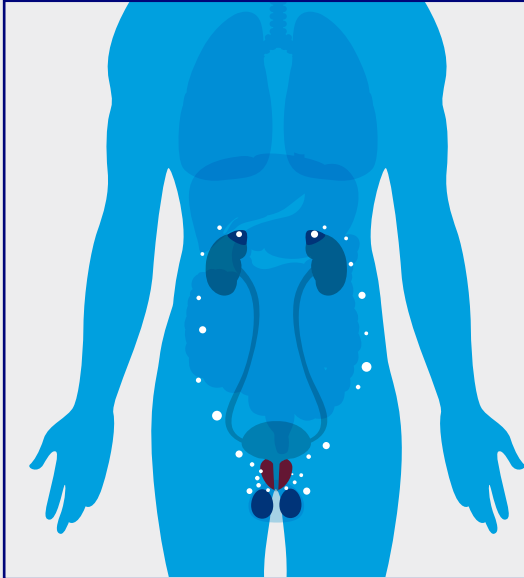


Reporter's guide to **prostate cancer**



What is the prostate?

The prostate is a gland located below the bladder, wrapped around the urethra (the tube that carries urine from the bladder to the penis). It is only found in men and is responsible for producing part of the seminal fluid.¹

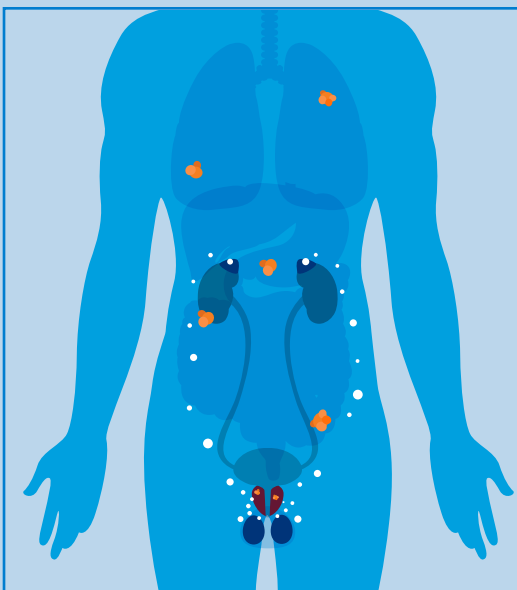


In patients with prostate cancer, androgens (hormones such as testosterone) help fuel the growth and survival of cancer.²

What is prostate cancer?

Prostate cancer occurs when cells within the prostate grow and divide at a higher than normal rate.¹ These cells may build up to form a tumor. Compared to other cancers, prostate cancer can be slow growing in some

men. Some types of prostate cancer may need minimal or no treatment.³ However in others, prostate can grow quickly and spread (metastasize) to other parts of the body, and become aggressive and potentially fatal.³



In some types of prostate cancer, despite surgical or medical castration (treatment to suppress or block the production or action of male hormones) the tumor adapts to a low testosterone environment.⁴

Who is at risk for prostate cancer?⁵

Although any man can develop prostate cancer, certain factors may increase the risk, including:



Increasing age – Especially after 50 years of age; most cases of prostate cancer are diagnosed at or after 65 years of age



Race – Prostate cancer occurs more often in African-American men and in Caribbean men of African ancestry than in men of other races



Family history – If a father, brother, or son developed prostate cancer



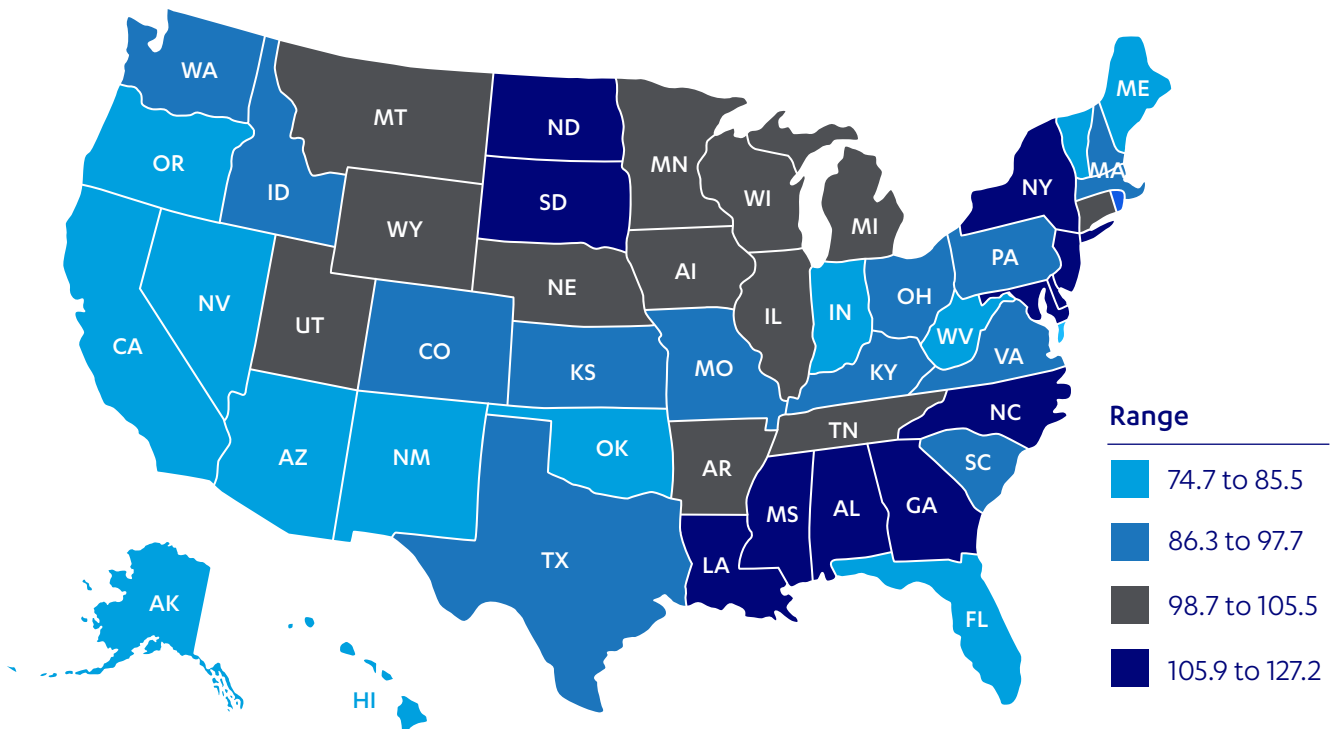
Genetic (chromosomal) abnormalities – Less commonly, inherited gene changes may increase the risk of developing prostate cancer

What is the incidence of prostate cancer?

Prostate cancer is the most common cancer among American men, other than skin cancer.⁶ About **1 in 9 men** will be diagnosed with prostate cancer in his lifetime.⁶

According to estimates from the American Cancer Society, **164,690** new cases of prostate cancer will be diagnosed in 2018 and **29,430** will die from the disease.⁶

Prostate Cancer Incidence Rates* by State⁷



*Rates are per 100,000 and are age-adjusted to the 2000 US standard population. 2014 is the most recent year for which incidence data are available.
⁷Source: US Cancer Statistics Working Group. *United States Cancer Statistics: 1999–2014 Incidence and Mortality Web-based Report*. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2017. <http://www.cdc.gov/uscs>.

What are the symptoms of prostate cancer?⁸

Often, prostate cancer is found through a prostate-specific antigen (PSA) or digital rectal examination (DRE) in men with early-stage disease and no symptoms or signs. When prostate cancer does cause symptoms or signs, it is usually diagnosed in a later stage. These symptoms and signs may include: urinary problems, problems having an erection, blood in the urine or semen, and regular pain in the lower back or in the upper thighs.

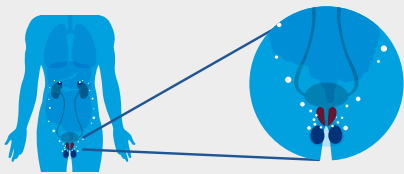
Any man experiencing such symptoms should discuss them with his doctor or healthcare professional to allow for evaluation, diagnosis, and treatment as appropriate.

How is prostate cancer diagnosed?⁹

If a healthcare provider suspects a patient may have prostate cancer, he or she will ask you about any symptoms, as well as possible risk factors discussed earlier in this guide. The following tests can be conducted to inform a healthcare professional whether to carry out a prostate biopsy to diagnose prostate cancer:



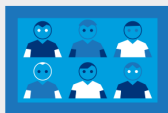
Digital rectal examination (DRE): Insertion of a finger into the rectum by a healthcare professional to check for hard or lumps in the areas in the prostate.



Prostate-specific antigen (PSA): The PSA blood test is used mainly to screen for prostate cancer in men without symptoms but is also one of the first tests done in men who have symptoms that might be caused by prostate cancer.



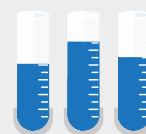
Transrectal ultrasonography: Insertion of a probe that acts as an ultrasound, into the rectum to check the prostate for abnormal areas.



Scans and x-rays: Imaging helps determine if the cancer has spread to other parts of the body (or metastasized).

To confirm a diagnosis of prostate cancer, the following are carried out:

Prostate biopsy: A biopsy is a definitive way to confirm the presence of cancer cells in the prostate. It involves the insertion of needles through the rectum into the prostate to remove small tissue samples. A pathologist will assess the cancer cells under a microscope and provide a Gleason Score. A higher Gleason Score indicates a more aggressive cancer that is more likely to spread quickly.



Prostate Cancer States

Below is a description of the clinical states of prostate cancer.

	States	Characteristics	Treatment Options
Non-metastatic	Localized Prostate Cancer	<p>Cancer has not spread outside of the prostate.¹⁰ Features include:</p> <ul style="list-style-type: none"> • Low risk: PSA < 10 ng/ml and Gleason Score ≤ 6¹⁰ • Intermediate risk: PSA 10-20 ng/ml and Gleason Score 7¹⁰ • High risk: PSA > 20 ng/ml and Gleason Score 8-10¹⁰ 	<ul style="list-style-type: none"> • Watchful waiting of early stage • Observation • Minimally invasive procedures (robotic/laparoscopic surgery, cryosurgery or high-intensity focused ultrasound) • Surgery (radical prostatectomy) • Radiation therapy with or without ADT
	Localized but Advancing Prostate Cancer (as shown by rising PSA)	<p>Cancer has started to break out of the prostate, or has spread to the area just outside the prostate.¹¹</p> <p>An estimated 20%-40% of men experience rising PSA after treatment with surgery or radiation, a state known as biochemical recurrence, within 10 years.¹¹</p>	<ul style="list-style-type: none"> • Surgery or radiation (radiation could be accompanied by ADT) • Intermittent hormone therapy/ADT • Watchful waiting if elderly or medically compromised
	Non-metastatic Castration-Resistant Prostate Cancer	<p>Cancer no longer responds to medical or surgical treatments that lower testosterone, but has not yet been found in other parts of the body.¹² Features include:</p> <ul style="list-style-type: none"> • Lack of detectable metastatic disease by imaging¹² • Rising PSA while on androgen deprivation therapy (ADT)¹³ • Serum testosterone level below 50 ng/dL¹⁴ 	<ul style="list-style-type: none"> • Hormone therapy/ADT • Watchful waiting • Androgen pathway treatments

90% of men with non-metastatic CRPC will eventually develop bone metastases, which can lead to pain, fractures, and spinal cord compression.¹⁵ The relative 5-year survival rate for distant stage prostate cancer is about 29%.¹⁶

Metastatic	Metastatic Hormone-Sensitive (Castration-Sensitive) or Metastatic Hormone-Naïve (Castration-Naïve) Prostate Cancer	<p>Cancer has spread to other parts of the body outside of the prostate, and has either not been previously treated with ADT or is still responsive to ADT.¹⁷</p>	<ul style="list-style-type: none"> • Hormone therapy/ADT • Androgen pathway treatments • Chemotherapy • Radiation therapy
	Metastatic Castration-Resistant Prostate Cancer	<p>Cancer no longer responds to hormone treatment that lowers androgens and has spread to other parts of the body.¹⁸ The most common metastatic sites are bones, followed by lymph nodes, lungs, and liver.¹⁸</p>	<ul style="list-style-type: none"> • Hormone therapy/ADT • Androgen pathway treatments • Immunotherapy • Chemotherapy • Radiation therapy • Radiopharmaceuticals

Unlike other cancers, prostate cancer is not easy to stage. Similarly, there are no general time periods. Prostate cancer can evolve slowly or quickly.

Prostate Cancer Treatment Glossary¹⁹⁻²²

Following is a list of the cancer treatments that healthcare providers consider while treating men with prostate cancer.

Minimally Invasive Procedures: Involves procedures such as robotic/laparoscopic surgery, cryosurgery, transurethral resection surgery, or high-intensity focused ultrasound (HIFU).

Surgery: An option for localized prostate cancer is to perform a radical prostatectomy to remove the prostate gland and some surrounding tissue. Some prostatectomies include a pelvic lymph node dissection to remove lymph nodes near the prostate.

Observation: For patients with localized prostate cancer that is at high risk for developing metastasis, treatment option can include observation (with maintenance of a castrate-state).

Active Surveillance: Involves regular tests to see if the cancer is growing, including repeated biopsies. No treatment will be administered unless the patient wants to proceed with treatment once the cancer has grown. This avoids or delays the risks and possible side effects of treatment, which can outweigh the benefits for selected patients, specifically those with low-risk prostate cancer. Patients on active surveillance may need to be moved to surgery or radiation therapy for a variety of reasons.

Watchful Waiting: May be an option for older men and those with other serious or life-threatening illnesses. With watchful waiting, routine PSA tests, DRE, and biopsies are not usually performed. Men who start on active surveillance who later have a shorter life expectancy may switch to watchful waiting at some point to avoid repeated tests and biopsies.

Hormone Therapy / Androgen Deprivation Therapy: Androgen deprivation therapy (ADT), also referred to as androgen suppression therapy, can block the production and use of androgens. Currently available hormone therapy treatments can reduce androgen production by the testicles, block the action of androgens in the body, or block the production of androgens throughout the body. For advanced prostate cancer, a bilateral orchiectomy to remove the testicles can be performed, preventing testosterone from increasing the speed of prostate cancer growth (surgical castration).

Androgen Pathway Treatments: Advanced prostate cancer that has stopped responding to ADT may require additional hormone therapy that can either block androgens from binding inside the prostate cancer cells or reduce the production of androgens at multiple sources.

Immunotherapy: Treatment that stimulates the body's immune system to help it recognize and fight off cancer cells. It involves removing some of the patient's white blood cells, separating out the immune cells, and returning modified immune cells back to the patient.

Chemotherapy: May be used to kill the rapidly dividing and circulating cancer cells.

Radiation Therapy: Uses high-energy radiation to shrink tumors and kill cancer cells. X-rays, gamma rays, and charged particles are types of radiation used for cancer treatment. It is administered from outside the body (external beam) or, in select patients, inside the body via "pellets" placed in the prostate (brachytherapy). In the later stages of prostate cancer, radiation may be used to reduce pain.

Radiopharmaceuticals: Uses drugs with radioactive elements injected into a vein to treat cancer that has moved to the bone and can sometimes be combined with external beam radiation.

References:

- ¹ Cancer.org. What is prostate cancer? <https://www.cancer.org/cancer/prostate-cancer/about/what-is-prostate-cancer.html>. Accessed January 2018.
- ² Cancer.gov. Hormone therapy for prostate cancer. <https://www.cancer.gov/types/prostate/prostate-hormone-therapy-fact-sheet>. Accessed January 2018.
- ³ Mayoclinic.com. Prostate cancer. <http://www.mayoclinic.com/health/prostate-cancer/DS00043>. Accessed January 2018.
- ⁴ Cancer.org. Treating prostate cancer that doesn't go away or comes back after treatment. <https://www.cancer.org/cancer/prostate-cancer/treating/recurrence.html>. Accessed January 2018.
- ⁵ Cancer.net. Risk factors and prevention. <http://www.cancer.net/cancer-types/prostate-cancer/risk-factors-and-prevention>. Accessed January 2018.
- ⁶ Cancer.org. Key statistics for prostate cancer. <https://www.cancer.org/cancer/prostate-cancer/about/key-statistics.html>. Accessed January 2018.
- ⁷ Cdc.gov. Prostate cancer rates by state. <https://www.cdc.gov/cancer/prostate/statistics/state.htm>. Accessed January 2018.
- ⁸ Cancer.net. Symptoms and signs. <http://www.cancer.net/cancer-types/prostate-cancer/symptoms-and-signs>. Accessed January 2018.
- ⁹ Cancer.org. Tests for prostate cancer. <https://www.cancer.org/cancer/prostate-cancer/detection-diagnosis-staging/how-diagnosed.html>. Accessed January 2018.
- ¹⁰ Auanet.org. American Urological Association. [http://www.auanet.org/guidelines/clinically-localized-prostate-cancer-new-\(aua/astro/suo-guideline-2017\)#x6910](http://www.auanet.org/guidelines/clinically-localized-prostate-cancer-new-(aua/astro/suo-guideline-2017)#x6910). Accessed January 2018.
- ¹¹ Ward JF, et al. Rising prostate-specific antigen after primary prostate cancer therapy. *Nature Clinical Practice. Urology* [01 Apr 2005, 2(4):174-182]. <https://www.nature.com/articles/ncpuro0145>. Accessed January 2018.
- ¹² Scher HI, et al. Design and end points of clinical trials for patients with progressive prostate cancer and castrate levels of testosterone: recommendations of the Prostate Cancer Clinical Trials Working Group. *J Clin Oncol*. 2008; 26:1148-1159. <https://www.ncbi.nlm.nih.gov/pubmed/18309951>. Accessed January 2018.
- ¹³ Scher HI, et al. Trial design and objectives for castration-resistant prostate cancer: Updated recommendations from the Prostate Cancer Clinical Trials Working Group 3. *J Clin Oncol*. 2016; 34:1402-1418. <https://www.ncbi.nlm.nih.gov/pubmed/26903579>. Accessed January 2018.
- ¹⁴ Virgo K, et al. Second-line hormonal therapy for men with chemotherapy-naïve, castration-resistant prostate cancer: American Society of Clinical Oncology Provisional Clinical Opinion. *Journal of Clinical Oncology*. 2017; 0732-183X/17/3599-1. <http://ascopubs.org/doi/abs/10.1200/JCO.2017.72.8030>. Accessed January 2018.
- ¹⁵ Saad F, et al. The 2015 CUA0CUOG guidelines for the management of castration-resistant prostate cancer (CRPC). *Can Urol Assoc J*. 2015;9(3-4):90-96. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4455631/>. Accessed January 2018.
- ¹⁶ Cancer.org. Survival rates for prostate cancer. <https://www.cancer.org/cancer/prostate-cancer/detection-diagnosis-staging/survival-rates.html>. Accessed January 2018.
- ¹⁷ Harvard University. Prostate cancer knowledge. Androgen-independent prostate cancer. <http://www.harvard-prostateknowledge.org/androgen-independent-prostate-cancer>. Accessed January 2018.
- ¹⁸ Cancer.org. Understanding advanced cancer, metastatic cancer, and bone metastasis. <https://www.cancer.org/treatment/understanding-your-diagnosis/advanced-cancer/what-is.html>. Accessed January 2018.
- ¹⁹ Kevin M. Slawin, MD, Christopher J. DiBlasio, MD, Michael W. Kattan, PhD. Minimally invasive therapy for prostate cancer: Use of nomograms to counsel patients about the choice and probable outcome of therapy. 2004; 6(supp 4): S3 – S8. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1472870/>. Accessed January 2018.
- ²⁰ Cancer.net. Prostate cancer treatment options. <http://www.cancer.net/cancer-types/prostate-cancer/treatment-options>. Accessed January 2018.
- ²¹ Cancer.gov. Radiation therapy for cancer. <https://www.cancer.gov/about-cancer/treatment/types/radiation-therapy/radiation-fact-sheet>. Accessed January 2018.
- ²² Nhs.uk. Treatment. <http://www.nhs.uk/Conditions/cancer-of-the-prostate/Pages/treatment.aspx>. Accessed January 2018.