.

Healthy lifestyle
Avoiding tobacco, eating well, getting enough physical activity, maintaining a healthy weight and limiting alcohol may help you live longer and lower your risk of prostate cancer coming back or of developing a second cancer. Your healthcare team can help you make plans for staying healthy.

Physical activity
You may notice that you've lost muscle mass and your overall fitness has declined during and after treatment for prostate cancer. You may also have fatigue.



Becoming active again is an important step to regaining your health. Regular physical activity has been shown to help with side effects like fatigue, pain and anxiety. It can improve your energy levels and help you sleep better. Physical activity can help increase your muscle mass and strength, improve your heart health and lower your blood pressure. It also plays an important role in getting to and keeping a healthy body weight.

Try to build up to at least 30 minutes of activity every day. If you can't do that, some activity is better than none. It can take time to discover what you're capable of and to get used to changes in how your body works. You may have to accept that your body has new limits during or after treatment – when getting started, you may not be able to move very far or very fast. You may be quite tired, especially at first.

Talk to your healthcare team before getting started. They can let you know what type of activity is safe for you and how quickly you can increase your activity level. Gentler forms of exercise such as brief, slow walks, stretching and swimming are almost always OK to start with. But if you're planning to get back to something vigorous (such as heavy gardening, lifting weights or playing a contact sport), your healthcare team needs to know.

Eating well

Eating a healthy, well-balanced diet that includes a variety of food groups can help you recover from prostate cancer. Eating well can also help you live longer and may help lower your risk of developing a second cancer.

While recovering from prostate cancer, try to:

- eat a diet high in vegetables, fruit and whole grains
- limit high-calorie foods and drinks
- eat a diet low in saturated fat

If you received hormone therapy or radiation therapy to treat prostate cancer, be sure to talk to your doctor or a dietitian about the best nutrition for you. Research shows that getting enough vitamin D and calcium can help prevent osteoporosis and bone fractures in those having hormone therapy. Some people who receive radiation therapy have problems properly absorbing nutrients from food.

Emotional and mental wellness

A prostate cancer diagnosis can change your life. Stress, anxiety, fear and many other emotions are common. Having a strong support network is important to ensure you get through this difficult time in a positive way. Your support network can include friends, support groups, church and spiritual groups. It can also include members of your healthcare team, such as your family doctor, oncologist, social worker, psychologist and sex therapist.

You may want to try some of these different coping strategies to see what works for you.

Recognize and be honest about your feelings. Try to describe or talk about them. It may be hard to tell your family and friends how you really feel because you want to protect them. But being honest can help improve communication and strengthen your relationships with those you care about.

Talk to someone. Finding the courage to talk to just one person can be the first step to feeling better. It could be a friend, a relative or a mental health professional. It may also help to talk to someone who has had a similar cancer experience.

Be honest and clear with the people who are supporting you. Make a list of how each person can help you during this time (for example, drive you to appointments, help with chores, listen when you need someone to talk to).

Keep your life as normal as possible. Even though a cancer diagnosis can upset many things in your life, try to carry on with your normal routine and habits as much as you can. Get up and dressed every day. Keep your social life active.

Decide what's important to you. Stay involved in activities that you enjoy and have meaning for you. You can manage your time by making a realistic list of things to do each day.



Try meditation, yoga or relaxation techniques. These practices can help lessen stress, anxiety or anger, allowing you to feel calmer and more in control of what's happening in your life.

Seek out the positive. Spend time with people who make you laugh or do something that makes you feel good. Many people find that spending time with pets helps them feel calm and more positive.

Change your surroundings. Take a break or a walk and give yourself some quiet time. Spend some time at a place that you find calming, like a beach or park.

Join a support group. It sometimes helps to talk to others who have gone through or are currently going through a similar experience.

Reach out if you need more help. Tell your healthcare team if you are still having problems coping with your emotions. They may refer you to a specialist such as a psychologist or psychiatrist for medicine or therapy to treat depression or anxiety.

Questions to ask about follow-up

- What is the schedule for follow-up visits?

- What tests are done on a regular basis? How often are they done?

Notes

WE'RE HERE TO HELP



Find information you can trust
Visit cancer.ca for information on more than 100 cancer types. You'll find topics ranging from diagnosis and treatment to managing side effects, living with cancer and reducing your risk. We also have publications, videos and webinars.



Get answers to your questions
When you have questions about diagnosis, treatment, prevention, emotional support and other services, our trained cancer information specialists can help you find answers. Call us at 1-888-939-3333. Our Cancer Information Helpline is available in English and French with an interpreter service for other languages.



Connect with someone who's been there
Visit CancerConnection.ca to join our moderated online community. You can join discussion groups, get support and help others at the same time. It's a safe place to connect, learn and share your experience with cancer.



Find services in your community
Our Community Services Locator (CSL) helps you find the cancer-related services you need. You can search over 4,500 listings across Canada for emotional support programs, home care, help getting to your cancer treatment, where to find a wig or prosthesis and much more. Start your search at cancer.ca/csl.

The Canadian Cancer Society works tirelessly to save and improve lives. We raise funds to fuel the brightest minds in cancer research. We provide a compassionate support system for all those affected by cancer, across Canada and for all types of cancer. Together with patients, supporters, donors and volunteers, we work to create a healthier future for everyone.

Because to take on cancer, it takes all of us.
It takes a society.

Canadian Cancer Society

IT TAKES A SOCIETY

1-888-939-3333
CANCER.CA

This is general information developed by the Canadian Cancer Society. It is not intended to replace the advice of a qualified healthcare provider.

The material in this publication may be copied or reproduced without permission. However, the following citation must be used: *Prostate Cancer: From diagnosis to follow-up*. Canadian Cancer Society 2023.

© Canadian Cancer Society 2023 · 32429-1-NO