INTRODUCTION

Prostate cancer is the second most common cancer in men (right after skin cancer), but it is also the most treatable. In 2013, approximately 238,590 men were diagnosed with prostate cancer, but the majority of those new cancers were considered “early stage.”

Prostate cancer starts out as a small lesion confined to the prostate. It is at this early stage that potentially lethal cancers must be found and treated in order to be reliably cured. If left untreated, prostate cancer has the ability to metastasize (or spread) to other organs and tissues in the body, and metastatic cancer is ultimately fatal.

But it’s important to realize that not every prostate cancer is lethal. Unlike more aggressive cancers (e.g., lung, pancreatic), prostate cancer is usually slow growing and in some cases may not pose a threat to health or life. If detected early, there is a wide window of time to treat it.

There are many treatment options available for prostate cancer today. These range from very invasive choices, like surgical removal of the prostate, to a “wait and see” approach involving no intervention but regular and careful monitoring of the condition. Each treatment choice has its own pros and cons; procedures like surgery and radiation may have a significant impact on a man’s urinary and sexual health. What treatment path you choose is very much an individual decision influenced not just by cancer stage and health implications, but also by a man’s current lifestyle and other personal factors.

With this in mind, prostate cancer detection and diagnosis has become an art, with the goal of finding and treating the disease with a minimal amount of harm to the patient. And the science is here to make this a reality. Technologies that can discern tumors from benign (or non-cancerous) prostate conditions without requiring an invasive biopsy, and pinpoint tumor tissue for appropriate treatment, are now available. There are also a growing number of new treatments to treat prostate cancer that don’t carry some of the same risks and complications as older methods. And that is good news for all men.

This e-book was created to provide today’s prostate cancer patient with a brief over-
view of these innovative new options for prostate cancer care, and the advantages they may offer over older traditional treatments. It is not intended to replace individual professional medical advice and care. All treatment options and potential outcomes and complications should be discussed with a qualified healthcare provider.
DIAGNOSING PROSTATE CANCER

Because it causes no symptoms in its early stages, when it is most treatable, appropriate screening for prostate cancer is very important. Most men are familiar with the oldest method of screening – the digital rectal examination (DRE). A doctor performs the DRE by inserting the finger into the rectum and palpating (feeling) the prostate gland. But most early prostate cancers usually can’t be felt on DRE, and the doctor can’t access the entire prostate gland during DRE. For these reasons, DRE alone is not an adequate strategy for screening for early prostate cancer.

You may also know about the prostate specific antigen, or PSA, test. PSA is a protein that is produced by the prostate. When the prostate is diseased or damaged, levels of PSA in the bloodstream rise. Men with prostate cancer may experience a rise in PSA levels. However, high PSA can also be a sign of infection, inflammation, or injury to the prostate. It is also associated with benign prostatic hyperplasia (BPH) and prostatitis—two common and non-cancerous prostate conditions.

So a high PSA, or a PSA that rises over time, is a sign that something is wrong with the prostate, but it doesn’t necessarily mean prostate cancer is present. How do you know for sure?

If your PSA is elevated, your doctor may recommend biopsy. The most common procedure in the U.S. today is transrectal ultrasound (TRUS)-guided biopsy. But it is an invasive procedure that can cause side effects. It also relies on a random sampling of prostate tissue, and therefore may miss cancers. There is a newer and more effective biopsy procedure known as mpMRI-guided biopsy that is more clinically accurate than TRUS-guided biopsy discussed later in this book. But it’s important to remember that all biopsies are invasive, and therefore carry risks of infection and bleeding (although MRI-guided biopsy has a significantly lower risk of these complications).

Your other option is to get a detailed picture of the prostate taken with multiparametric magnetic resonance imaging, or mpMRI. mpMRI has the advantage of accurately imaging the entire prostate. It can pinpoint any suspicious tumor tissue—or rule out a prostate cancer completely. Then if a biopsy is truly needed, it can be performed with an accurate “map” of the area.

If you choose this procedure, it is critical to find an MRI center with the latest mpMRI software, a 3 Tesla (3T) magnet, and a radiologist experienced with prostate mpMRI.
**Transrectal Ultrasound (TRUS)-Guided Biopsies**

Since the late 1980s, TRUS-guided biopsy has been the standard of care in the U.S. The procedure involves taking samples of tissue from random sections of the prostate using ultrasound guidance. It is often recommended by a doctor if PSA tests and other indicators, like family history, suggest that a man may have prostate cancer.

A TRUS guided biopsy is usually performed in the urologist’s office. Before the procedure begins, the doctor administers a local anesthetic to numb the prostate area. An ultrasound probe about a half-inch wide is then inserted into the rectum. The probe uses soundwaves to provide a picture of the prostate so the doctor can guide the biopsy device to a place where tissue samples can be taken with a biopsy needle. The whole procedure is usually complete in 15 minutes.

The standard TRUS-guided biopsy takes a 12-core biopsy, or twelve samples of tissue from the prostate. This represents a very small sampling of the total prostate. In addition, there are some cancers that originate in the transition (central) zone of the prostate, and this region is not typically sampled as part of a 12-core biopsy. Therefore, many cancers can still be missed by a 12-core TRUS-guided biopsy.

Mild discomfort in the perineum (the area between the scrotum and rectum) may occur for a few days following TRUS-guided biopsy. Potential side effects include blood-borne systemic infections and bleeding.

**Multiparametric Magnetic Resonance Imaging (mpMRI)**

MRI uses magnetic fields to generate detailed, high resolution three dimensional images of the body. A multiparametric MRI uses computer software to generate several different “views” of the prostate. This allows the radiologist to zero in on potential targets that have a high probability of representing a cancer rather than the “pin the tail on the donkey” approach of TRUS-guided random sample core biopsy.

**mpMRI can detect prostate cancer in three different ways:**

1. Identifying angiogenesis, or new blood vessel formation. Tumor tissue has unique blood flow patterns around it that are detectable with mpMRI.

2. Looking for patterns of diffusion restriction. When cells are packed tightly together (a hallmark of tumor tissue), there is very slow water movement around them, which appears on MRI.

3. Using T2-weighted contrast to identify tumor tissue. A normal prostate has a lot of water in it, which looks very white or bright on MRI. Tumor tissue will look dark.

A few facilities, including the Sperling Prostate Center, have the capability to do biop-
sies inside the MRI. This is called in-bore, or in- gantry mpMRI-guided biopsy of the prostate. As the MRI images the prostate and locates the suspicious tumor tissue, the radiologists can insert a biopsy needle directly into the tissue to sample it. Typically only two to three targeted samples are needed versus the twelve random sample standard in TRUS-guided biopsy. The Sperling Prostate Center has performed the most mpMRI-guided biopsies in the country, and unlike other centers, can offer biopsy results in 24-48 hours in most cases.

The mpMRI scans are combined with pathology findings from the biopsy samples to confirm the location, size and aggressiveness of any confirmed tumors. The end result is a detailed prostate map that provides a blueprint for treatment selection and treatment planning.
PROSTATE CANCER TREATMENT

If biopsy and/or imaging results determine that you do have prostate cancer, there are many choices available for treatment. What treatment you decide on will depend in part on the stage and grade of your cancer. Your age, lifestyle, and personal preferences will also weigh into your decision. Educate yourself on the options available to you. As you speak with your doctor about your choices, make sure you ask questions about the side effects, success rates, and complications of each.

**Active Surveillance**

Men with early stage prostate cancer who are considered low risk may have the option of monitoring their condition over time through regular PSA tests, imaging, and biopsies. This is known as *active surveillance* (and is sometimes called “watchful waiting”).

Active surveillance may be a good choice for older men or men with other serious health conditions for whom surgery might be too dangerous. It may also be an option for younger or healthier men with extremely slow growing cancers who would prefer not to undergo treatment. If your Gleason score is higher than 6, you are probably not a good candidate for active surveillance.

With advances in focal laser ablation (discussed below), many men on active surveillance are choosing this minimally invasive treatment due to its limited side effects balanced against the psychological burden of watchful waiting.

**Surgery**

Removing a prostate cancer tumor, or the entire prostate gland, can be performed by a skilled surgeon who is typically a urologist. Side effects from this prostate cancer treatment method may include incontinence, impotence, and (less commonly) changes in penis length. While some of these side effects may improve over time, some men do experience ongoing erectile dysfunction after prostate cancer surgery.

A surgical method called *nerve-sparing prostatectomy* can preserve the nerve bundles near the prostate and minimize, though not eliminate, incontinence and impotence side effects. However, not all men are candidates for nerve-sparing prostatectomy. Your physician can tell you if this is an option for you.
**Radiation**

Radiation involves using high dose x-rays to kill or shrink cancer cells. Prostate cancer treatment with radiation can be external or internal. External radiation uses a machine to direct x-ray beams at the tumor. Internal radiation involves inserting a radioactive substance into the prostate to treat surrounding tissue.

Because radiation makes a later prostatectomy surgery impossible, it is usually recommended for prostate cancers that recur following surgery or for advanced stage prostate cancer. Radiation can also often cause side effects of incontinence and impotence.

**Hormones**

Hormone therapy is a prostate cancer treatment that is designed to keep cancers from growing. It works by reducing the amount of male hormones (testosterone) in the body or by blocking the way these hormones work. Side effects often include impotence, loss of sexual desire, hot flashes, and loss of muscle mass, but these can lessen over time. Hormone therapy is often recommended for men undergoing radiation prostate cancer treatment, and in men with metastatic prostate cancer. It is not a treatment recommended for most men with early stage prostate cancer.

**Ablation**

Ablation therapy is a prostate cancer treatment that uses energy to destroy an area of cancerous tissue. Whole gland ablation treats the entire prostate, and focal ablation targets areas of clinically-significant cancer in the prostate. Energy sources that are approved for use in the US for tissue ablation include cryoablation (freezing) and laser ablation.

**High-intensity focused ultrasound (HIFU)** is another ablation treatment method that uses high-energy sound waves to create sufficient heat to destroy cancerous prostate tissue. The treatment may be used on the entire prostate (whole gland therapy) or a specific area (focal therapy). In 2014, a U.S. Food & Drug Administration (FDA) panel rejected an application for approval to use HIFU for prostate cancer treatment in this country. The following year, when a clinical trial demonstrated acceptable short term cancer control and side effect rates for treating radiation failure, the FDA issued a “more limited ‘de novo’ approval that permits use of the technology for treating prostate tissue in general without specific mention of its use for treating prostate cancer.” (Harvard Medical School, 2016 Annual Report on Prostate Cancer) Although HIFU has been used in other countries (Europe, China, Japan, Latin America, etc.) for over a decade, there is no long term U.S. data on its effectiveness or side effects.
Limitations of HIFU include:

- Ultrasound imaging guidance gives less treatment precision than MRI-guided treatments
- Inability to apply HIFU if calcifications are present in the prostate gland or the gland is larger than normal
- A TURP (“reaming out”) of the gland may be needed prior to HIFU treatment
- Unable to use MRI thermography information to confirm the zone of destruction by depicting real-time temperature changes in tissue
- Relatively high rate of side effects and cancer recurrence

**Focal laser ablation** is an innovative, new FDA approved procedure that has great potential for destroying cancer cells while avoiding the incontinence, impotence, and other side effects associated with traditional prostate cancer treatment. And unlike surgery and radiation, focal laser ablation is a repeatable procedure that can be performed again should cancer recur.

**Focal Laser Ablation at the Sperling Prostate Center**

At the Sperling Prostate Center, focal laser ablation is combined with mpMRI to deliver the most targeted treatment available today. Dr. Dan Sperling, a pioneer in the field with the most experience in the procedure, uses real-time MRI to see the tumor and place the laser fiber. The tumor is then destroyed while protecting a margin of healthy tissue. This preserves urinary and sexual function in patients undergoing the procedure.

Unlike prostatectomy surgery, the procedure requires no anesthesia, and typically takes about an hour in most cases. Men undergoing focal laser ablation head home the same day without a urinary catheter. And they are back to normal, or pre-treatment, activity levels within a day or two.

A comprehensive post-treatment follow-up plan is also created to monitor the recovery and progress of each patient. This involves periodic mpMRI imaging and lab tests.
FOR MORE INFORMATION

Interested in learning more about mpMRI for prostate cancer detection, mpMRI-guided biopsy, or focal laser ablation? Dr. Dan Sperling, founder of The Sperling Prostate Center, is an authority in the use of these procedures. Contact our state-of-the-art New York facility at 877-958-3847 for more information and a consultation today.

Additional Prostate Cancer Resources

The following organizations offer more information and support for prostate cancer patients and their loved ones:

American Cancer Society (ACS)
www.cancer.org
1-800-227-2345

CancerCare
www.cancercare.org
1-800-813-HOPE (1-800-813-4673)

National Cancer Institute
www.cancer.gov/prostate
1-800-4-CANCER (1-800-422-6237)

Prostate Cancer Foundation
www.pcf.org
1-800-757-CURE (1-800-757-2873)

Sperling Prostate Center
www.sperlingprostatecenter.com
1-877-958-3847

The Urology Care Foundation
www.urologyhealth.org
1-800-828-7866
US TOO: Prostate Cancer Education and Support Network
www.ustoo.com
1-800-80-UsTOO (1-800-808-7866)

Zero: The Project to End Prostate Cancer
www.zerocancer.org
1-888-245-9455

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