# Understanding Prostate Cancer

## The Urology Group Guide for Newly Diagnosed Patients

The Urology Group
Advanced Care. Improving Lives.

# UNDERSTANDING PROSTATE CANCER

The Urology Group has created this publication to provide information and support for patients with newly diagnosed prostate cancer. The Urology Group believes that patients and their loved ones need to be well informed to work as effective partners with their health care providers – and to optimize the benefits of treatment.

The Urology Group is one of the largest independent groups of urologists in the country and serves as the Cincinnati/Northern Kentucky region's premier resource in this specialty. Our goal is to provide the most advanced urologic care to improve the lives of our patients, which we accomplish through industry leading technology and personalized service.

Our physicians understand the stress that can accompany the treatment process and as medical professionals we:

- Maintain patient care as our primary responsibility
- Foster respect for the individual
- Continuously seek advanced care options for our patients

Treatments are performed by our skilled physicians, nurse practitioners, nurses and technicians, using state-of-the-art equipment, for your care and peace of mind. We hope this booklet serves as a helpful resource. To download a digital version, please visit www.urologygroup.com.

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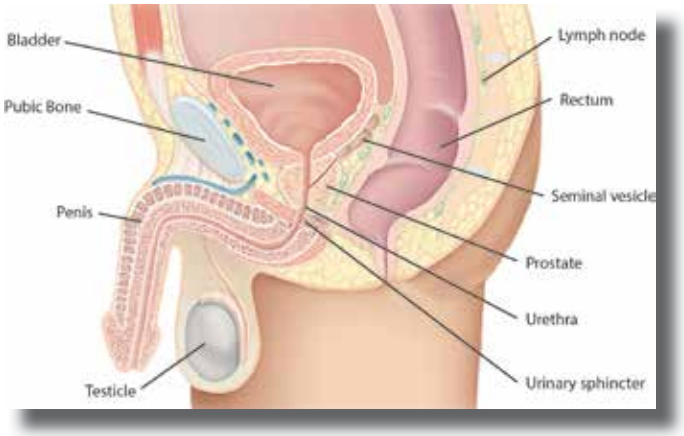
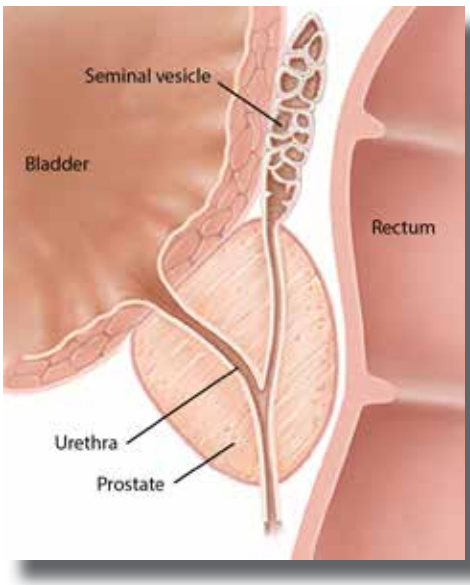
# What is the Prostate?

- Basic Overview of the Male Reproductive System

The prostate is a gland found only in men and is part of the male reproductive system. It is located within the pelvis, below the urinary bladder and in front of the rectum. The urethra, which is the tube that carries urine and semen out of the body, goes through the center of the prostate. There is an abundant nerve supply surrounding the prostate. These nerves contribute to a man's ability to have an erection. Located on either side of the uppermost part of the prostate and at the base of the bladder are the seminal vesicles. The seminal vesicles are a pair of glands, about 2-3 inches long, that are part of the male reproductive system. The seminal vesicles secrete fluid to help make semen.



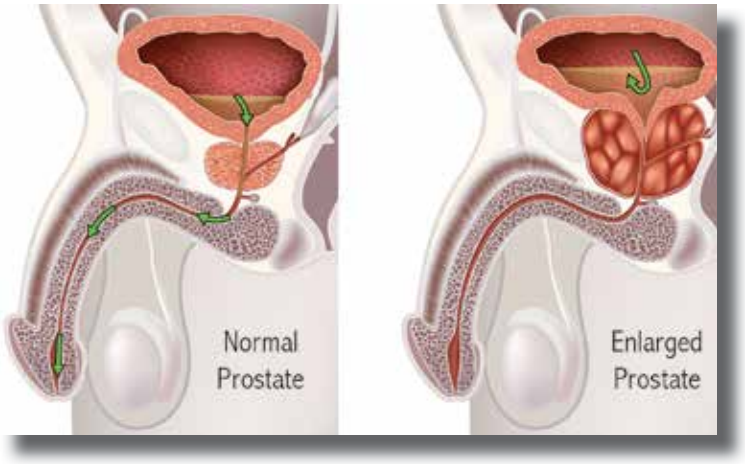

The size of the prostate varies with age. In young men, it is typically the size and shape of a walnut, but as men age the prostate often becomes larger. The function of the prostate is to produce a fluid which contributes to the formation of semen. Sperm, from the testes, is mixed with the fluids from the prostate and the seminal vesicles to help support and nourish the sperm so that they can live for a period of time after ejaculation.

# Changes in the Prostate

- Benign Prostatic Hypertrophy (BPH)
- High Grade Prostatic Intraepithelial Neoplasia (PIN)
- Atypical Glands
- Cancer

## Benign Prostatic Hypertrophy (BPH)

As men age, the prostate may become enlarged, a condition known as benign prostatic hypertrophy (BPH). BPH is a noncancerous growth of the prostate. BPH may cause problems with urination as the prostate growth compresses the urethra. BPH may be treated with medicines that shrink the size of the prostate or help the prostate relax, to help improve urinary flow. If medicines do not relieve the urinary symptoms, a procedure called a transurethral resection of the prostate (TURP) may be performed. A TURP is a type of endoscopic surgical procedure (done without an incision, via a "scope" inserted into the urethra) which removes the prostate tissue surrounding the urethra to allow ease of the flow of urine. This is a procedure that effectively helps urinary symptoms of BPH, but is not a treatment for cancer.




## High Grade Prostatic Intraepithelial Neoplasia (PIN)

There are pre-cancerous cells that can develop in the prostate called prostatic intraepithelial neoplasia (PIN). PIN cells are occasionally noted in prostate biopsy specimens. They appear abnormal, but they are not cancer. Their presence in the prostate is an indication that cancer could develop in the future. If the amount of high grade PIN in the biopsy is significant, a repeat prostate biopsy is sometimes warranted.

# Atypical Glands

Atypical glands may also be found on a prostate biopsy. Like high grade PIN, these cells are not truly cancers. They are, however, a more concerning finding than high grade PIN. Patients who do not have prostate cancer on a prostate biopsy, but who have atypical glands, usually require re-biopsy and should be closely monitored in the future.

# Cancer

Cancerous tumors (malignant tumors) can also develop within the prostate. Cancer begins when cells start to grow out of control. Cancer cell growth is different from normal cell growth. Instead of dying, abnormal cancer cells may continue to grow. Some malignant tumors of the prostate can be felt during a physical exam (digital rectal exam, see p. 9), while others cannot. Cancer cells can grow into (invade) other nearby tissues. Cancer cells can also travel to other parts of the body, through the bloodstream and lymph vessels, where they can grow and form new tumors at distant sites. This process is called metastasis, and tumors that form at distant sites away from the original location are called metastatic tumors. When prostate cancer cells metastasize, they most often spread to the pelvic lymph nodes or bones. For example, if prostate cancer spreads to the bones, it is known as "metastatic prostate cancer to the bone" rather than bone cancer ("bone cancer" would imply a different type of cancer).

Very small - confined | Larger - confined | Starting to break through

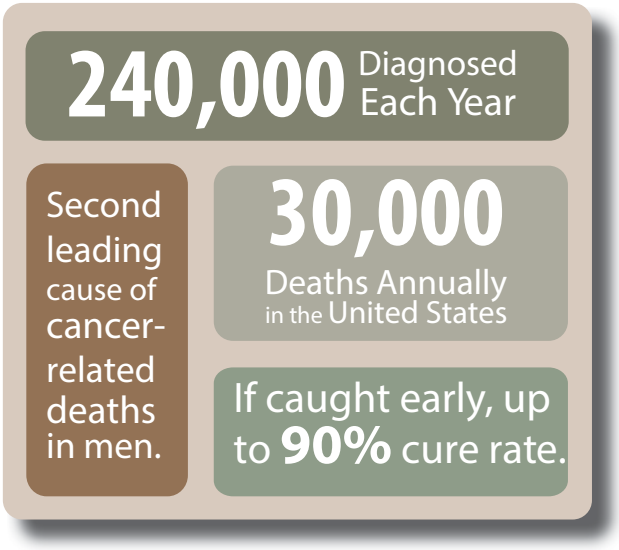
The term "adenocarcinoma" is usually present on a prostate biopsy report. Adenocarcinoma in general is the most common type of cancer that originates in glandular tissue. Prostate adenocarcinoma is cancer that starts in the prostate gland and accounts for 95% of all prostate cancers.

# Prostate Cancer Statistics

- Key Statistics About Prostate Cancer
- Risk Factors

## Key Statistics About Prostate Cancer

Other than skin cancer, prostate cancer is the most common cancer diagnosed in men in the United States. Approximately 240,000 new cases of prostate cancer are diagnosed annually in the United States. About 1 man in 6 will be diagnosed with prostate cancer during his lifetime. Prostate cancer mainly occurs in older men and the average age at the time of diagnosis is 67, however prostate cancer can rarely be diagnosed in men as young as their late 30s. While many men with prostate cancer can have slow progression of their disease and die of other causes, other men may unfortunately die of prostate cancer. Prostate cancer is still the second leading cause of cancer-related deaths in men, second only to lung cancer. About 30,000 men die of prostate cancer annually in the United States.




## Risk Factors for Prostate Cancer

A risk factor is anything that affects your chance of getting a disease, such as cancer. Age is a risk factor for prostate cancer. Prostate cancer is very rare in men younger than 40, but the chance of having prostate cancer increases after the age of 50.

Prostate cancer also occurs more often in African-American men than men of other races. It is less common in Asian/Pacific Islander and American Indian/Alaskan Native men.

Family history plays a role in prostate cancer. Having a father or brother with prostate cancer more than doubles a man's risk of developing prostate cancer. The risk is higher in men who have multiple family members with the disease.

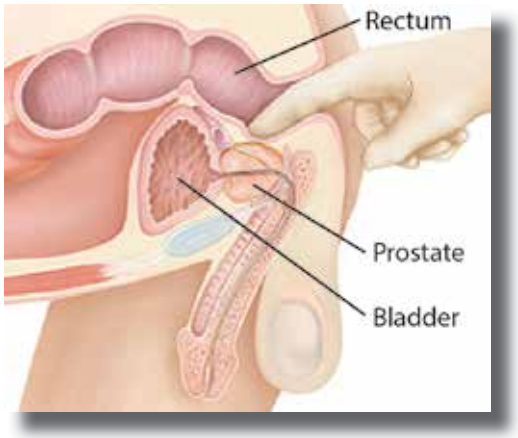
Studies have shown that obesity (very overweight) is associated with a higher risk of prostate cancer. Diet appears to play a role in prostate cancer, but the exact reasons are not clear. Men who eat a diet with excessive red meat or high-fat dairy products may have a slightly higher risk for developing prostate cancer. These men tend to eat fewer fruits and vegetables, which also may play a role. A diet rich in fiber, fruits and vegetables and low in red meats may promote a lower risk of developing prostate cancer.

# Diagnosing Prostate Cancer

- Medical History & Physical Exam
- The PSA Blood Test
- Prostate Biopsy & Gleason Score
- Imaging Tests

## Medical History & Physical Exam

To find out more about your prostate, your healthcare team will ask you about your family and medical history and will perform a physical exam. In order to feel the prostate, your doctor will perform a digital rectal exam (DRE). The doctor will insert a lubricated gloved finger into the rectum to feel the back wall of the prostate gland. The doctor is feeling for any abnormal changes, such as hard nodules or irregularities. Most prostate cancers cannot be felt by a DRE. Many cancers are too small to be felt and some cancers may not be located near the back wall of the prostate, where the physician is feeling. If the doctor feels an abnormality, this does not automatically mean cancer. However, it does indicate that a biopsy of the prostate is needed. The DRE exam, although not perfect and slightly uncomfortable, is an important test in helping detect prostate cancer and takes well under a minute to perform.




## The PSA Blood Test

Prostate specific antigen (PSA) is a protein made by prostate cells. In healthy men, this protein has a role in the normal functioning of the semen. Both noncancerous and cancerous prostate cells make PSA, and some PSA is excreted into the bloodstream. A PSA test measures the amount of PSA in the blood. It is used as a screening test for prostate cancer because men with prostate cancer usually have high PSA levels. However, the PSA test is not perfect – high levels do not always mean cancer and normal PSA levels do not always mean a cancer is not present. High levels of PSA can be found in men with cancer, but also in men without cancer who have an enlarged prostate (BPH), or an infection of the prostate (prostatitis). While the PSA blood test is not perfect, it, combined with the digital rectal exam, remains the best way to detect prostate cancer.

Once prostate cancer has been detected, PSA is an important test in helping determine the prognosis for cure (see definition of Risk Groups, p. 15), and in monitoring the success of cancer treatments. PSA levels will be measured at regular intervals after treatment. In general, PSA levels will be low after successful treatment for prostate cancer. However sometimes PSA levels can fluctuate after treatment, and an increase in PSA does not necessarily mean the treatment has failed.

There has been recent discussion in the public and media about the use of the PSA test to screen for the detection of prostate cancer. This stems from the fact that all men with an elevated PSA do not have prostate cancer, and the fact that all men found to have prostate cancer may not require immediate curative therapy. Nevertheless, we believe strongly that the PSA is a critical screening test when used properly. Because many men with an elevated PSA may not have prostate cancer, we often recommend repeating PSA levels or establishing PSA trends before recommending prostate biopsy. In addition, we advocate a program of observation for some men who are found to have early slow growing prostate cancer on their prostate biopsy (active surveillance – see p. 17), rather than immediate curative treatment. Unfortunately, however, many men in our community do unknowingly harbor significant prostate cancer which needs treatment. Not using the PSA at all to screen for prostate cancer is like "burying your head in the sand," and is likely to do the public harm by leading to under detection of significant prostate cancers. At this time we have no more accurate screening test for prostate cancer. The use of the PSA test has led to a 75% decrease in the number of men presenting with advanced prostate cancer, and a 40% reduction in the death rate from prostate cancer in the United States over the past 20 years.

**The use of the PSA Test has led to a 75% decrease in the number of men presenting with advanced prostate cancer. Over the past 20 years PSA Testing has led to a 40% reduction in the death rate from prostate cancer in America.**

It is important to understand that once prostate cancer is detected, measuring PSA levels is extremely valuable in helping plan appropriate prostate cancer treatment, and in monitoring the response to treatments. The controversies surrounding PSA testing for screening, discussed above, are not applicable with respect to the usefulness of the PSA test for planning and monitoring treatment once prostate cancer has been detected.

# Prostate Biospy & Gleason Score

A prostate biopsy is a procedure during which the urologist obtains tissue samples from the prostate gland. An ultrasound probe is inserted into the rectum to image the prostate, then a thin needle is inserted into the prostate through the ultrasound probe to obtain the tissue samples. Typically, about 12 prostate samples are obtained during the biopsy session. After the prostate tissue is removed, it is examined under a microscope by a pathologist (a doctor who specializes in identifying diseases by examining cells and tissues).

The pathologist will look at the characteristics of the cancer cells (their size, shape, and pattern of growth) and will assign what is termed a "Gleason score." The Gleason score is a standardized scoring system to describe the aggressiveness of the cancer cells and is used to predict prognosis and guide therapy. The Gleason score was created in the 1960s by Dr. Donald Gleason, a pathologist who specialized in the field of prostate cancer. Dr. Gleason observed that some prostate cancer cells look similar to normal cells under a microscope and tend to grow and spread slowly (least aggressive). Other prostate cancer cells look least similar to normal cells and grow and spread quickly (most aggressive). The Gleason score ranges from 2 (least aggressive) to 10 (most aggressive) and is based on prostate cancer cells' microscopic appearance. Cancers with a low Gleason score tend to grow and spread more slowly. Cancers with a high Gleason score tend to grow and spread more quickly. For technical reasons, Gleason scores less than 6 are not generally reported on prostate biopsies. Therefore, a Gleason score of 6 is the least aggressive form of cancer that is diagnosed by prostate biopsy, whereas a score of 10 is the most aggressive form.

It is important to understand that the Gleason score differs from tumor stage. The Gleason score is a description of the aggressiveness of the cancer cells (the term "grade" is often used to describe the aggressiveness of cancer; the Gleason score is the method used to describe the "grade" of a prostate cancer) and is assigned based on the microscopic appearance of the cancer cells. The tumor stage, however, describes how the cancer was detected (see p. 14), and the extent of the cancer in the body. The tumor stage will not be indicated on a prostate biopsy report, but will be described by your doctor. Both the Gleason score and tumor stage are used together to predict prognosis and help guide therapy.

> The Gleason score is a standardized system to describe the aggressiveness of cancer cells.

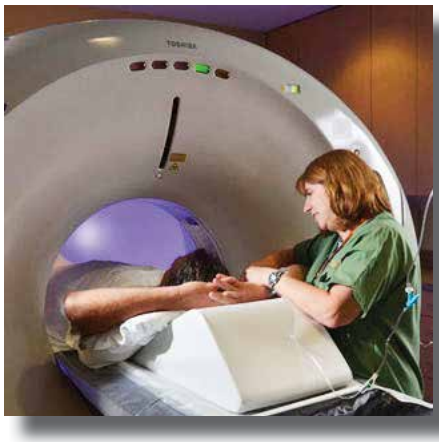
Factors other than the Gleason score may be described in a prostate biopsy report. The number of biopsy cores positive for cancer and the percent of cancer in each core may be indicated on the biopsy report. In general, the more cancer detected, the greater the risk of the cancer spreading. These factors provide useful information to your doctor when determining if further diagnostic tests are needed, the likely extent of the cancer, and treatment options.

The biopsy report may also describe "perineural invasion." Perineural invasion means that the cancer is growing into small nerves inside the prostate. These are not the nerves outside the prostate that control erections. Perineural invasion may be an indication that the cancer is more aggressive. This is sometimes taken into consideration when deciding treatment options to be considered.

# Imaging Tests

Based on the initial diagnostic findings (PSA, DRE, Gleason score), your physician will determine if further imaging tests are needed. Several imaging tests are available to help determine whether cancer is outside of the prostate, but none is perfect. All may miss microscopic amounts of cancer that have spread beyond the prostate.

Many men diagnosed with prostate cancer have such a small chance of cancer being detectable outside of the prostate (men with low-risk disease, see p. 15) that they do not need any imaging tests after prostate cancer has been diagnosed on biopsy.

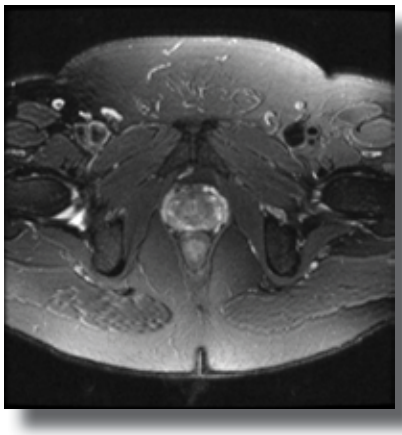


## CT Scan:

A computed tomography (CT) scan is used to identify soft tissues, organs and bones. CT scans are used to determine if cancer has spread outside of the prostate, particularly to lymph nodes. Not all patients are asked to have a CT scan done. As noted above, patients that are low-risk with slow-growing prostate cancers do not undergo a diagnostic CT scan.

In contradistinction to a diagnostic CT scan, patients who undergo various forms of radiation therapy will undergo CT scans for treatment planning purposes. In this setting, a CT scan is done prior to the radiation treatment to identify the prostate and neighboring normal structures (bladder, rectum) to ensure that the prostate is being targeted appropriately and that the adjacent structures are being avoided. This type of CT scan helps create a customized treatment plan for each patient. These treatment planning CT scans are not performed with the intent of localizing the cancer.

## Magnetic Resonance Imaging (MRI):



Magnetic resonance imaging (MRI) uses strong magnets to create images of soft tissue in the body. MRI is sometimes used to look for cancer that has spread through the edge of the prostate. Not all patients are asked to have an MRI done for this purpose.

As with CT scanning, MRI is also used for radiation treatment planning. Patients that undergo CyberKnife SBRT (see p. 20) will undergo an MRI as well as a CT scan to optimally identify the boundaries of the prostate and neighboring normal structures (bladder, rectum, nerves). These images are used to map the location of these structures and help create a treatment plan.

## Bone Scan:

A bone scan is used to identify cancer that has spread to the bones. Not all patients are asked to have a bone scan done. Typically, patients that are low risk and have slow-growing tumors do not undergo a bone scan.

# Staging Prostate Cancer

- TNM Staging System
- Risk Groups
- Other Factors to Consider When Determining Treatment Options

One of the most important parts of treating cancer is to determine how far the cancer has spread or what stage the cancer is. Stage is an assessment of where cancer is in the body, whether it is in the prostate, lymph nodes or other areas. Staging will help you and your physician determine which treatment options are best for you.

At the time of diagnosis your physician and will determine the "clinical" stage (a "pathological" stage is determined by a pathologist after the prostate is removed in those patients who undergo surgical removal of the prostate). The results of the DRE, and the circumstances which led to the cancer being detected, as well as other imaging tests when indicated, are considered when the stage is determined.

> Stage is an assessment of where cancer is in the body, whether it is in the prostate, lymph nodes or other areas.

## TNM Staging System

Physicians use a standardized method to stage cancers. The most widely used staging method for prostate cancer is the American Joint Committee on Cancer (AJCC) TNM system. The TNM system is based on three parts: T, N and M.

T – describes the primary tumor; including the size, extent, penetration (depth) of the tumor
N – involvement of lymph nodes
M – presence of distant metastasis (spread of cancer to other parts of the body)

The following chart provides definitions of the clinical TNM stage (AJCC TNM, Edition 7).

## T Categories

| | |
|---|---|
| **T1**<br>The cancer cannot be felt during the digital rectal exam (DRE) | **T1a** – The cancer was found incidentally (not suspected) during a surgery for prostate enlargement (TURP, see p. 5). The amount of tumor present in the tissue sample is no more than 5%. |
| | **T1b** – The cancer was found incidentally (not suspected) during a surgery for prostate enlargement (TURP, see p. 5) and the amount of tumor present in the tissue sample is more than 5%. |
| | **T1c** – Cancer cells found in a needle biopsy of the prostate that was prompted by an elevated PSA level. PSA elevation is the most common reason cancer is detected. Stage T1c is the most common stage that is diagnosed. |
| **T2**<br>The cancer can be felt on the digital rectal exam (DRE) | **T2a** –The cancer is felt in no more than one half of only one side (right or left) of the prostate. |
| | **T2b** – The cancer is felt in more than one half of one side (right or left) but not in both sides. |
| | **T2c** – The cancer is felt in both sides of the prostate. |
| **T3**<br>The cancer has started to grow outside of the prostate | **T3a** – The cancer has spread through the prostate capsule. |
| | **T3b** – The cancer has spread into the seminal vesicles. |
| **T4**<br>The cancer has spread outside of the prostate into adjacent structures other than the seminal vesicles, such as the urethral sphincter (muscle that helps control urination), bladder, rectum, and/or pelvic wall. | |

## N Categories

| |
|---|
| **N0** – The cancer has not spread to the lymph nodes within the pelvis. |
| **N1** – The cancer has spread into one or more of the lymph nodes in the pelvis. |

## M Categories

| |
|---|
| **M0** – The cancer has not spread to distant sites. |
| **M1** – The cancer has spread to other areas in the body (distant metastasis), most commonly bone. |

# Risk Groups

The T stage is often just a description of how the prostate cancer was detected. For example, patients with PSA elevations, and without an abnormality on DRE, are all classified as T1c. Patients with abnormalities on DRE are classified as T2. However, these T stage descriptions do not incorporate other important prognostic factors such as the aggressiveness of the cancer cells (Gleason score) or how high the PSA level is at the time of diagnosis. All of these factors are important determinants in a man's prospects for cure. In order to better describe the prognosis of a man with newly diagnosed prostate cancer it is increasingly common to combine the T stage with the Gleason score and PSA in order to assign a "risk group" for that patient.

There are three risk group categories--low, intermediate, and high--that are defined by PSA, Gleason score, clinical stage and sometimes other diagnostic findings. Low-risk indicates that the cancer is most likely contained within the prostate and that there is "low-risk" of treatment failure. Low-risk patients usually do well with a single therapy such as surgery, external beam radiation therapy (IMRT or CyberKnife SBRT) or brachytherapy (also called "seed implantation"). High-risk disease means there is a higher chance that cancer cells have spread outside the prostate. Combination therapy, the use of more than one therapy, is often indicated for patients with high-risk disease. Intermediate-risk falls between low- and high-risk groupings and single or combination therapy may be offered depending on the patient's unique set of circumstances. Your doctor will assign you a risk group. Various risk group criteria exist. One common risk group system is described below:

**Low-risk** patients are defined as those with any stage up to (and including) T2a, with a PSA of 10 or less, and a Gleason score of 6 or less.

**Intermediate-risk** patients are those patients with up to (and including) stage T2b, with a PSA over 10 or a Gleason score of 7 or higher.

**High-risk** patients are those with up to (and including) stage T2c as well as a PSA over 10 and a Gleason score of 7 or above.

| **Variable** | **Your Score** |
|---|---|
| PSA | |
| Gleason Score | |
| T Stage | |
| **Risk Group** | **Ask Your Doctor** |

# Other Factors to Consider When Determining Treatment Options

Studies have shown that various factors in addition to the T stage, Gleason score and PSA may influence treatment success. Some of these include the number of biopsy cores positive for cancer in the biopsy specimen, the presence of perineural invasion in the biopsy, or the presence of a large amount of cancer in any given single core from the biopsy specimen. Your doctor may use this information to inform treatment decisions.

# Prostate Cancer Treatment

- Active Surveillance
- Surgical Therapy
- Radiation Therapy
- Hormone Therapy
- Combination Therapies
- Other Treatments

The primary management options for clinically localized prostate cancer include active surveillance (deciding not to treat the cancer immediately), surgery to remove the prostate, and various forms of radiation therapy which target the prostate. Unlike some other cancers, chemotherapy is not used in patients with localized prostate cancer.

Every patient is different, and what is "best" for one man may not be "best" for another.

Surgery and radiation therapy are both intended to cure the prostate cancer. There are no studies which definitively prove that either of these treatment approaches is necessarily better than the other to cure prostate cancer. This is sometimes frustrating for patients and their families because often patients ask "What is the best treatment?" Every patient is different and what is "best" for one man may not be "best" for another. There are many factors to consider when deciding which treatment to choose for your prostate cancer. These decisions should be made in conjunction your doctors, which include urologists and radiation oncologists, and you may wish to talk with your primary care physician, family, and friends as well.

As you consider which treatment may be best for you, it is important to understand potential treatment-related side effects. In general, treating prostate cancer can lead to urinary, sexual, and bowel side effects. This is because of where the prostate is located in the body. As discussed on p. 4, the prostate sits below the bladder, and in front of the rectum. The urethra runs through the center of the prostate, and the nerves that control erections run along the side of the prostate. Because of the close proximity of the bladder, rectum, urethra, and erectile nerves to the prostate, treatment of the prostate to eliminate cancer may affect these structures and result in side effects. Various treatment methods may have different side effects. During your treatment decision process, it is important to understand the potential side effects and how they may impact your quality of life.

An overview of prostate cancer treatments provided by The Urology Group, along with potential treatment-related side effects, are described on the following pages.

# Active Surveillance

Active surveillance is a decision not to treat prostate cancer at the time of diagnosis. Active surveillance may be used in a couple of very different clinical settings.

First, some men diagnosed with prostate cancer may be quite elderly, or in frail overall health. A basic tenet of prostate cancer treatment is that men who do not have a ten year life expectancy, either due to age or poor overall health, may not need treatments such as surgery or radiation therapy at all. These patients may simply be observed. In this setting, the urologist will follow the patient's PSA level and overall health periodically. If the patient has been deemed a poor candidate for potentially curative treatment based on age or health, and the cancer progresses, it is common to employ hormone therapy (see p. 26), which is almost always effective at slowing the growth of prostate cancer.

Today, there is another very different setting when active surveillance may be employed. Recent research indicates that immediate prostate cancer treatment may be deferred for a subgroup of healthy men with very low-risk prostate cancer. While experts differ as to who exactly may qualify for this form of active surveillance, most authorities suggest that it is appropriate for men with no more than one or two positive biopsies of Gleason 6 cancer, as long as there is not too much cancer in the positive biopsy core(s). Since these cancers are small and slow growing, it is believed that these men are generally at low risk for spread of cancer while under active surveillance. Men may choose active surveillance as opposed to treatment in order to avoid the inconveniences and potential side effects of treatment.

A critical element of active surveillance for healthy men with very low risk prostate cancer is appropriate long-term follow-up, particularly follow-up prostate biopsies.

A critical element of active surveillance for healthy men with very low-risk prostate cancer is appropriate long-term follow-up, particularly follow-up prostate biopsies. Relying on follow-up PSAs alone (without biopsies) is not enough. If you pursue a course of active surveillance, your urologist will advise you as to the timing of follow-up PSA testing and prostate biopsies. About 25% of healthy men with very low risk prostate cancer who qualify for and pursue active surveillance will eventually require treatment due to cancer growth, as determined by their follow up PSA and prostate biopsy results.

# Surgical Therapy

Surgical treatment and removal of prostate cancer has undergone significant improvements over recent years. Initially, prostate cancer was removed through an incision between the scrotum and rectum (perineal approach), or by an abdominal incision from the umbilicus (belly button) to the pubic bone (retropubic approach). A less invasive laparoscopic approach was then developed that utilized small "puncture type" incisions for the removal of the prostate. The most recent state-of-the-art development in minimally invasive prostate cancer surgery is the da Vinci® robotic-assisted radical prostatectomy. The Urology Group is by far our region's leader in da Vinci robotic-assisted radical prostatectomy.

The da Vinci Prostatectomy is a robotically-assisted laparoscopic surgery to remove the prostate and seminal vesicles with the purpose of rendering a surgical cure for prostate cancer. Small incisions (the size of a dime) are created in the lower abdomen through which a specialized high definition camera and robotic instruments are placed. The surgeon visualizes the prostate and internal tissues through the high definition camera and controls the precise surgical instruments using a computer, which replicates the surgeon's every motion. At the heart of this technology is the ability of the surgical instruments to be "wristed" – articulating motion of the surgical instruments in seven planes of motion, replicating to a very precise level the articulation of the human wrist. This allows the surgeon to operate with high-definition vision using precise instrumentation through very small, minimal incisions.

The benefits of the da Vinci Prostatectomy include smaller incisions, high definition visualization of the tissues, robotic surgical precision and instrumentation, decreased blood loss (with a minimal risk of blood transfusion during surgery). Additionally, studies have shown the da Vinci Prostatectomy reduces side effects, hospital stay, post-operative discomfort, use of pain medication and the time to return to normal activities when compared to open surgery. Candidates suitable for da Vinci Prostatectomy include patients with cancer confined to or extending just beyond the prostate, who are healthy enough to undergo anesthesia and a surgical procedure.

The average length of robotic prostatectomy is 2-3 hours. During the procedure, the prostate is removed and the bladder is carefully reattached to the urethra. While the patient is under anesthesia, a catheter is inserted through the penis into the bladder in order to allow this area to heal adequately. Patients go home with the catheter which is typically removed in the office in about one week. The majority of patients go home the day after surgery.

During surgery, some of the lymph nodes in the pelvis may be removed. The decision to sample and remove lymph nodes is based on the tumor stage, Gleason score, and PSA. This will be addressed by your surgeon prior to the procedure. Any tissue that is removed at the time of surgery (including the prostate, seminal vesicles, and lymph nodes) are carefully examined by a pathologist. The pathologist will issue a report which will assign a final "pathologic" stage using the AJCC TNM staging system. The pathological stage might help determine if additional treatments are needed.

## Possible Side Effects After Robotic Prostatectomy

As with any surgical procedure, there are risks of bleeding, infection and complications due to the anesthesia. These are rare with the advances made by robotic surgery. Urinary tract infections are rare but can result from the catheter and are treated with antibiotics.

Urinary incontinence (the inability to control urination) and erectile dysfunction are the two most common side effects after prostatectomy. Urinary control usually returns over time, but patients may need to wear pads for a period of time after surgery. To help with this process, patients are instructed in pelvic floor strengthening exercises (called "Kegel exercises"), which they will be asked to perform on a regular basis after the surgery. Performance of these exercises has been shown to improve the time to urinary control. The degree of urinary leakage, and the time it takes to regain control remains variable, but the majority of patients will eventually have no significant urine leakage. The average time to complete control (no pads needed) is two to six months. While urinary incontinence can be an issue after prostatectomy, those patients who suffer from difficulty with urination (weak urinary flow, difficulty emptying the bladder, excessive urination at night) prior to surgery may experience improvement in these symptoms after prostatectomy.

Since the nerves controlling erection function are intimately associated with the prostate, prostate removal will sometimes result in erectile dysfunction. "Nerve-sparing" prostatectomy is a type of robotic prostatectomy in which the prostate is removed with a careful attempt to avoid any injury to the nerves immediately adjacent to the prostate. The ability to perform a nerve sparing procedure is based on several factors, the most important of which are the cancer risk factors – tumor stage, Gleason score, and PSA. When the nerves are spared on one side of the prostate, this is referred to as "unilateral nerve sparing;" sparing the nerves on both sides is referred to as "bilateral nerve sparing." Studies indicate that the majority of men will eventually be able to attain an erection after prostate removal with bilateral nerve sparing techniques. It may take several months or more for erections to return. The Urology Group encourages the use of oral medications (Viagra, Cialis, Levitra) to maintain or regain erectile function after prostate cancer surgery. This process, known as "penile rehabilitation," benefits the vast majority of patients. Other therapies may be added to the medicines as well, and will vary on an individual basis.

You may recall that the prostate and seminal vesicles contribute to the formation of semen. Since prostate cancer surgery involves the removal of both the prostate and the seminal vesicles, men no longer produce semen with sexual activity. Even though semen is absent, men are still able to achieve the sensation of climax with sexual activity.

Bowel side effects are unlikely and not a significant concern after prostatectomy. There is a small chance of rectal injury during surgery due to the proximity of the rectum, but this is very rare.

## Monitoring the Outcome of Robotic Prostatectomy

Within several weeks of surgery, you will have your PSA checked. After prostatectomy, the PSA should decrease to an undetectable level. Long-term cure is established if the PSA stays very low over a period of several years. The follow-up PSA testing schedule thereafter will be determined by your urologist.

# Radiation Therapy

Radiation therapy uses high doses of energy to kill cancer cells, and is delivered to the prostate with the intent to cure the prostate cancer. There are several types of radiation therapy available to treat prostate cancer. Radiation therapy can be delivered from outside the body (external) or inside the body (brachytherapy, also called "seeds"). The different types of radiation therapy offered at The Urology Group are described below.

## Stereotactic Body Radiotherapy (SBRT) Using the CyberKnife® Robotic Radiosurgery System

Stereotactic body radiotherapy (SBRT) is a type of radiation therapy where high doses of radiation are delivered in a small number of treatment sessions, called "fractions." CyberKnife SBRT delivers radiation to the prostate in 5 outpatient treatment sessions over two weeks. The Urology Group is the only provider of CyberKnife SBRT in the Cincinnati/Northern Kentucky area.

The CyberKnife System is a radiation delivery system mounted on a robot. CyberKnife Robotic Radiosurgery is a very accurate way of delivering radiation. The CyberKnife robot delivers pencil thin beams of radiation from potentially thousands of different angles. This allows a high dose of radiation to reach the prostate with great accuracy, while minimizing the radiation exposure to healthy tissues that surround the prostate.

In addition, the CyberKnife is a unique technology that can detect prostate motion during the treatment. The CyberKnife robot continuously corrects the aim of the radiation beam when movement is detected. Since the prostate can move without warning even with respiration, there is an advantage to detecting prostate movement and correcting for it during radiation treatment. Many other forms of external beam radiation therapy do not have this important capability.

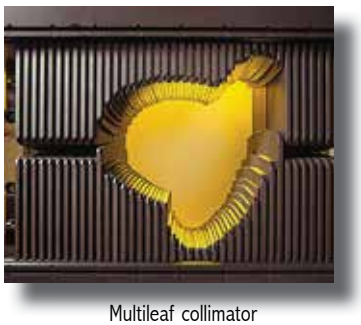
Accurate pencil-thin radiation beams

Finally, research suggests that prostate cancer cells may be more sensitive (more cell killing) to high doses of radiation delivered over a limited period of time, in a fewer number of fractions. This is possible with CyberKnife SBRT vs. other methods of radiation delivery that provide radiation over longer periods of time, and may represent an advantage to CyberKnife SBRT treatment.

### CyberKnife SBRT Procedure:

Prior to CyberKnife SBRT treatment, you will have a few small metallic markers placed in the prostate. These markers are used by the CyberKnife robot to monitor the position of the prostate during each treatment. The markers are inserted during a procedure similar to a prostate biopsy (through the rectum, called "trans-rectal" placement). About one week after the marker placement, you will have both a CT scan and an MRI. The CT and MRI images are then "merged" using specialized software to provide a clear image of the prostate and neighboring normal tissues (urethra, bladder, rectum, and nerve bundles), allowing physicians to create an individualized treatment plan. The treatments are then given in 5 consecutive weekday sessions. Each treatment session will last between 30 and 60 minutes, and treatments are generally painless. No urinary catheter is necessary. On treatment days, patients are typically asked to perform an enema to remove any solid waste from the bowels before the treatment is given.

## Intensity-Modulated Radiation Therapy (IMRT)



Multileaf collimator

Intensity-modulated radiation therapy (IMRT) is a form of external beam radiation therapy which delivers radiation to the prostate in daily outpatient treatment sessions over about 8 weeks.

In contrast to older forms of external beam radiation therapy, IMRT devices are capable of very accurately shaping radiation beams (using a device called a "multileaf collimator") so that the prostate receives high doses of radiation while minimizing the amount of radiation reaching the neighboring normal tissues (bladder, rectum, nerve bundles). The most modern forms of IMRT (such as those we employ at The Urology Group) include daily imaging to identify the location of the prostate prior to each treatment session. When this is done, this is sometimes referred to as image-guided radiation therapy (IGRT). Unlike CyberKnife SBRT, prostate motion during the treatment session is not detected and not corrected for.

Another feature of IMRT is the ability to deliver radiation to larger areas around the prostate and pelvic region. CyberKnife SBRT and seed implantation (see following page) are designed to focus radiation on the prostate and a small surrounding area. The ability to treat larger areas with radiation using IMRT may be important in some patients depending upon the extent of their cancer. Although IMRT may be used by itself, the ability to treat larger areas is one reason why IMRT may also be used in combination with CyberKnife SBRT or seed implantation in patients who are at risk for cancer extension outside of the prostate (combination therapy, see p. 25).

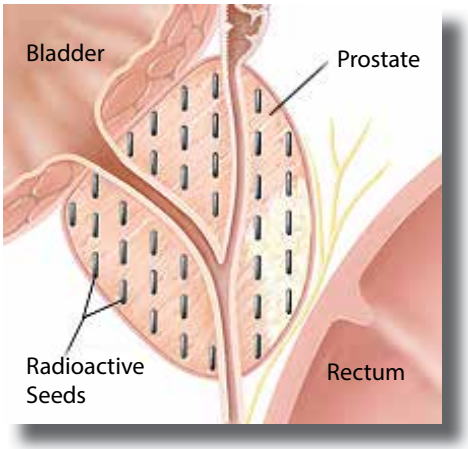
### IMRT Procedure:

Prior to IMRT treatment, you will undergo a treatment planning CT scan. The CT images are used to define the location and size of the prostate and its relationship to the neighboring normal structures. This information is used by your doctors to create a customized treatment plan. Depending upon the circumstances, some patients will also undergo trans-rectal marker placement in the prostate prior to IMRT, as described above. During each IMRT treatment session, the IMRT machine also uses technology to identify the exact location of the prostate (IGRT, as described on previous page). Treatment sessions are delivered daily (Monday – Friday) over about 8 weeks. Treatment sessions will last about 20 to 30 minutes, and are generally painless. No urinary catheter is necessary.

## Brachytherapy ("Seed Implantation")

Brachytherapy is a form of radiation therapy in which radioactive pellets (generally referred to as "seeds") are placed into the prostate gland. At The Urology Center, we have developed a nationally known program in brachytherapy, and have performed by far the most seed implants for prostate cancer in our region.

The word "brachytherapy" means "short therapy," indicating that the radiation is limited to short distances. With seed implantation, radiation is delivered from the inside of the prostate, as opposed to forms of external beam radiation. The seeds are small, about a quarter inch long and the thickness of a pencil lead. At The Urology Group, we use a radioactive isotope of iodine (I-125) as the radiation seed source. I-125 seeds emit half of their radiation by 60 days after implantation. After 6 months, the radiation treatment course is considered to have been delivered. However, the seeds themselves are permanent and are never removed. As compared to CyberKnife SBRT or IMRT, accurate manual placement of the seeds is critical to delivering a proper radiation dose to the prostate while sparing the normal neighboring tissues.




### Brachytherapy Procedure:

Initially, the patient undergoes a planning CT scan. The CT is used to measure the size and shape of the prostate so that the proper number of seeds can be obtained. In addition, some patients with very large prostates or narrow pelvic bones may not be able to undergo the seed implant procedure, and this is generally determined by the treatment planning CT as well.

The prostate seed implant procedure is carried out under general anesthesia at The Urology Center, usually a couple of weeks after the planning CT. During the implant, an ultrasound probe is placed in the rectal cavity. Using ultrasound, along with computer technology available in the operating room, physicians determine the precise array that the seeds are to be implanted. This process is referred to as "intra-operative planning or mapping" and is more accurate than methods used at many other centers to determine seed placement. After mapping is complete, a series of needles, each loaded with one to six seeds, are passed into the prostate through the skin under the patient's scrotum. The seeds are deposited using ultrasound guidance. On average, about 70-100 total seeds are placed using about 16-22 needle insertions.

The seed implant procedure takes about 1 hour and is performed as an outpatient. Patients are discharged from The Urology Center with a catheter in the bladder, and are instructed how to remove the catheter the next morning on their own.

Patients who are required to take blood-thinners must be able to stop those medications one week prior to undergoing seed implantation.

### Possible Side Effects of Radiation Therapy (CyberKnife SBRT, IMRT, Seed Implantation):

The most common side effects after radiation therapy are urinary side effects, erectile dysfunction, and bowel side effects.

Urinary side effects can include increased urinary frequency, some discomfort during urination, increased urgency to urinate, a weaker urinary stream, or a need to get up more at night to urinate. Because their urinary symptoms could worsen, patients with a significant amount of urinary difficulty at the time their prostate cancer is diagnosed, prior to treatment, may not be ideal candidates for radiation therapy. Urinary leakage (incontinence), is generally not a problem after radiation therapy. Urinary side effects typically resolve on their own after a few weeks or months. In a low percentage of patients, urinary symptoms could persist for longer periods of time. Medications can be used if needed to treat these symptoms.

Urinary side effects described above are usually less after CyberKnife SBRT or IMRT therapy than after seed implantation. Seed implantation involves needle placement in the prostate whereas these other methods of radiation do not. In addition, the period of active radiation dose delivery is longer with seed implantation than CyberKnife SBRT or IMRT, which can sometimes result in a longer period of urinary side effects.

Erectile dysfunction is a potential side effect after radiation therapy. While not everyone who receives radiation therapy develops erectile dysfunction, radiation may affect the man's ability to have erections because it can cause narrowing of the arteries that carry blood to the penis. When erectile dysfunction occurs after radiation therapy, it usually does not occur right away, but rather typically progresses slowly over a period of a year or more. Even if erectile dysfunction occurs after radiation therapy, medication and other treatments are available to facilitate a man's return to sexual activity.

You may recall that the prostate and seminal vesicles contribute to the formation of semen. Because radiation therapy is designed to eliminate much of the prostate tissue (including the cancer), some men may experience

a reduction or even elimination of their semen volume after radiation treatment. Even if semen fluid is diminished or absent, men are still able to achieve the sensation of climax with sexual activity.

Bowel side effects can occur in patients who have undergone any form of radiation therapy for prostate cancer. Because of the close proximity of the prostate to the rectum, small amounts of radiation may be delivered to the bowel wall, causing bowel irritation. Patients may develop more frequent bowel movements, or a sensation to move the bowels more quickly. Like the urinary side effects, these bowel side effects generally resolve on their own after a few weeks or months. Medications can be used if needed to treat these symptoms. It is uncommon for bowel irritation from radiation therapy to be a long term problem. Infrequently, patients may develop some blood in the stool even up to a few years after treatment. If this occurs, this usually resolves on its own.

Any form of prostate cancer treatment may cause some patients to be more tired than usual for a time. This is true after surgery when patients are recovering. Radiation therapy may also cause some fatigue. This will resolve after a few weeks if it occurs.

Patients often wonder if they will be "sick" after radiation therapy. This is not the case, as sides effects such as hair loss, nausea, excessive fatigue, and other ill effects (often associated with chemotherapy) are not observed after radiation therapy.

Finally, a particular feature of seed implantation is the need for some minor precautionary measures regarding potential radiation exposure to others. It is safe for men to sleep in the same bed as their wives after seed implantation. However, infants, babies, young children, and pregnant women should be asked to remain a few feet away from the patient for 2 months after seed implantation. A condom should be used with sexual intercourse for 2 months after seed implantation as well. These precautions are not necessary with CyberKnife SBRT or IMRT, since these treatments to not involve the implantation of active radiation sources into the patient.

### Monitoring the outcome of radiation therapy:

After completing radiation therapy, treatment is monitored by measuring PSA levels. Because the prostate is not removed during radiation therapy, PSA levels will not decrease immediately. Typically, PSA levels will gradually decrease until they reach their lowest level (called a "nadir level") which may take up to a couple of years. Similar to surgery, long-term cure is established if the PSA remains low over a period of several years. Your doctor will determine your PSA testing schedule.

# Hormone Therapy

The growth and survival of prostate cancer cells is promoted by the presence of testosterone. Testosterone is made in the male testicle. The use of medications to block the production or action of testosterone is referred to as "hormone therapy." When prostate cancer cells are denied testosterone, some of the cancer cells die and others become dormant.

Hormone therapy is not a cure for prostate cancer, but it can slow the growth of the cancer significantly and allow a man with prostate cancer to experience a "remission." Sometimes this remission can last for years. As a result, some men who are of advanced age, or are in frail health, may be treated with hormone therapy to control their prostate cancer, rather than exposing them to the inconveniences and possible side effects of surgery or radiation therapy. Hormone therapy causes a decline in the PSA that can be monitored by the patient's urologist over time.

Hormone therapy causes a decline in the PSA that can be monitored by the patient's urologist over time.

The use of hormone therapy does have side effects. These commonly include lack of sex drive, erectile dysfunction, weight gain, loss of muscle mass, and hot flashes. Hormone therapy may also lead to some loss of bone strength. Patients undergoing hormone therapy should therefore take calcium and vitamin D supplements. Some patients may be provided prescription medication to promote their bone health as well.

Hormone therapy is usually delivered via periodic injections given in the urologist's office. Depending on the type of medication used, these injections may be given anywhere from once a month to once every 6 months to provide continuous testosterone suppression. In order to minimize the side effects of continuous testosterone suppression (see above), some patients are given hormone injections less frequently ("intermittent hormone therapy"). In these patients, the urologist checks the PSA at regular intervals to determine when the next hormone injection is needed.

# Combination Therapies

**Short Course (4-5 Weeks) IMRT followed by CyberKnife SBRT or Seed Implantation:**

Four to five weeks of daily IMRT treatments followed by CyberKnife SBRT or seed implantation may be recommended for some intermediate- and high-risk patients. CyberKnife SBRT and seed implantation are very good options for delivering high doses of radiation to the prostate and are effective at eliminating cancer cells in the prostate. However, some patients are at higher risk for having developed microscopic cancer outside of the prostate. This microscopic disease is not generally detectable by imaging scans. The addition of IMRT, which is designed to treat a wider area than CyberKnife SBRT or seed implantation alone, can increase the prospects for cure if microscopic extension of cancer has occurred.

IMRT plus CyberKnife SBRT or seed implantation is commonly recommended for high-risk group patients. It may be recommended in select patients with intermediate-risk disease. These decisions will be determined via discussions between the patient, the urologist and the radiation oncologist.

The addition of IMRT prior to CyberKnife SBRT or seed implantation is a more hard-hitting type of treatment than either CyberKnife SBRT or seed implantation alone and as a result may be associated with some increase in the risk of urinary side effects, erectile dysfunction and bowel side effects.

**Hormone therapy plus radiation therapy:**
As described above, the growth and survival of prostate cancer cells is promoted by the presence of testosterone, and the use of medications to block the production or action of testosterone is referred to as "hormone therapy." In addition to causing some prostate cancer cells to die, hormone therapy is thought to render prostate cancer cells more susceptible to the killing effects of radiation therapy. As a result, your doctors may recommend the use of hormone therapy in combination with various forms of radiation therapy. This is most commonly employed in high-risk group patients.

**Surgery followed by 8 Weeks of IMRT:**
As stated previously, patients with high-risk prostate cancer have an increased incidence of microscopic cancer cells outside the prostate. Patients with high-risk prostate cancer may elect to undergo a combination of da Vinci robotic prostatectomy followed by 8 weeks of IMRT. This course of therapy removes the prostate, seminal vesicles, and the bulk of the cancer cells, and follows this with IMRT designed to kill microscopic cancer cells not removed by prostatectomy. The use of IMRT after prostatectomy may be associated with some increase in the risk of urinary side effects, erectile dysfunction and bowel side effects.

## What if surgery or radiation therapy does not cure my prostate cancer?

Both surgery and radiation therapy are highly effective at eliminating prostate cancer. The great majority of patients who undergo treatment will be cured. Unfortunately, however, curing cancer is never guaranteed. Many men are often reassured to know that additional treatments are available if surgery or radiation therapy do not result in cure initially.

In all patients treated for prostate cancer, the urologist will track the patient's PSA after treatment. The PSA test can determine if prostate cancer persists after surgery or radiation therapy, even if the cancer is somewhere else in the body. The PSA usually falls to very low levels within a few weeks after surgical removal of the prostate, and within some months after radiation therapy. While low PSA readings after treatment are very encouraging, long term cure is truly established once the PSA remains low for a number of years.

The PSA test can determine if prostate cancer persists after surgery or radiation therapy, even if the cancer is somewhere else in the body.

If the PSA consistently rises at some time after treatment, the urologist will work with the patient to determine whether cancer persists. This PSA rise is often thought of as a "cancer recurrence," but it is more accurate to state that it is a persistence and progression of the pre-existing cancer cells. The urologist might ask that the patient undergo a bone, CT or other scans to try to identify persistent cancer. After radiation therapy, a follow-up prostate biopsy may be indicated.

Occasionally, it may be determined that the cancer has cropped up in another part of the man's body. In this circumstance, further therapy directed at the area of the

prostate will not result in cure. In this case, hormone therapy and other treatments can be effective in controlling the cancer cells, even though they exist in other parts of the body.

Fortunately, evaluation for persistently rising PSA after treatment usually does not demonstrate that cancer has spread to other parts of the man's body. In this scenario, additional treatment to the area of the prostate may still result in cure. After surgery, radiation therapy may be delivered. The goal of radiation therapy in this setting is to kill cancer cells that may have remained behind in the area of the prostate after it was removed. When radiation therapy is used after prostatectomy, it is always delivered via IMRT technology. Radiation treatment after surgery is generally well tolerated, though it does lead to some increase in the risk of urinary incontinence, erectile dysfunction and bowel side effects.

If cancer persists after radiation therapy additional treatment is also possible. Surgery can be done to remove the prostate after radiation therapy, though in this scenario surgery can be complex and there is a substantial chance of urinary leakage and erectile dysfunction. Other treatments are also possible. Sometimes seeds are implanted to provide additional radiation to kill cancer cells (after CyberKnife SBRT, IMRT or an initial seed implant). Alternatively, cryotherapy (see following page) can be used to kill cancer in the prostate or surrounding tissues. The use of additional radiation or cryotherapy can lead to an increase in the risk of urinary side effects, erectile dysfunction and bowel side effects.

Again, most patients are cured after their initial treatment with surgery or radiation therapy. In general, after the initial diagnosis of prostate cancer it is important for men and their families to maintain a positive attitude and focus on the likely positive outcome of treatment.

Most patients are cured after their initial treatment with surgery or radiation therapy.

# Other Treatments

At The Urology Group, we are the leaders in prostate cancer treatment in our community. The mainstays of prostate cancer treatment are surgery or radiation therapy as described in detail in this section. Often, patients will hear or learn about treatments that are not commonly offered in our community. There are a variety of reasons why some treatments exist that we do not offer. Remember, there is no such thing as a "best treatment" or all centers everywhere would offer just that one option. Some treatments offered elsewhere are redundant; that is, we already offer treatments that we believe are equivalent or superior. Other treatments are not, in our opinion, as desirable as those we offer, either because of the potential for cure or side effects. In this section, we briefly review a few treatments you may hear about, but that we do not offer at The Urology Group.

### Cryotherapy

Cryotherapy, also known as cryosurgery or cryoablation, is a form of therapy in which the prostate tissue is frozen in order to kill the prostate cancer cells. Cryotherapy probes are inserted into the prostate through the skin under the scrotum and the prostate tissue undergoes a freezing and thawing process which is designed to kill the prostate tissue and prostate cancer cells. Cryotherapy is performed under general anesthesia as an outpatient. The procedure takes 1-3 hours to perform.

We believe cryotherapy may be a good option in certain situations such as after radiation therapy, but we do not advocate cryotherapy as first line therapy for localized prostate cancer. First, there are limited studies reporting the long term results of cryotherapy for the initial treatment of localized prostate cancer. Second, cryotherapy (unlike surgical removal or radiation therapy) does not treat the prostate tissue near the urethra, and cancer cells may persist there in some cases. Finally, cryotherapy does not offer a superior side effect profile than surgery or radiation therapy. While all forms of prostate cancer treatment may have side effects as outlined in detail on the previous pages, cryosurgery has a particularly high rate of long term erectile dysfunction, and does not have a superior side effect profile with respect to various urinary and bowel side effects as compared to surgery or radiation therapy.

### Proton therapy

Proton therapy is a form of external beam radiation therapy that uses proton particles to destroy cancer cells, instead of photon energy that is associated with CyberKnife SBRT and IMRT. The principles of cell killing are the same between proton and photon therapy, but there is a difference in how radiation energy is concentrated in the prostate. With photons, energy passes through neighboring normal tissues (bladder, rectum, nerve bundles), but because of the way photon beams can be shaped, or their energy directed from a multitude of angles at the prostate, only the prostate receives high doses of radiation. Protons on the other hand deposit the greatest amount of their energy in the target tissue (the prostate) with little radiation exposure to neighboring tissues. This has led some to theorize that proton energy might lead to less side effects than photon energy. There is, however, no significant evidence that proton therapy results in less side effects than highly advanced forms of external beam photon delivery such as CyberKnife SBRT or IMRT. There is also no evidence that better cure rates are achieved with proton therapy than surgery or photon-based radiation therapy.

There are some disadvantages to proton therapy. The prostate cannot be tracked during treatment, so larger areas around the prostate may need to be treated to account for prostate motion. Proton therapy requires a special facility to generate proton particles and currently there are very few medical centers that deliver proton therapy in the U.S. Treatment is delivered five days a week for eight weeks so patients must relocate to a proton center for a couple of months. Proton therapy is very expensive; proton facilities cost between $100 and $200 million to build, and consequently the cost to treat each patient is very high, much higher than the cost of surgery or other forms of radiation therapy. As a result of the cost of therapy, and the lack of any data to suggest that proton therapy is superior to other therapies, some insurance companies today are beginning to decline to cover proton therapy for prostate cancer. We do not believe that proton therapy will play a major role in the prostate cancer treatment landscape in the future.

### High Intensity Focused Ultrasound (HIFU)

HIFU is an investigational treatment that uses high energy ultrasound waves to generate heat in the prostate to destroy prostate tissue and prostate cancer cells. The high-energy focused ultrasound heats tissue to 195 degrees Fahrenheit for 2-3 seconds, destroying the treated tissue. HIFU is an outpatient procedure performed under anesthesia. The procedure typically takes 1 to 3 hours. A catheter is left in the bladder for 1 to 2 weeks after the procedure.

Currently, HIFU has not received FDA approval for the treatment of prostate cancer in the United States. However, clinical trials to test HIFU for prostate cancer treatment are ongoing. HIFU is used in some countries outside the United States. Without long-term results from the clinical studies, the success of HIFU for the treatment of localized prostate cancer is still not known.

While the ultimate role of HIFU in the U.S. is yet to be determined, it is known that HIFU may be associated with similar side effects as other treatments for prostate cancer, including difficulty urinating, pain in the scrotal and rectal area after treatment, erectile dysfunction, and bowel irritation.

# Nutrition & Lifestyle

- Cardiac Health
- Dietary Supplements

Maintaining a healthy lifestyle, including good nutrition and regular exercise is important for all men and women, young and old. Eating the right kinds of foods before, during and after cancer treatment can help a patient feel better and stay stronger. There are some studies that have shown the benefits of vitamins and nutrients for prostate cancer patients, while other dietary supplements have been shown to have negative effects for prostate cancer patients. It is important to discuss with your doctor any dietary supplements and/or vitamins prior to taking them. Some additional information on nutrition, dietary supplements and vitamins is provided below.

## Cardiac Health

Heart disease is the number one cause of death in men and women in the U.S., even in men with prostate cancer. Because some prostate cancers are slow-growing, many men may die of other causes and not their prostate cancer. Maintaining a healthy diet and regular exercise can be important steps toward preventing diseases that commonly occur with aging, including cardiovascular disease. The key to preventing cardiovascular disease is managing your risk factors, such as high blood pressure, high total cholesterol or high blood glucose. High blood pressure greatly increases your risk of heart disease and stroke. There are no symptoms of high blood pressure, so it is important to have your blood pressure checked and know your numbers. The best way to improve your cardiac health is through controlling your weight, eating a healthy diet, regular exercise, avoiding tobacco and consuming alcohol wisely.

## Dietary Supplements

Dietary supplements include things like vitamins, minerals, herbs and products made from animals and plants. If you are thinking of taking any dietary supplements, be sure to discuss these with your doctor and investigate the side effects associated with the supplement. Most supplements have not undergone rigorous scientific investigation and the side effects, interactions with other drugs are not known. In general, adequate vitamins and minerals can be

achieved through good nutrition and diets containing foods rich in fruits and vegetables, whole grains, beans, lentils and lean meats. Doctors may prescribe supplements to patients based on their individual needs. For example, calcium and vitamin D supplements are recommended to patients on hormone therapy to prevent bone loss. Any physician-recommended dietary supplements will be discussed directly with the patient by their physician.

There are some dietary supplements that are not recommended for prostate cancer patients as high levels of some vitamins and minerals have been shown to have negative health effects. It is generally not recommended to take supplemental vitamin B, vitamin E, and zinc. High doses of vitamin B have been shown to promote cardiovascular disease and even promote cancer growth. High doses of vitamin E can increase the risk of bleeding. This is especially important for men who plan to undergo prostate surgery for prostate cancer treatment. High doses of zinc from supplements has been linked to abnormal immune changes, increased prostate enlargement, and increased risk of aggressive prostate cancer. Men can achieve the necessary amounts of vitamin B, vitamin E and zinc in their diet by eating foods containing whole grains, nuts, lentils, beans and green vegetables.

There are popular herbal supplements, taken by men and women for various ailments, which may not be recommended for prostate cancer patients. As stated above, many of these supplements have not undergone rigorous scientific testing and the side effects, interactions with other drugs are not known. There is some evidence to suggest that fish oils, gingko biloba and saw palmetto may not be recommended for prostate cancer patients. Fish oils (omega-3-fatty acids) and gingko biloba, two of the top-selling supplements in the U.S., have been shown to increase the risk of bleeding and generally are not recommended for patients on blood-thinning medications or patients undergoing surgery, such as prostatectomy. Saw palmetto, a popular herb taken by men with BPH, is not recommended for prostate cancer patients, as the herb can artificially decrease PSA levels, thus making it difficult to monitor the success of prostate cancer treatments. Before taking any herbal supplements, it is important to investigate before you buy or use supplements and discuss with your doctors.

# Choosing the Right Treatment

- Discuss Your Diagnosis and Treatment with Family and Friends
- Questions to Help Guide Your Thinking

Selecting the prostate cancer treatment best for you is a personal decision. Remember, there is no such thing as the "best" treatment. When making this decision, you will need to understand the nature of your diagnosis, the process you will follow to undergo the various treatment options, and the side effects associated with each form of treatment. You may wish to discuss your diagnosis and treatment with family and friends. Some questions that may help guide your thinking are listed below:

- Am I generally healthy? Does longevity run in my family? In general, prostate cancer treatment should be considered in patients who are expected to live at least 10 years.
- Would I be comfortable with active surveillance (if appropriate), or will I be bothered or anxious with the thought of delaying treatment?
- If I choose active surveillance (if appropriate), am I willing to undergo biopsies to be sure my cancer is not worsening in the future?
- If I undergo treatment, would I be more comfortable with having my prostate removed to treat my prostate cancer?
- If I undergo treatment, am I more comfortable with a non-surgical, radiation based approach to treat my prostate cancer?
- How would I feel if I were treated and had to deal with some degree of (usually temporary) urinary leakage?
- How would I feel if I were treated and had more (usually temporary) difficulty urinating or urinary irritation after treatment?
- How important is my sex life to me?
- How would I feel if I experienced worsening sexual function?
- Do I have any difficulty with my bowels today? How would I feel if was treated and had temporary bowel frequency or urgency?

# Additional Information

For additional information, visit the following recommended websites:

ZERO The End of Prostate Cancer: www.zerocancer.org
The Prostate Health Education Network: www.prostatehealthed.org
The Prostate Foundation: www.pcf.org
American Cancer Society: www.cancer.org
CancerCare: www.cancercare.org

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# Notes

# The Urology Group physicians are specially trained to treat the following conditions in both men and women:

- Kidney Stones
- Blood in Urine
- Urinary Tract Infections
- Overactive Bladder
- Incontinence
- Urinary Retention
- Enlarged Prostate and Infections
- Prostate, Bladder, Kidney and Testicular Cancer
- Pelvic Floor Weakness/Prolapse
- Interstitial Cystitis
- Men's Sexual Health, Including Vasectomies and Reversals

THE UROLOGY GROUP
Advanced Care. Improving Lives.

The Urology Group is one of the largest single specialty groups of urologists in the United States. Our purpose is to provide the most advanced urologic care so we can improve the lives of our patients.

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2000 Joseph E. Sanker Boulevard • Norwood, Ohio 45212 • 513.841.7400 • www.urologygroup.com