

100

THINGS  
TO KNOW  
WHEN  
DIAGNOSED  
WITH

PROSTATE

CANCER

Not actual patient.

A blue and orange speech bubble containing the text 'Q&A'.

## Q&A

### Where is the prostate gland located?

The **prostate gland** is part of the **male reproductive system**. It is about the size of a walnut. The gland is located in front of the rectum and **below the urinary bladder**. It surrounds the urethra – the tube that carries urine from the bladder to the penis.<sup>1</sup>

### What is the function of the prostate gland?

The prostate gland **produces seminal fluid** – a component of semen. This fluid is called semen, and it protects and **nourishes sperm**. The prostate's muscles help the semen travel to the urethra to assist with ejaculation.<sup>1</sup>



### What is cancer?

Cancer occurs when the **natural process of cell division** and multiplication is **altered**. Cells affected by cancer grow out of control and much faster than normal cells. As cancer cells **grow out of control**, they **overtake normal cells** and **hamper the normal functioning** of the organ in which cancer develops. Cancer cells can also spread from the organ of their origin to another organ.<sup>2</sup>



### What is prostate cancer?

**Prostate cancer** occurs when cells in the **prostate gland** grow **uncontrollably**. In general, cancer is the result of an abnormality in normal cell function, causing some cells to grow differently than normal cells.<sup>3</sup>

### Does an enlarged prostate always indicate the presence of cancer?

No, an enlarged prostate can be caused by **other conditions such as BPH** (benign prostatic hyperplasia). BPH is more common than prostate cancer, although some risk factors and symptoms might be common between BPH & prostate cancer, **they are different conditions** with different treatment approaches.<sup>3</sup>

### How common is prostate cancer?

Prostate cancer is the **second most common cancer** in American men, after skin cancer. In 2023, an estimated 288,300 new cases were diagnosed in the U.S with about 34,700 deaths, according to the estimates by ACS (American Cancer Society). While it is a common diagnosis, **many men live long and healthy lives with early detection and proper treatment.**<sup>4</sup>

### What is the risk of getting prostate cancer?

About 1 in 8 men will be diagnosed with prostate cancer during their lifetime. However, each man's risk varies, depending on their individual risk factors.<sup>4</sup>

### What are the risk factors for prostate cancer?

The main risk factors for prostate cancer include **older age, Black race, and family history**. Beyond these, there are other factors which may be linked with prostate cancer, although their effects are less clear. These include **obesity, smoking, dietary factors and exposure to toxins.**<sup>5</sup>



### How deadly is prostate cancer?

After lung cancer, prostate cancer is the second leading cause of death in American men. Approximately **1 in 41** men will die from prostate cancer. However, **survival rates** have improved due to **early detection and advances in treatment options**.<sup>4</sup>

### What are prostate cancer risk groups?

Prostate cancer is classified into risk groups based on the results of testing. The categories include very low risk, low risk, favorable intermediate risk, unfavorable intermediate risk, high risk, or very high risk.<sup>3</sup>

### How is prostate cancer classified?

The American Joint Committee on Cancer (**AJCC**) groups cancers **into stages** (Stage 1, Stage 2, Stage 3 and Stage 4). However, the **SEER** database classifies cancers based on **localized, regional, and distant stages**.

- **Localized:** There is **no sign** that the cancer has **spread outside the prostate**.
- **Regional:** The cancer **has spread outside the prostate** to nearby organ locations such as the lymph nodes.
- **Distant:** The cancer **has spread to other parts of the body**, such as lungs, liver, or bones.<sup>6</sup>

### How is the stage of prostate cancer determined?

A staging system is used **to denote** how much the **cancer has spread in the body**. The staging system used for prostate cancer is the TNM staging system, in which

- T denotes the extent of the main (primary) **tumor**.
- N denotes whether the cancer has spread to nearby lymph **nodes**.
- M denotes whether the cancer has spread (**metastasized**) to other parts of the body.

PSA levels and grade groups are also used to classify prostate cancer into stages from I to IV (I, IIA, IIB, IIC, IIIA, IIIB, IIIC, IVA or IVB).<sup>7</sup>



### What is the difference between early stage and advanced stage prostate cancer?

If the cancer has not spread beyond the prostate it is called early-stage prostate cancer. In advanced-stage, the cancer spreads to other parts of the body (metastatic).<sup>3</sup>

### What is Gleason score?

The prostate contains more than one pattern of cells. A cancer cell pattern that resembles **normal**, healthy cells is assigned a **lower number**, whereas a pattern that appears more **abnormal** receives a **higher number**. Therefore, to estimate the risk, two of the most frequent patterns are combined to give a single score. The cancer cell pattern that occupies the **largest portion** of the sample is given the **first number**, while the pattern covering the **second largest area** is assigned the **second number**. It ranges from 6 to 10 (6 being the lowest). For example: Pattern 5 + Pattern 3 = Gleason score 8.<sup>3</sup>

### What are grade groups of prostate cancer?

Gleason score ranges from 6 to 10 where **6 is the lowest score**. Since the Gleason score may be confusing to understand, calculated values of Gleason scores are simplified to denote specific grade groups of prostate cancer. Grade groups are numbered from 1 to 5. **Grade 1** indicates **low risk** prostate cancer. A Gleason score of 6 will fall under this grade. Grades 2 & 3 represent intermediate risk & Grades **4 & 5 represent high risk** prostate cancer.<sup>3</sup>

### What are 5-year survival rates for prostate cancer?

According to the ACS, the overall 5-year survival rate for prostate cancer is **97% in the U.S.** For localized or regional stages of prostate cancer, the survival rate is greater than 99%. For **distant stage** prostate cancer, the **5-year survival rate drops to 37%**. These figures are based on the data captured for prostate cancer cases diagnosed between 2014 and 2020.<sup>6</sup>



### In which age group is prostate cancer generally detected?

Prostate cancer is more likely to develop in **older men and in non-Hispanic Black men**. About 6 cases in 10 are diagnosed in men who are 65 or older, and it is rare in men under 40. The average age of men when they are first diagnosed is approximately 66 years of age.<sup>4</sup>



### What are the symptoms of an enlarged prostate related to cancer?

Symptoms of prostate cancer **depend on the stage of the cancer**. In the **early stages**, patients may **not have any symptoms** or they may have symptoms such as **burning** or pain while urinating or **blood in urine or semen**.<sup>3</sup>

### Are diet and lifestyle associated with an increased risk of prostate cancer?

**No specific diet** is linked with prevention or causation of prostate cancer. However, high-fat foods including some meats and dairy products have been associated with an increased risk of prostate cancer. **Exercise** and weight loss may reduce the risk of prostate cancer.<sup>5</sup>



### Are there any genes which are linked to prostate cancer?

About 10% of prostate cancer cases can be **linked to inherited gene changes**. Genes such as *BRCA1*, *BRCA2*, *ATM*, and *PALB2* can increase the risk. Your physician can suggest genetic testing to assess your risk and select appropriate treatment.<sup>8</sup>



### Can prostate cancer be prevented?

There is **no guaranteed** way to prevent prostate cancer. Many risk factors, such as age, race, and family history cannot be controlled. However, a healthy diet, **regular physical activity** and **certain medications or supplements** may be associated with a lower risk.<sup>9</sup>



### Why are various tests done for prostate cancer?

Various tests are done to find or **detect prostate cancer, or to assess the spread of prostate cancer**. Tests may be done **prior to treatment** to assess the appropriate treatment option. During treatment, tests can be done to evaluate the response to treatment and side effects. Tests after completion of treatment are completed at certain intervals to assess for any recurrence.<sup>3</sup>



### Who should get screened for prostate cancer?

ACS recommends that men should discuss prostate screening with their doctor. The discussion about screening should generally take place at:

- Age 50 for men who are at average risk of prostate cancer and are expected to live at least 10 more years.
- Age 45 for men at high risk of developing prostate cancer. This includes Black men and men who have a first-degree relative (father or brother) diagnosed with prostate cancer at an early age (younger than age 65).
- Age 40 for men at higher risk (those with more than one first-degree relative who had prostate cancer at an early age).

Decisions about screening should be based on overall health and other factors, not age alone.<sup>9</sup>

### What screening methods are available for prostate cancer?

Prostate cancer screening includes a **blood test** to detect levels of **prostate-specific antigen** (PSA). Digital rectal examination (DRE) and other tests may also be done.<sup>3</sup>

### What is the PSA test?

PSA is a protein made by prostate gland cells. PSA levels are checked through a test done using blood samples and can be used as a screening test for prostate cancer. There is a standard cut-off for PSA levels in blood which can assist in the diagnosis of prostate cancer. Most men without prostate cancer have PSA levels below 4 nanograms per milliliter (ng/mL). When **prostate cancer** develops, these **levels often increase**. PSA levels greater than **10 ng/mL** indicate a **50% chance** of developing prostate cancer. Levels between 4 to 10 ng/mL are considered borderline.<sup>10</sup>



### What is DRE?

Digital Rectal Examination or DRE is a **medical procedure done to evaluate the prostate gland**. The doctor will insert a gloved, lubricated finger into the rectum to assess the prostate gland. Any uneven areas, bumps or hard surfaces on the prostate might be suggestive of cancer.<sup>10</sup>

### What if PSA or DRE test are abnormal?

Both PSA and DRE are screening tests for prostate cancer. If one or both these tests are abnormal, your healthcare provider may plan on appropriate follow-up. This can include **repeating the same tests**, or doing other tests, including **imaging tests** or getting a **prostate biopsy**.<sup>10</sup>

### What is PSA persistence and PSA recurrence?

When a patient with localized prostate cancer undergoes initial treatment (surgery with / without radiation therapy), PSA levels should become undetectable. However, in some cases, **PSA levels do not fall** to low enough levels. This is called **PSA persistence**. In some cases, the PSA levels fall to **near zero** but **begin to rise again**. This is called **PSA recurrence**.<sup>3</sup>

### How are the cases of PSA persistence or PSA recurrence managed?

If PSA persistence or PSA recurrence occurs, other **tests such as imaging and biopsy may be required** to make decisions about **further treatment**. The rate at which PSA rises is also considered. The treatment plan is based on factors such as the initial treatment received, extent of spread of cancer, life expectancy and the general health of the patient.<sup>3</sup>

### What is prostate biopsy?

A biopsy is a procedure wherein **small samples of the tissue**, in this case prostate tissue, are **removed and examined microscopically**. Using imaging, prostate tissue samples are obtained and sent to a laboratory. The results of these tests can guide the diagnosis of prostate cancer.<sup>3</sup>

### What other tests may be done for prostate cancer?

Besides the tests already mentioned, additional tests can include imaging tests [such as transrectal ultrasound (TRUS), magnetic resonance imaging (MRI), positron emission tomography (PET) scan, computed tomography (CT) scan, bone scan], lymph node biopsy, testing for genetic mutations, or other tests as deemed necessary by the healthcare provider.<sup>11</sup>

### What genetic testing may be helpful in prostate cancer?

A genetic test is done to **detect any alterations or abnormalities in your genes**. There are two main types of genetic testing in prostate cancer: germline testing and molecular biomarker testing.<sup>3</sup>



### What is germline testing?

If there is a family history of prostate or other cancer, healthcare providers may suggest germline testing. Cancer can develop due to mutations in genes which are inherited from family members. Germline testing is done using samples of blood, urine, or saliva. A genetic counselor can help you decide if germline testing will be helpful for you.<sup>3</sup>

### What is molecular biomarker testing?

Molecular biomarker testing is done on a sample of prostate tissue obtained from a biopsy. The results from molecular **biomarker testing** can help your healthcare provider **assess the risk category of your prostate cancer and recommend a treatment plan**.<sup>3</sup>



### Who treats prostate cancer?

The doctors who manage prostate cancer can include **urologists** (doctors treating diseases of urinary system), **medical oncologists** (doctors treating cancer with medicine), **surgical oncologists** (doctors treating cancer with surgery), or **radiation oncologists** (doctors treating cancer with radiation therapy). Other healthcare team members have roles in the overall management of prostate cancer, such as nurse practitioners, nurses, pharmacists, nutritionists, counselors, physiotherapists and physician assistants.<sup>11</sup>

### What are the various management approaches for prostate cancer?

Prostate cancer management includes various approaches. Some approaches include no active treatment in the form of observation and active surveillance. Other approaches include **surgery, radiation therapy, hormone therapy, immunotherapy, and chemotherapy**. Participation in a clinical trial can also be another option.<sup>2</sup>

### How is the specific treatment plan for prostate cancer decided?

The treatment plan for prostate cancer is decided through shared decision making between the patient, the doctor and the healthcare team. The doctor will explain **available treatment options depending on patient-related factors** (such as age, family history, symptoms), and **disease-related factors** (such as grade, stage, extent of the disease, and other factors). The patient may express their preference after considering factors including quality of life and side effects.<sup>2</sup>

### Is a cure possible in prostate cancer?

Whether prostate cancer can be cured is dependent on multiple factors including the stage at which the cancer is detected. Patients diagnosed with **early-stage cancer are less likely to have a recurrence**. Patients are monitored during and after treatment of early prostate cancer, to assess for disease progression and recurrence. **Advanced stage prostate cancer is a lifelong disease**. Treatment is aimed at slowing growth, improving symptoms, and improving quality of life.<sup>3</sup>

### Do all diagnosed cases of prostate cancer need treatment?

No, not all cases of prostate cancer require immediate treatment because prostate cancer can be growing slowly. These slow-growing tumors may not require treatment. In these cases, a healthcare provider might recommend either observation or active surveillance.<sup>3</sup>

### What is observation for prostate cancer?

Observation is also called watchful waiting and includes monitoring of symptoms. If symptoms develop, treatment may only be for symptom improvement rather than more intense or curative options. Watchful waiting may be appropriate for patients who are elderly, frail, have significant health conditions or have shorter life expectancy. This strategy allows patients to maintain quality of life without unnecessary treatment burden.<sup>3</sup>



### What is active surveillance for prostate cancer?

Active surveillance is a more involved plan for monitoring the disease. During this period, tests such as PSA, DRE, biopsy, and other tests may be completed, and the development of symptoms will be considered. Treatment will likely begin if the cancer grows based on test results or if the patient develops symptoms. This strategy is often suitable for patients who have early-stage cancer.<sup>3</sup>

### What is the role of surgery in prostate cancer?

The goal of surgery is to remove the tumor as much as possible. Another option is surgical removal of the prostate. This procedure is called prostatectomy. Surgery may be the only treatment, or it can be part of an overall treatment plan.<sup>3</sup>



### What is radical prostatectomy?

A radical prostatectomy involves **removal of the entire prostate**, with some surrounding tissues and possibly nearby lymph nodes. Radical prostatectomy can be a **treatment option if the cancer is confined to the prostate**, the tumor is removable, and the patient has a longer life expectancy (greater than 10 years) without any significant health conditions.<sup>3</sup>



### What are the types of radical prostatectomy?

There are two main surgical procedures for radical prostatectomy – open surgery or minimally invasive surgery. **Open surgery involves an incision which allows the surgeon to directly view and remove the tumor. Minimally invasive surgery involves various smaller incisions instead of a larger cut** and various instruments or tools are used to remove the tumor and surrounding areas through these incisions. **Minimally invasive surgery is a preferred option as it involves less blood loss and fewer surgical complications.** This can allow for quicker recovery post-surgery and earlier discharge from the hospital.<sup>3</sup>

### What are the risks involved in prostatectomy?

The risks involved in prostatectomy are similar to other surgeries. The risks include complications from anesthesia, excessive bleeding during or after the surgery, injury to nearby organs, blood clots, and infection at the surgical site. Patient-specific factors play a role in incidence or severity of these risks.<sup>13</sup>

### What are the side effects of prostatectomy?

The main side effects after prostatectomy are **urinary incontinence and erectile dysfunction**. Urinary incontinence is a loss of control of urination. After surgery, a tube known as a catheter is placed in the urethra to help with healing and control of urination. The surgeon will decide when to remove the catheter. Other measures are available to help manage urinary incontinence. Erectile dysfunction is difficulty having an erection of the penis. Healthcare providers can suggest various interventions and counseling to manage these side effects.<sup>3</sup>

### What is cryotherapy?

Cryotherapy uses **very low temperatures to freeze and kill prostate cancer cells**. Long hollow needles are inserted into the prostate and very cold gases are pushed through needles to destroy cancer tissue or the entire prostate. It is also known as cryoablation.<sup>14</sup>

### What is the role of cryotherapy in prostate cancer?

Cryotherapy is not a standard treatment for newly diagnosed cases of prostate cancer. It can be used as a **secondary treatment for early prostate cancer** after surgery or radiation therapy. It is considered as an **option when surgery or radiation therapy are not feasible**. However, the long-term effectiveness of cryotherapy is still unknown.<sup>14</sup>

### What are the side effects of cryotherapy?

Side effects of cryotherapy can include localized pain, erectile dysfunction, urinary incontinence, pain or blood in urine or stool, and rarely a fistula (abnormal connection) between the bladder and rectum.<sup>14</sup>



### What is high-intensity focused ultrasound (HIFU) treatment?

In high-intensity focused ultrasound beams (HIFU) treatment, **an ultrasound probe is inserted through the rectum and used to create a 3-D image of the prostate**. This imaging together with other diagnostic imaging tests help a healthcare provider determine the areas of the prostate that require treatment. The probe is then used to create focused, high intensity ultrasound beams to precisely heat and destroy the identified areas of the prostate.<sup>14</sup>

### What is the role of HIFU in prostate cancer?

Like cryotherapy, HIFU is not a standard treatment for newly diagnosed cases of prostate cancer. It may be considered as an option after cancer recurs post-radiation therapy. The long-term effectiveness of HIFU is unknown.<sup>14</sup>



### What are the side effects of HIFU?

HIFU side effects include **localized pain, blood in urine, frequent urination and urinary tract infections**. Though less common, erectile dysfunction and urinary incontinence are also possible after HIFU.<sup>14</sup>



### What other types of ablative therapies are available for prostate cancer?

Other local ablative therapies can be used for patients with prostate cancer, including transurethral ultrasound ablation, focal laser ablation, and photodynamic therapy. Experts believe that these approaches need further long-term evaluation to assess the effectiveness.<sup>14</sup>

### What is transurethral resection of the prostate (TURP)?

TURP is used to treat prostate cancer symptoms, but is not used as a treatment of the cancer. It can relieve symptoms, such as difficulty in urination. During this surgery, an instrument is inserted into the urethra through the tip of the penis up to the level of the prostate. **Laser, electricity, or heat may be used to cut or vaporize surrounding prostate tissue.**<sup>13</sup>

### What is the role of radiation therapy in prostate cancer?

Radiation therapy uses high-energy radiation to kill or shrink cancer cells.<sup>15</sup>

### What are the types of radiation therapies used in prostate cancer?

Radiation therapies used in prostate cancer **include radiation from outside the body** (external beam radiation therapy), **radiation from inside the body** (brachytherapy) and **radiopharmaceuticals**. Radiotherapy is used alone or in combination with other interventions such as surgery as part of the overall treatment plan.<sup>3</sup>

### What is EBRT?

External beam radiation therapy (EBRT) **targets radiation directly on the cancer tissue. It avoids healthy tissue as much as possible**. Compared to the techniques used in the past, EBRT delivers higher doses of radiation more safely.<sup>3</sup>

### What are the types of EBRT?

Two types of EBRT are used in prostate cancer – photon radiation therapy and proton beam radiation therapy.<sup>3</sup>

### How is EBRT delivered?

Before EBRT, a radiation simulation is done to assess the best patient position to deliver radiation therapy. A treatment session is **similar to getting an x-ray, but the radiation delivered is much greater.** The machine may rotate to deliver radiation therapy from different angles. These sessions are painless. Each session can be an hour long, but **the radiation is only delivered for several minutes.** The sessions are typically repeated daily for several days or weeks.<sup>3</sup>

### What is photon radiation therapy?

Photon radiation therapy delivers high-energy x-rays to destroy cancer cells. It is widely available and commonly used.<sup>3</sup>

### What is proton beam radiation therapy?

Proton beam radiation therapy uses **streams of electronically charged protons (instead of x-rays) to target cancer tissue.** Machines used for proton beam radiation therapy are very expensive and are not widely available.<sup>3</sup>

### What is brachytherapy?

Brachytherapy is a type of **internal radiation.** Radioactive objects or **seeds are placed near the prostate** through a surgical procedure. It can be used in combination with other treatments.<sup>3</sup>

### What are the types of brachytherapy?

There are two types of brachytherapy – **high dose-rate** brachytherapy and **low dose-rate** brachytherapy.<sup>3</sup>

### What is high dose-rate brachytherapy?

High dose-rate brachytherapy involves a procedure in which **10-20 narrow tubes are inserted into the prostate**. Thin wires with radioactive tips are inserted into the tubes and are **held within the prostate for several minutes** to deliver high doses of radiation.<sup>3,15</sup>

### What is low dose-rate brachytherapy?

Low dose-rate brachytherapy involves **permanent implantation of tiny metal seeds inside the prostate**. These seeds gradually release low dose of radiation over several months.<sup>3,15</sup>

### What are the side effects of radiotherapy?

Side effects may occur during or after radiotherapy. Common side effects of radiotherapy include tiredness, erectile dysfunction, urinary or bowel issues such as diarrhea, a burning sensation during urination, and blood in the urine or stools. Some of these effects can be temporary.<sup>3</sup>

### What is the role of hormone therapy in prostate cancer?

Prostate cancer cells are dependent on hormones such as testosterone to grow. Hormone therapy is used to **block the availability of hormones to prevent cancer cell growth.**<sup>3</sup>

### At what stage is hormone therapy used in the treatment of prostate cancer?

Hormone therapy can be suitable in **both early and advanced stages** of prostate cancer. Hormone therapy is an option when cancer recurs or when the cancer is advanced and is not treatable with surgery or radiotherapy.<sup>3</sup>

### What are some options for hormone therapy in prostate cancer?

Hormone therapy options for prostate cancer include surgery or medications. One such hormone therapy is called **androgen deprivation therapy (ADT)**. This therapy can either **stop the production of androgen** (androgen synthesis inhibitors) or **prevent the androgens from binding to their receptors** (antiandrogen). Surgical procedures such as **orchidectomy (removal of one or both testicles)** are used **less frequently** because they are irreversible and sometimes used in advanced cases.<sup>3</sup>

### What are some of the drugs used for hormone therapy?

Hormone therapy such as ADT includes various classes of drugs such as **antiandrogens** (bicalutamide, flutamide, nilutamide), **corticosteroids** (methylprednisolone, prednisone) and **androgen synthesis inhibitors** (abiraterone) that are available as pills. ADT uses either a LHRH (luteinizing hormone-releasing hormone) agonist or a LHRH antagonist that interrupts the action of LHRH, a hormone released in the body that initiates production of testosterone.<sup>3</sup>



### What is the difference between LHRH agonist and LHRH antagonist?

LHRH agonists, by mimicking the actions of natural LHRH, stimulate the production of testosterone for the initial few weeks. However, the continuous presence of high levels of LHRH analogs eventually cause suppression of testosterone production. LHRH antagonists blocks testosterone production, without causing an initial rise in the testosterone levels.<sup>3</sup>

### What is the treatment schedule for LHRH agonists / antagonists?

LHRH agonists / antagonists are primarily administered as injections (either under the skin or in the muscle), except for relugolix which is given as an oral tablet. The frequency of injections or pills can vary from once a month to several times in a year. You are encouraged to discuss the options with your healthcare provider. This applies to all treatments.<sup>16</sup>

### What are the side effects of hormone therapy?

Hormone therapy can have some undesirable effects. These side effects include hot flashes, tiredness, mood changes, weight gain, and growth or tenderness of the breasts. The initial 'flare' or rise in testosterone levels by LHRH agonists may cause urinary symptoms or pain, but it generally subsides after the first few weeks. Hormone therapy can increase the risk of bone weakening, bone fractures, diabetes, and heart disease. Sexual side effects may also occur with hormone therapy, such as decreased desire for sex, erectile dysfunction, and reduced size of penis and testicles. After stopping these drugs, it can take a year or more for these effects to subside. You are encouraged to discuss these effects with your healthcare provider.<sup>3</sup>

### What will be the monitoring plan after the initial treatment of localized prostate cancer?

Once a treatment plan for localized prostate cancer completed, patients are still monitored to assess for cancer recurrence. Monitoring may be **done through a PSA test, DRE, imaging test, or other tests as your healthcare provider will determine which tests will be needed** during the monitoring period.<sup>3</sup>



### What is castration-sensitive prostate cancer?

**Castration** refers to decreasing **testosterone levels close to zero**. If prostate cancer has not been treated in past with ADT, cancer can still be 'sensitive' to hormone therapy. This type of prostate cancer is termed castration-sensitive prostate cancer.<sup>16</sup>

### What are the treatment options for castration-sensitive prostate cancer?

As castration-sensitive prostate cancer is still responsive to ADT, **ADT drugs can be used for management**. ADT alone might not be sufficient so another drug such as an **antiandrogen or androgen synthesis inhibitor may also be added to the regimen**. In some cases, chemotherapy drugs are included in the treatment protocol. Radiotherapy is also used in selected cases.<sup>16</sup>



### What is castration-resistant prostate cancer?

If prostate cancer grows despite testosterone levels being near zero, this can suggest that the **cancer cells has developed the ability to grow without testosterone**. This is called castration-resistant prostate cancer.<sup>16</sup>

### What are the treatment options for castration-resistant prostate cancer?

Although castration-resistant prostate cancer has not responded adequately to ADT, therapy is continued. This is to keep testosterone levels near zero. Additional drugs that are added depend upon factors including previous treatment received, site of metastasis, extent of spread of cancer, symptoms, possible side effects, and patient preference. **Drugs used with ADT can include another hormonal therapy, chemotherapy, targeted therapy or immunotherapy.**<sup>16</sup>

### What is the goal of chemotherapy in prostate cancer?

The goal of chemotherapy is to **kill cancer cells in the affected areas**. Chemotherapy is often considered as an **option for advanced stages of prostate cancer**. Some of the drugs used in prostate cancer include docetaxel, cabazitaxel, carboplatin, cisplatin, and mitoxantrone.<sup>16</sup>

### What are the side effects of chemotherapy drugs?

In addition to killing cancer cells, chemotherapy **affects normal cells**. This can lead to side effects such as **nausea, vomiting, diarrhea, tiredness, loss of appetite, and hair loss**. Chemotherapy drugs can also lower counts of various blood cells, which in turn **increases risk of side effects such as infections (due to lower white blood cells), bleeding (due to lower platelets) and fatigue (from having too few red blood cells)**. Healthcare providers will monitor the patients for side effects.<sup>17</sup>



### What is the role of immunotherapy in prostate cancer?

Immunotherapy is a type of treatment that kills the cancer cells using the body's own immune system. Options for immunotherapy in prostate cancer include:

- Sipuleucel-T, a cancer vaccine that bolsters the body's immune system to attack cancer cells.
- Checkpoint inhibitors such as pembrolizumab and dostarlimab that target PD-1, a checkpoint protein on T-cells.

These options are sometimes considered for advanced stages of prostate cancer and are not commonly used.<sup>18</sup>

### What are the side effects of immunotherapy?

Immunotherapy can cause side effects including fever, chills, fatigue, joint pain, nausea, and headache. It can also cause breathing difficulty and high blood pressure.

Immune checkpoint inhibitors can cause side effects including fatigue, cough, nausea, itching, skin rash, loss of appetite, constipation, joint pain, and diarrhea. These drugs can also cause infusion reactions and autoimmune reactions.<sup>18</sup>



### What is targeted drug therapy for prostate cancer?

Targeted drugs attack certain parts of the cancer cells which are uniquely expressed only on cancer cells. These drugs can **selectively kill cancer cells without doing as much harm to normal cells**. Examples of targeted drugs in prostate cancer include PARP (poly (ADP)-ribose polymerase) inhibitors.<sup>19</sup>

### How do PARP inhibitors work in prostate cancer?

PARP proteins such as BRCA1 and BRCA2 are required for repair of abnormal DNA. PARP inhibitors **block PARP proteins**. This **makes it difficult for cancer cells to repair their abnormal DNA eventually leading to cell death**.<sup>19</sup>

### What is the role of PARP inhibitors in prostate cancer?

PARP inhibitors are not appropriate for all cases of prostate cancer. They are used **only when cancer cells have specific alterations in one of their DNA repair genes** which are detected through testing samples of blood or tissue. These drugs are generally taken orally along with hormone therapy.<sup>19</sup>

### What are the side effects of PARP inhibitors used in prostate cancer?

Common side effects of PARP inhibitors include nausea, vomiting, diarrhea, tiredness, loss of appetite, low red blood cell counts (anemia), skin rash, abnormal liver blood tests, low blood platelet counts, cough, and shortness of breath.<sup>19</sup>

### What are radiopharmaceuticals?

Radiopharmaceutical drugs contain radioactive substances. They **release radiation to kill the cancer cells** and are typically injected through veins.<sup>16</sup>



### What is the role of radiopharmaceuticals in prostate cancer?

Radiopharmaceuticals are sometimes considered as a treatment option for advanced stages of prostate cancer. There are two types of radiopharmaceuticals. **One attaches on the surface of prostate cancer cells (PSMA) and transfers radioactive substances into them and the other type collects in bones and gives off radiation that can kill prostate cancer cells in the bone.** The second type of radiopharmaceutical is indicated for prostate cancer that has metastasized in bone but not to other organs.<sup>15</sup>

### What are the possible side effects of radiopharmaceuticals?

This therapy is associated with side effects including fatigue, dry mouth, nausea, loss of appetite, or constipation.

Radiopharmaceuticals can also lower your blood cell count, which may lead to weakness, easy bruising, or a higher risk of infections. It can also affect your kidneys, so patients are encouraged to drink plenty of fluids.<sup>15</sup>



### Where does prostate cancer metastasize?

In advanced disease prostate cancer can metastasize to **areas including lymph nodes** (both near the prostate as well as farther from the prostate), bones (including spine, hip bone, and ribs), or **organs** (like the liver, lung, and brain).<sup>16</sup>

### How are bone metastases detected?

Bone metastases can be detected with imaging tests including X-ray, CT scan, MRI scan, PET scan, or bone scan.<sup>20</sup>



### What are the symptoms of bone metastases?

Bone pain is a common initial symptom of bone metastases. Bones may fracture due to weakened bone structure. **With bone metastases, an excessive amount of calcium is released from bones into the blood stream.** High levels of calcium can cause **constipation, muscle pain, joint pain, excessive thirst, frequent urination and kidney failure.** If metastases **develop in the spine, spinal cord compression can occur.** Symptoms of spinal cord compression include back pain, numbness in legs, weakness in legs and urinary incontinence.<sup>20</sup>

### What are some of the treatment options for bone metastases in prostate cancer?

While therapies targeted at prostate cancer are used to control bone metastases, bone-specific treatments can be considered. Drugs used to manage bone metastases and related symptoms including bone pain include **bisphosphonates** (such as zoledronic acid), **denosumab** or **corticosteroids**. These drugs are **given by infusion or injection** (in the veins or under the skin). Other options such as external **radiation therapy and radiopharmaceuticals** may be useful in cases of bone metastases. Additionally, supportive treatments including calcium, vitamin D, and other pain medicine can also be prescribed.<sup>21</sup>

### What role do clinical trials play in treatment of prostate cancer?

A clinical trial is a type of **medical research to assess new treatment or new uses for existing treatments**. Once tested successfully in clinical trials, the treatment can be approved by the FDA (Food and Drug Administration). Your health care provider can guide you to available clinical trials.<sup>16</sup>



### How can I enroll in a clinical trial for prostate cancer?

All clinical trials have rules and criteria of eligibility for patients to be enrolled. Once the trial details are reviewed with the potential participant, an informed consent form is signed, and participants are screened to determine if they qualify for participation.<sup>16</sup>



### Is participation in a clinical trial free of cost?

Participation in a clinical trial is **free of cost**. The sponsor of the trial pays for the cost of the drug and other research-related costs. There may be some indirect costs to the participants, such as transportation to the trial site. Participants sometimes receive reimbursement for such expenses.<sup>16</sup>

### Do clinical trial participants receive active treatment or placebo?

Depending upon the design of the clinical trial, the **trial participants can be randomly assigned to groups receiving the experimental drug or the placebo**. Placebo is an inactive version of the drug. Participants are informed beforehand about the trial design, the treatment groups, and other details about the trial. A participant may withdraw from the study at any time.<sup>16</sup>

### What are the benefits of being part of a clinical trial?

Enrollment in a clinical trial can have benefits, including **access to a study drug that could be more effective** or safer than currently approved drug options, feeling more in control of your disease, and more frequent medical assessment for effectiveness and safety.<sup>22</sup>



### What are the risks of being part of a clinical trial?

Potential risks will be explained to participants prior to obtaining informed consent. Additionally, participation in a study does not guarantee favorable results.<sup>22</sup>

### What is palliative care in prostate cancer?

Palliative care (**supportive care**) is sometimes used for patients with prostate cancer whose disease is advanced, but it can be used at any stage. **The goal of palliative care is to minimize symptoms and provide comfort.** Your healthcare provider will suggest palliative care if it is an appropriate option.<sup>16</sup>

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