

Module 1: Introduction

What is cancer? Cancer is the uncontrolled, abnormal growth of cells. The growth (tumor) can be benign (non-cancerous) or malignant (cancerous).

What is the prostate? The prostate gland is part of the male reproductive system which makes the fluid that carries sperm. It is a walnut or crabapple size gland that only men have. The gland is located in front of the rectum and below the bladder.

The urethra (the tube that carries urine from the bladder to exit the body) runs through the center of the prostate gland. As men age, the prostate tends to increase in size. This can cause the urethra to narrow and decrease urine flow.

Module 2: Prostate Cancer and the Risk Factors

What is prostate cancer? Prostate cancer is the abnormal growth of cells in the prostate gland. The cells divide and create new cells that the body does not need which forms a mass of tissue called a tumor.

How fast do prostate cancer cells grow? Some prostate cancers grow and spread very quickly. Many, if not most, grow slowly. Studies have shown that many older men who died of other diseases also had prostate cancer that never affected them during their lives.

Autopsy studies have shown microscopic evidence of prostate cancer in 15-30% of men over age 50 and in 60–70% of men who reach age 80.

What are the risk factors for prostate cancer? **Age, race and family history appear to be clear and major risk factors.**

As a man ages, his risk of developing prostate cancer increases dramatically. The age-related increase is greater for prostate cancer than for any other type of cancer. The average age of all men at diagnosis is between 65 and 70; the average age of all men at death is between 80 and 85 years.

Men at highest risk (**men of African descent and men whose fathers or brothers have been diagnosed with prostate cancer**), die much earlier than men in the average risk group. Therefore, considerable care and attention must be given to the cases of men at highest risk starting with those men knowing and documenting their family medical history-especially prostate cancer family history.

Module 3: Uncontrollable Risk Factors

The incidence (new cases per 100,000 a year) of prostate cancer in the United States varies by race. Black men have the highest rates. White and Hispanic men are 40-50% lower than Black men. Asian/Pacific Islander and Native American/American Indian men have the lowest rates.

Studies of identical and fraternal twins have found that prostate cancer has a stronger hereditary component than many other cancers. Having one first-degree relative (a brother or father) with prostate cancer doubles the risk of developing the disease; having a second-degree relative (an uncle or grandfather) with the disease confers only a small increase in risk.

A number of genetic alterations that affect how the body handles inflammation and infections, fat metabolism, repair of genetic damage, and other processes have been linked to prostate cancer development and progression.

Researchers found that men who inherit a rare mutation on a gene known as HOXB13 are up to 20 times more likely than non-carriers to develop prostate cancer. However, the mutation is responsible for only 2 to 5 percent of prostate cancer cases.

The results of recent research suggest that a test for inherited DNA-repair gene mutations might one day be used to identify men who require early and frequent screening for prostate cancer. It may also help determine which men diagnosed with prostate cancer would require prompt treatment.

The most common mutation found among the men in a 2016 study was a defect in the DNA-repair gene BRCA2, which made up 44% of all mutations. BRCA2 mutations are closely associated with breast, ovarian, and prostate cancer.

Another DNA-repair gene, BRCA1, represented 7 percent of the mutations in this study. If a woman knows that her father, brother, or a son carries germline BRCA1 or BRCA2 mutations, she may choose to pursue more aggressive cancer screening as a matter of good practice.

Module 4: Controllable Risk Factors

Increasing evidence suggests that fat intake, physical inactivity or being overweight may influence the development or progression of prostate cancer.

Factors such as diet, exercise, body weight or exposure to certain forces influence prostate cancer progression from microscopic tumors to clinically significant ones.

Many studies that have looked at the relationship between dietary fat and prostate cancer have found a higher risk of the disease among men with higher (especially saturated fat from animal

products) fat diets. Fat makes up 30 to 40 percent of the calories in the typical American diet, compared to 15% in Japan.

A higher intake of vegetables may lower the risk of prostate cancer. In a study in the Journal of the National Cancer Institute, men who ate four or more servings of vegetables a day were 35% less likely to develop prostate cancer than those who ate two or fewer servings per day.

The relationship between calories taken in versus calories burned-energy balance-also may affect prostate cancer risk. Preliminary evidence suggests that men with the greatest calorie intake are the most likely to develop prostate cancer than those whose consumption is more modest.

Obesity-defined as having a body mass index (BMI) of 30 or more—is known to increase the risk of some types of cancer as well as cancer deaths. It is unclear whether obesity influences the development of prostate cancer specifically; however, several studies have found that obese men have higher-grade prostate cancer at diagnosis and a higher risk of cancer recurrence after radical prostatectomy and radiation treatment than men who are not obese.

Module 5: What You Should Know

- Prostate cancer is the most commonly diagnosed cancer in African Americans.
- African Americans have the highest rate of prostate cancer diagnosis compared to all other men.
- African Americans have the highest prostate cancer death rate of all men.
- The African American prostate cancer death rate disparity is the highest for any type of major cancer.
- Prostate cancer is the second leading cause of cancer-related deaths among African Americans.
- African Americans are more than twice as likely to die of prostate cancer during their lifetime.
- 1 in 6 African Americans will be diagnosed with prostate cancer during their lifetime. 1 in 9 of all men will get prostate cancer during their lifetime.
- Prostate cancer accounts for approximately 37% of all cancers among Black men.
- The African American prostate cancer death rate declined by more than 40% from 1992 to 2010.
- Cancer deaths among African Americans ages 40-49 decreased by 50% from 1991 to 2010 (faster than all other groups).
- Genetic testing may be indicated if there is a personal history of metastatic prostate cancer or a personal history of a high-grade prostate cancer (Gleason score of 7 or higher) with a family history of prostate, breast, ovarian or pancreatic cancer or a personal history of prostate cancer and other primary cancers.

Module 6: Hampton Roads Prostate Cancer Mortality, 2008-2012 by Race and Health Districts

Virginia has among the highest prostate cancer mortality rates in the nation. The statistics in Hampton Roads are frightening. Please compare the state rate for all races of 22.4 per 100,000 with that of the following regional health districts:

	All Race	White	Black
Virginia	22.4	18.9	46.2
Chesapeake	27.8	20.9	45.8
Hampton	31.0	19.7	50.9
Norfolk	24.7	19.4	37.4
Peninsula	23.7	20.2	42.4
(excludes Hampton and includes Newport News, Williamsburg, Poquoson, James City and York Counties)			
Portsmouth	37.4	—	65.0
Virginia Beach	20.7	18.4	47.4
Western Tidewater	32.9	20.4	61.5
(includes Suffolk, Isle of Wight, Franklin City and Southampton County)			

Module 7: Symptoms and Early Detection Tests and Exams

Early Stage Localized (still within the gland) Prostate Cancer has NO SYMPTOMS

Later Stage Prostate Cancer may produce the following symptoms:

- Urinary frequency
- Slow urinary flow

- Painful urination
- Blood in urine or semen
- Back and thigh pain
- Impotence

Early Detection Test:

The serum prostate-specific antigen test (PSA)

- PSA is a protein secreted by both normal and malignant prostate cells.
- PSA is measured by a simple blood test.
- A low PSA does not always mean that cancer is not present.
- An elevated PSA does not always mean that cancer is present. It does serve as a “red flag”.
- Sudden PSA changes can be caused by sexual activity, infection, an enlarged prostate or cancer.
- An abnormal PSA may lead to a biopsy.

Early Detection Exam:

The digital rectal examination (DRE)

- Your doctor will exam your prostate gland for irregularities by feeling the gland through the rectum.
- The DRE enhances the value of PSA testing in early stage disease detection.
- An abnormal DRE may lead to a biopsy.

PSA and DRE are complementary and together are able to detect prostate cancer when individually they might not.

Prostate cancer is diagnosed with a biopsy. During a biopsy a small sample of prostate tissue is removed with a needle and examined by a pathologist under a microscope.

Advantages of Early Detection

- PSA tests can detect prostate cancer in its earliest stages.
- When a PSA test and DRE are used together, they can find cancers earlier.
- The earlier prostate cancer is found, the more treatment options a man has and the better his chance for cure.
- When cancer is found early, it is least likely to have spread and may be easier to treat.
- Early detection leads to better outcomes.

Module 8: The Call To Action: (What You Must Know and Do)

(1) Advocate and promote to men and their families through awareness and educational activities with a focus on the benefits and potential harms of PSA testing, digital rectal exams, and wellness activities involving diet, nutrition, exercise, weight control, psychosocial, and cultural sensitivities beginning at age 35.

(2) Inform men especially those deemed to be at high-risk for having prostate cancer that they should start baseline PSA testing beginning at age 40 for predicting their future risk of prostate cancer. These men should make individualized decisions to be tested and examined based on their risk factors after discussion with their health care provider. Individualized decision making should be extended to men age 70 and above provided they have a potential life expectancy of 15 years or more.

(3) Inform men especially those deemed to be at high-risk for having prostate cancer that PSA testing should not be considered on its own, rather as part of a multivariate approach to early prostate cancer detection. That would include prostate volume, velocity, and density measurements, and other tools that can help improve risk stratification, **especially the digital rectal examination (DRE).**

(4) Inform men especially those deemed to be at high-risk for having prostate cancer that digital rectal exams (DREs) are absolutely necessary and should follow the PSA and other tests performed during the same visit with their health care provider.

(5) Inform men especially those deemed to be at high-risk for having prostate cancer that they should not only get the PSA test and DRE, they should also know their PSA numbers for the past three tests and the exam results for the last three examinations. Then, they should discuss any changes including urinary flow with their health care provider.

(6) Inform men especially those deemed to be at high-risk for having prostate cancer that a prostate cancer diagnosis must be separated from treatment. Men diagnosed with prostate cancer should discuss all available treatment options with their health care provider.

(7) Inform men especially those deemed to be at high-risk for having prostate cancer that they should know and document their family medical history.

(8) Inform men especially those deemed to be at high-risk for having prostate cancer that prostate cancer diagnosis must be separated from prostate cancer treatment.

Module 9: Treatment Options

Active Surveillance—a method of managing prostate cancer in which a man is closely monitored, but curative treatment is not initiated until the cancer progresses.

Radical Prostatectomy—A type of surgery for prostate cancer; removes the entire prostate and the seminal vesicles (glands located on each side of the male bladder that secrete seminal vesicles).

* Nerve-sparing radical retro pubic prostatectomy— A type of surgery for prostate cancer in which structures important for erectile and bladder function are left intact. Associated with lower risk of erectile dysfunction and severe incontinence than traditional radical prostatectomy.

* Laparoscopic radical prostatectomy— A type of surgery that involves performing a procedure through small incisions in the abdomen using small instruments and a tiny camera. A variation on the laparoscopic procedure is the robotic-assisted laparoscopic radical prostatectomy, using the da Vinci robotic system.

Radiation Therapy—A therapy for prostate cancer that uses an X-ray machine to aim high energy radiation at the prostate. Refinements of three-dimensional conformal radiation therapy (3DCRT) have resulted in the following:

* Intensity-modulated radiation therapy (IMRT) relying on computer software to determine the orientation, number and intensity of the radiation beams, IMRT can improve the precision of earlier external beam therapies.

* Proton-beam radiation therapy is delivered in the same manner as (3DCRT) but uses positively charged subatomic particles (protons) instead of photons to kill cancer cells.

Brachytherapy— A prostate cancer treatment that involves implanting radioactive seeds into the prostate.

Cryotherapy—The use of extreme cold to treat prostate cancer.

Hormone Treatment—A treatment for prostate cancer that has spread beyond the prostate. Slows the progression of cancer by preventing testosterone from acting on cancer cells but does not cure the cancer.

Chemotherapy—A treatment for prostate cancer that progresses despite hormonal therapy. It can help to relieve pain and other symptoms associated with advanced prostate cancer that no longer responds to hormone therapy.

Symptom Relief—When hormone therapy loses its effectiveness, other treatments are available to relieve pain and improve the quality of life. There is a wide range of medications

that can be used to ease pain. Bone pain can be treated with a class of medications known as bisphosphonates, radiation therapy, or injecting ions of a radioactive substance called strontium-89.

Immunotherapy—A relatively new option for treating prostate cancer that no longer responds to hormone treatment.

Over the past two years several newer therapies have been approved that give doctors multiple and unique ways to treat prostate cancer.

Module 10: Managing Treatment Side Effects

Incontinence

- Managed with pelvic floor exercises
- Improved with medication
- Corrected with surgery

Impotence

- Managed with medication
- Improved with vacuum pump
- Corrected with surgery

Module 11: Glossary

Active surveillance—a method of managing prostate cancer in which a man is closely monitored, but curative treatment is not initiated until the cancer progresses.

Age-specific PSA—an adjustment of the PSA value that accounts for the natural, gradual increase in PSA that occurs with age as the prostate enlarges.

Benign prostatic enlargement (BPH)—noncancerous enlargement of the prostate gland due to an increase in the number of prostate cells.

Biopsy—a way of diagnosing diseases. It is an examination of tissue to discover the presence, cause or extent of a disease.

Brachytherapy—a prostate cancer treatment that involves implanting radioactive seeds into the prostate gland.

Catheterization—a procedure in which a tube is inserted into the urethra to drain urine from the bladder. Used after prostate surgery and in the treatment of acute urinary retention.

Cryotherapy—the use of extreme cold to treat a disease such as prostate cancer.

Digital rectal exam (DRE)—an examination in which a doctor inserts a lubricated, gloved finger into the rectum to feel for abnormalities of the prostate and the rectum.

External beam radiation therapy—a therapy for prostate cancer that uses an X-ray machine to aim high energy radiation at the prostate.

Gleason score—a classification system for prostate cancer based on the microscopic appearance of cancer cells; it is used to predict the seriousness of the cancer and the need for treatment. Scores range from 2-10. A lower score indicates that the cancer is less aggressive.

Hormone therapy—usually a treatment for prostate cancer that has spread beyond the prostate. It slows the progression of cancer by preventing testosterone from acting on cancer cells but does not cure the cancer.

Incontinence—an inability to control bladder function.

Laparoscopy—a technique in which a tiny instrument containing a light and a camera is inserted into the body through a small incision. Used for a variety of surgical and diagnostic procedures, including radical prostatectomy.

Libido—sex drive.

Metastatic prostate cancer—prostate cancer that has spread from the prostate to other parts of the body.

Nerve-sparing radical prostatectomy—a type of surgery for prostate cancer in which structures important for erectile and bladder function are left intact. Associated with a lower risk of erectile dysfunction and severe incontinence than traditional radical prostatectomy.

Palliative therapy—treatment aimed at relieving pain and limiting disease complications rather than offering a cure.

Pelvic floor exercises—exercises to strengthen the pelvic floor muscles. May help men recover bladder function after prostate cancer.

Penile clamp—a device that compresses the penis to prevent urine from leaking.

Percent free PSA—the amount of PSA not attached to blood proteins divided by the total amount of PSA. Men with prostate cancer have a lower percentage of free PSA than men with benign prostatic enlargement.

Perineal prostatectomy—type of radical prostatectomy; an incision is made in the perineum instead of the abdomen.

Perineum—the area between the scrotum and rectum.

ProstaScint—a test for detecting prostate cancer that has spread to other parts of the body (except the bones).

Prostate—a gland the size and shape of a walnut or crabapple. It surrounds the upper portion of the male urethra and produces part of the fluid that makes up semen.

Prostate-specific antigen (PSA)—an enzyme produced by the glandular cells of the prostate and secreted in the seminal fluid released during ejaculation. High blood levels may indicate prostate cancer but also be caused by benign prostatic enlargement (BPH) and infection.

Prostatitis—an inflammation of the prostate that may cause pain in the lower back and in the area between the scrotum and the rectum.

PSA density—PSA level divided by size of the prostate. Allows the doctor to better distinguish between benign prostatic enlargement (BPH) and prostate cancer by taking prostate size into account when assessing the PSA level.

PSA velocity—a measurement of the changes in PSA values over time. PSA velocity is greater in men with prostate cancer than in those without the disease.

Radical prostatectomy—a type of surgery for prostate cancer; removes the entire prostate and the seminal vesicles.

Seminal vesicles—glands located on each side of the male bladder that secrete seminal fluid.

TNM—a system for describing the clinical stage of a cancerous tumor using T numbers to indicate whether the tumor can be felt and, if so, the extent of the tumor. N numbers indicate cancer that has spread to the lymph nodes, and M numbers are used to indicate cancer that has spread to other parts of the body.

Urethra—the canal through which urine is carried from the bladder and out of the body. In men the urethra also carries semen that is released during ejaculation.

Watchful waiting—an approach to managing benign prostatic enlargement (BPH) or in which no treatment is immediately attempted, but the patient is carefully monitored.

Module 12: References

“Treating the Man and the Cancer“

While multiple sources were used to create this educational guide, by far the 2018 Prostate Disorders White Paper authored by H. Ballentine Carter, MD Professor, Department of Urology and Oncology and Director, Adult Urology at Johns Hopkins School of Medicine was the primary source. The Hampton Roads Prostate Health Forum, Hampton University, the 100 Black Men of America, the Prostate Health Education Network, the Virginia Department of Health-Division of Policy and Evaluation and Comprehensive Cancer Control Program, the National Institutes of Health, the American Cancer Society, the Centers for Disease Control and Prevention (CDC), the Omega Psi Phi Fraternity, Inc. -Alpha Alpha Chapter and ZERO The End of Prostate Cancer were frequently used resource references.