



# WHAT YOU NEED TO KNOW ABOUT PROSTATE CANCER



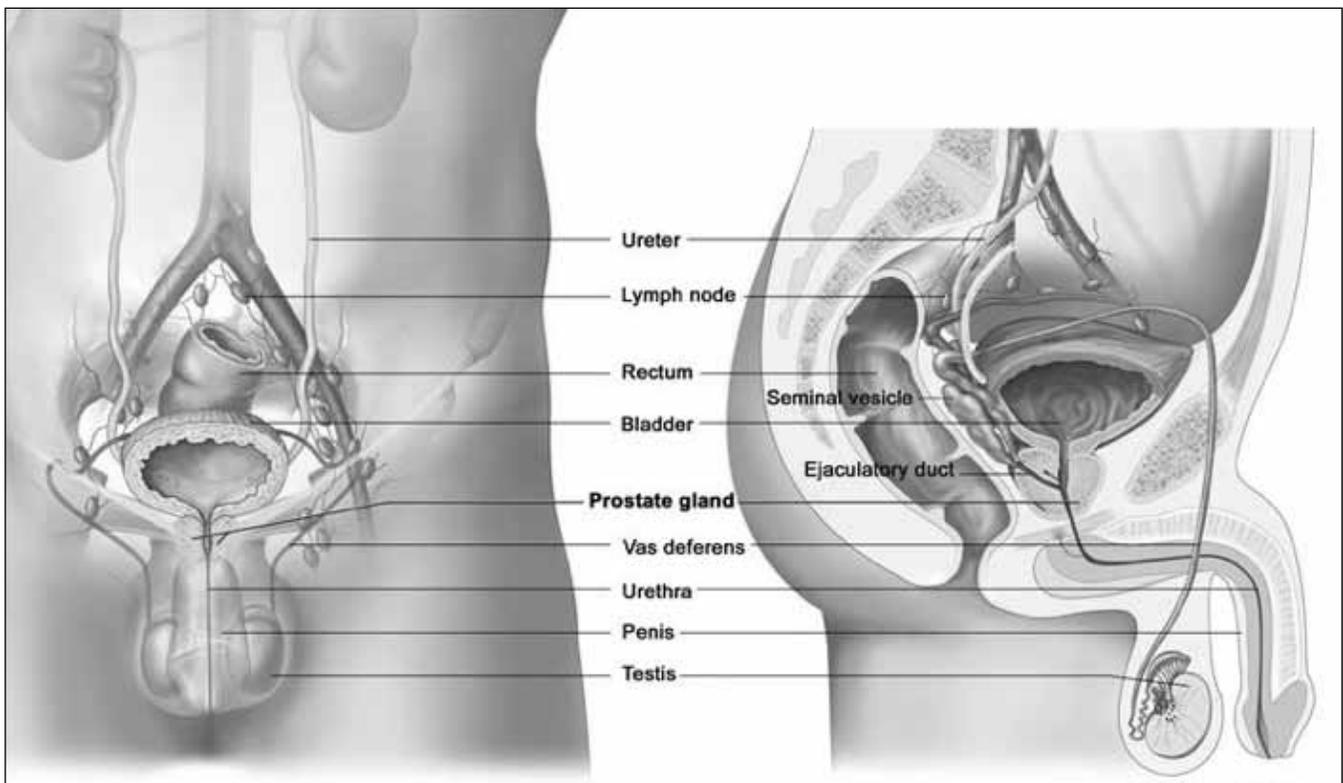
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## BACKGROUND

Prostate cancer is the most common malignancy (other than skin cancer) diagnosed in American men. One man out of every six will be diagnosed with prostate cancer during their lifetime. On an annual basis, approximately 200,000 men are diagnosed with prostate cancer in the United States and just over 30,000 will die of prostate cancer. These statistics show that prostate cancer is a widely variable disease. It has the potential to grow and spread quickly, but for most men, it is a relatively slow growing disease. It is important for patients to discuss with their doctors the various aspects of their particular type of prostate cancer to understand how aggressive it is and how best to treat it.

## Anatomy

The prostate is a walnut-sized gland that is part of the male reproductive system. It is located beneath the urinary bladder and in front of the rectum (see diagram below). The function of the prostate is to make some of the fluid that nourishes and protects sperm cells in the semen. Just behind the prostate are the seminal vesicles, which make most of the fluid for semen. The urethra, which is the tube that carries urine and semen out of the body through the penis, runs through the prostate. The activity and growth of the prostate is stimulated by male hormones called androgens. The main androgen is testosterone, which is produced by the testicles.



## Risk Factors

It is natural to wonder why one develops prostate cancer. The exact cause of prostate cancer, however, is unknown. Research has shown that men with certain risk factors are more likely to develop prostate cancer than men without them. Risk factors for developing prostate cancer include the following:

- **Age over 65:** this is the main risk factor for prostate cancer. The older a man gets, the more likely he will develop prostate cancer. This disease is rare in men under 45 years of age.
- **Family History:** one's risk of prostate cancer is higher if you have a father, brother or son with prostate cancer.
- **Race:** prostate cancer is more common among African American men and less common among Asian/Pacific Islanders and Native American/Alaska Native men.
- **Certain Prostate Changes:** men with cells called high grade prostatic intraepithelial neoplasia (PIN) may be at increased risk for prostate cancer.
- **Certain Genome Changes:** research suggests that the risk for prostate cancer may be linked to specific changes on particular chromosomes.

Having a risk factor does not mean that one will develop prostate cancer. Most men with any of the above risk factors will still never develop this disease.

## Symptoms

Many men with prostate cancer will have no symptoms at all related to the cancer. For those that do have symptoms, they could include any of the following:

- **Urinary problems:** weak urine stream; difficulty initiating urination; stopping and starting during urination; urinating frequently, especially at night; pain or burning with urination. These symptoms are also often associated with noncancerous enlargement of the prostate called benign prostatic hypertrophy or BPH.
- **Blood:** in the urine or semen
- **Pain:** in the hips, pelvis, spine or upper legs

## **SCREENING AND DIAGNOSIS**

Currently, the best way to diagnose prostate cancer is through screening, which is done as part of a routine annual examination by your primary care doctor. The main screening tools for prostate cancer detection are the digital rectal exam (DRE) and the prostate specific antigen (PSA) blood test. If either or both of these tests are abnormal, other tests may be ordered including percent free PSA, PCA 3+ genetic testing, transrectal ultrasound and, ultimately, prostate biopsy.

### **Digital Rectal Exam (DRE)**

For this test, the doctor inserts a gloved and lubricated finger into the rectum. This allows the doctor to feel the back portion of the prostate gland for size, and any irregular or firm areas. It is not accurate at detecting prostate cancer that is situated deep within the gland or is very small.

### **Prostate Specific Antigen (PSA)**

PSA is a protein produced by both normal and cancerous cells in the prostate. Growth of prostate cancer cells as well as other conditions such as benign enlargement of the prostate (BPH) or inflammation/infection (prostatitis) can cause an elevation of the PSA level in the blood. The normal range of PSA is generally considered to be between zero and four nanograms of PSA per milliliter (ng/mL) of blood. If the results of the PSA blood test are above the normal range, or the level has increased rapidly from the last test, the doctor may recommend further testing and possibly a biopsy. It should be noted that men can be diagnosed with prostate cancer even with a PSA in the normal range. In one large study, about 15 percent of men diagnosed with prostate cancer did indeed have a PSA in the normal range.

### **Percent-Free PSA**

The percent-free PSA is a blood test that compares the amount of PSA bound to proteins in the blood to the amount of PSA that circulates by itself (unbound). When the percent-free PSA is found to be less than 25 percent, prostate cancer is more likely to be present. The lower the percentage, the more likely prostate cancer is present. This test can be useful when the standard PSA test is at or just over the high end of the normal range.

### **PCA3Plus®**

PCA3Plus® is a urine test that detects a specific gene called PCA3, which is highly expressed in prostate cancer cells. For this test, the doctor will perform a digital rectal exam and massage the prostate to induce the shedding of prostate cells into the urine. A urine sample is then collected and sent to a laboratory to obtain a PCA3 score. The higher the score, the more likely a biopsy will be positive for prostate cancer. This test is available in Europe and, more recently, in the United States, but it is not yet FDA approved.

### **Transrectal Ultrasound**

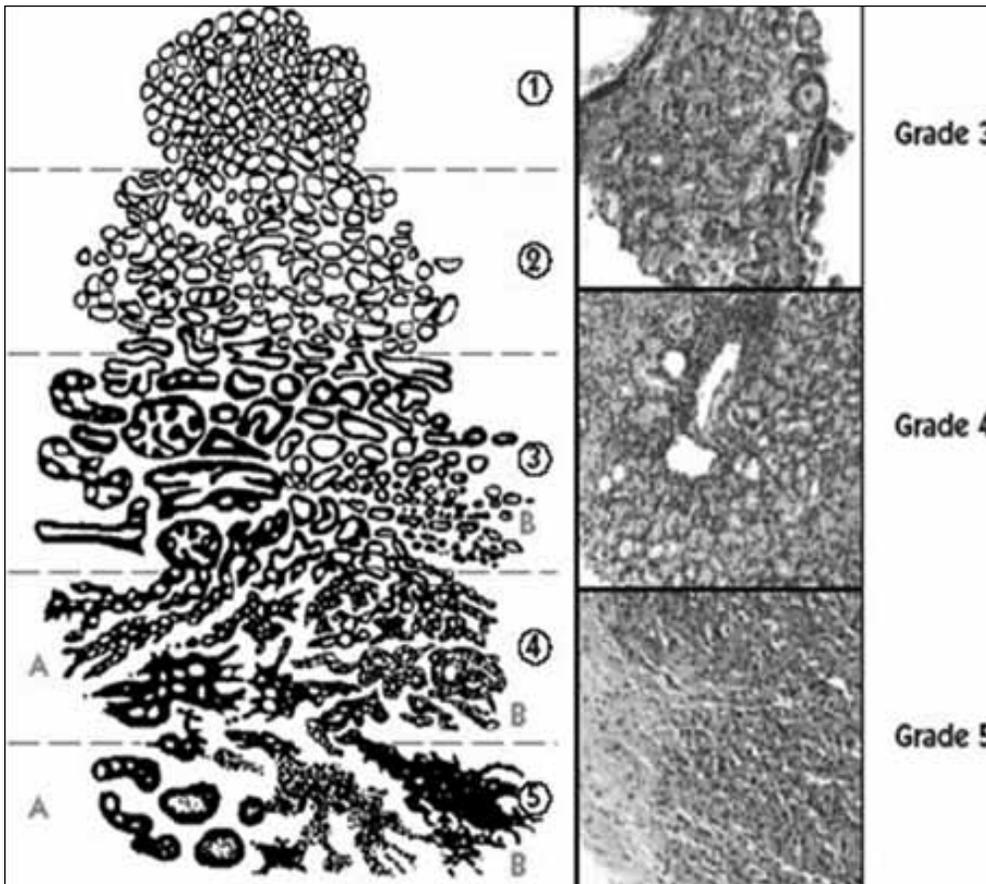
Transrectal ultrasound (TRUS) is a specific ultrasound test that uses a probe inserted into the rectum to visualize the prostate gland. It can be used to measure the size of the gland, detect anatomic variations and sometimes detect abnormal tissue. Needle biopsies of the prostate are usually done under TRUS guidance. A urologist usually performs these procedures in the office by placing the patient on his side and inserting the ultrasound probe into the rectum. Needles are pushed alongside the ultrasound probe through the rectal wall and into the prostate to sample the tissue. Usually 10-12 biopsies are taken covering the entire gland. A newer technique called transperineal saturation biopsy is also done under TRUS guidance. This procedure is usually done under anesthesia, and needles are placed through the skin between the rectum and scrotum (perineum) and into the prostate gland. Up to 24 or more biopsies can be obtained using this technique. Areas that are difficult to access using the transrectal approach can be reached using the transperineal technique. Transperineal saturation biopsy is often done if a prior transrectal biopsy is negative, but other tests, such as PSA, indicate a high likelihood of cancer.

### Prostate Biopsy and the Gleason System

Based on the above mentioned screening tests, a biopsy may be recommended and performed as described using transrectal ultrasound guidance. A pathologist will then examine the tissue samples under a microscope to determine whether or not the prostate contains cancerous tissue. When cancer is discovered, it is classified using a method known as the Gleason system. The Gleason score, named after a pathologist, Dr. Gleason, helps to determine how aggressively the prostate cancer is likely to behave both in how quickly it grows and how likely it is to spread outside of the gland. The Gleason score ranges from a value of two to ten. To come up with the Gleason score, the pathologist uses a microscope to look at the patterns of cells in the prostate tissue. The most common pattern is given a grade of one (most like normal cells) to five (most abnormal). If there is a second most common pattern, the pathologist gives it a grade of one to five, and adds the two most common grades together to make the Gleason score. If only one pattern is seen, the pathologist counts it twice, e.g.  $5 + 5 = 10$ . A high Gleason score (such as 10) means a high-grade prostate tumor. High-grade tumors are more likely than low-grade tumors to grow quickly and spread. See the diagram below for an illustration of the Gleason grade.

The biopsy can also give important indications as to how extensive the cancer is within the prostate by number of cores that are positive for cancer. Another feature that can be seen by the pathologist under the microscope is perineural invasion (cancer invading small nerves within the prostate) which can be an indication of how likely the cancer is to spread outside of the gland.

### Gleason Grade



## STAGING AND RISK STRATIFICATION

Staging is the process used to find out how far the cancer has spread both within and immediately around the prostate as well as if it has spread more distantly to other parts of the body. Several different tests can be used either alone or in combination to determine the extent of spread of the cancer. Not all of these tests are needed in all men. Staging tests include the following:

- **Bone Scan:** a nuclear medicine test in which a small amount of radioactive material is injected into the blood. It travels through the blood stream and collects in abnormal cells in the bones. The patient lies on a table that slides underneath a scanner which detects the radioactive material. The scanner can then make images of the bones which can show areas of increased uptake of the radioactive material, suggesting the presence of cancer.
- **CAT Scan:** also known as computerized axial tomography, a CAT scan is a detailed x-ray that can show both bones and soft tissue of the body. The patient lies on a table which slides through a donut shaped scanner that directs x-rays through the body from many different angles. A dye may be injected into a vein to help organs or tissues show up more clearly. A CAT scan is often used to look for enlarged lymph nodes in the pelvis which may indicate the spread of cancer outside of the prostate.
- **MRI Scan:** also known as magnetic resonance imaging, an MRI scan uses a very strong magnet, radio waves, and a computer to make very detailed images of areas inside the body. The patient lies on a table which slides through a tube shaped scanner that applies a magnetic field across the body. A device called an endorectal coil, which is placed inside the rectum just before the scan, can be used to give very detailed images of the prostate and the immediate surrounding tissue. It can be very helpful in determining if cancer has extended outside the prostate and into adjacent organs or tissues. Newer techniques such as diffusion weighting, dynamic contrast enhancement and MR spectroscopy are currently being investigated to see if they can provide even more detail within and around the prostate.

### Clinical Stage

Clinical tumor stage refers to whether or not the tumor can be palpated or felt on exam and whether it may have spread to lymph nodes or other organs. Clinical stage is based on all information available prior to any treatment and designated by the TNM system as shown below.

### TNM EXPLANATION

T1a	Unsuspected cancer found incidentally during prostate removal (occupying less than 5% of prostate)	NO	No cancer detected in the lymph nodes
T1b	Unsuspected cancer found incidentally during prostate removal (occupying more than 5% of prostate)	N1	Metastasis to regional lymph node(s)
T1c	Cancer that is detected only because of elevated PSA (normal digital rectal exam)		
T2a	Cancer that is felt and occupies 50% or less of one side		
T2b	Cancer that is felt and occupies more than 50% of one side		
T2c	Cancer that is felt and occupies both sides of the prostate		
T3a	Cancer that extends outside the prostate but not to the seminal vesicles.	M0	Cancer that is confined to the prostate, surrounding tissues and pelvic lymph nodes
T3b	Cancer that has invaded the seminal vesicles	M1	Cancer that has spread beyond the pelvic area to bones, lungs, etc.
T4a	Cancer that invaded the bladder neck and/or rectum and/or external urinary sphincter		
T4b	Cancer that involves other areas near the prostate		

## **Risk Category**

Risk category is the most common way that doctors determine the aggressiveness of a particular cancer. Each risk category indicates how quickly the prostate cancer will grow and how likely it is to spread outside of the prostate. Recommendations regarding which forms or combination of forms of treatment are highly influenced by the particular risk category of a patient. Risk categories are divided into three main groups (low, intermediate and high) as described below:

- **Low Risk**

T1 or T2a

Gleason score < or = 6, and

PSA < or = 10

- **Intermediate Risk**

T2b or T2c

Gleason score 7, or

PSA 10 -20

- **High Risk**

T3 or T4

Gleason score > or = 8, or

PSA >20, or 2-3 intermediate risk factors

During discussions with your physicians, you will be made aware of the chances of treatment success through the use of these risk groups. While they are recommended for use during discussions on treatments of prostate cancer, all treatment decisions will be placed into perspective with regard to the individual patient's age, overall health status and personal preferences.

Discussing cancer treatment options can be a perplexing and anxious time. It is important that you discuss all treatment options with your physicians before making any decisions regarding which treatment to pursue. A well-rounded discussion with multiple physicians representing several different specialties including urology, radiation oncology and medical oncology should be considered in order to make the best decision about your prostate cancer treatment. Any questions that you may have about any of these various treatments can be brought up during discussion with these doctors.

## **PROSTATE CANCER TREATMENT OPTIONS**

The treatment of prostate cancer depends upon the type of cancer, whether or not the cancer has spread (metastasized), patient's age, general health status, and prior prostate treatments the patient may have undergone. There are three standard therapies for men with organ-confined prostate cancer. They are active surveillance, surgery (radical prostatectomy) and radiation therapy. No adequate prospective clinical trials have directly compared these three options. This makes it difficult to compare outcomes in men treated with either surgery or radiation. The best data available is that from retrospective comparative studies and, while useful, should not be the sole determinate of what would be the best treatment option for the patient. In order to provide an unbiased recommendation, it is important to consult both urologic surgeons and radiation oncologists. Each of the treatment options will be discussed in detail in this section.

### **Active Surveillance (also known as watchful waiting)**

In select patients with prostate cancer, the best choice may be active surveillance. Active surveillance also is called "watchful waiting." Active surveillance may be recommended only if a cancer is not causing any symptoms and is expected to grow very slowly. This approach is sometimes suited for men who are older or have other serious health problems. Because some prostate cancers spread very slowly, older men who have the disease may never require treatment. Other men choose active surveillance because they feel the side effects of treatment outweigh the benefits. Active surveillance does not mean that a man receives no care. Rather, the cancer is regularly and carefully monitored with PSA and clinical evaluation, often every three to six months. If progression of the cancer is seen, active treatment can be started. In most situations, men on an active surveillance program will be asked to undergo intermittent prostate biopsies to ensure that the cancer is not becoming more aggressive.

### **Radical Prostatectomy**

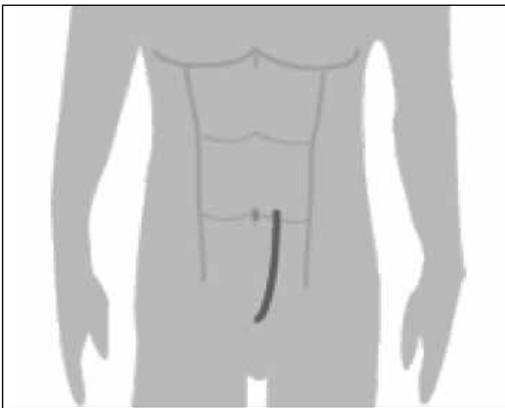
Surgical treatment for prostate cancer involves removing the entire prostate as well as the seminal vesicles, a procedure called radical prostatectomy. If the cancer is confined within the tissues removed at surgery, a surgical procedure alone can successfully cure localized prostate cancer. After surgery, the PSA level in the blood should decrease to undetectable levels. Thus, PSA acts as an excellent test to detect even small amounts of residual cancer.

## Surgical Technology

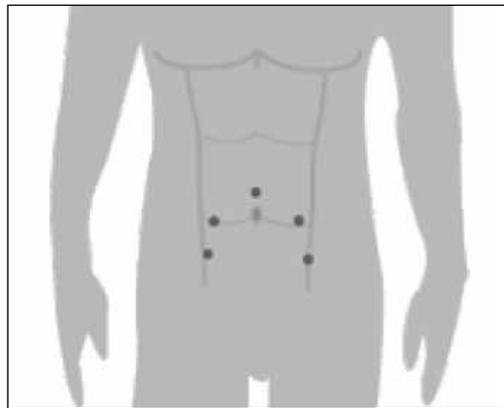
Peninsula Prostate Institute offers state-of-the-art surgical technology with an experienced team of doctors, nurses, and technical staff to deliver the highest quality care possible. There are two main types of radical prostatectomy—open radical retropubic prostatectomy and laparoscopic radical prostatectomy. Each patient receives a customized treatment plan depending on the nature of the cancer, the patient’s unique symptoms and overall health.

In the open **Radical Retropubic Prostatectomy** (RRP), your surgeon makes a skin incision in the lower abdomen. A pelvic lymph node dissection (PLND) may be performed prior to removal of the prostate to more accurately determine if prostate cancer is present in the lymph nodes. This staging procedure is not necessary in all patients. After the pelvic lymph node dissection is completed, the prostate is removed from both the bladder and the urethra. A nerve-sparing prostatectomy may be performed with this approach. When performing a nerve sparing procedure, the surgeon carefully spares the small bundles of nerves located on either side of the prostate gland that are needed for erections.

After the prostate is removed, the bladder is connected to the urethra with sutures. An RRP typically takes 2-2.5 hours to perform, and in most cases, surgery is followed by a hospital stay of two to three days. Most patients are away from work four-six weeks. Patients are given an opportunity to donate their own blood before surgery, which can be given back to you during the operation. On average, less than 10% of patients require blood transfusion during or after radical prostatectomy. A catheter is placed through the penis and remains in place 10-14 days while the tissues heal.



*Open RRP Incision Location*



*LRP Incision Locations*

**Robotic Assisted Laparoscopic Radical Prostatectomy** (RALP or daVinci® Prostatectomy) is a minimally invasive surgical technique used to remove the prostate and seminal vesicles in patients with prostate cancer. Your surgeon performs the procedure through five 1-cm incisions spread in the shape of a fan across the lower abdomen. The surgeon views the surgical field through a surgical camera (called a laparoscope) inserted through one of the incisions. While not all patients with prostate cancer are a candidate for a laparoscopic approach, most are and should discuss this with their surgeon.

Your surgeon performs the procedure using a robotic surgical assist device called the daVinci® Surgical System. This robotic system employs the latest advancements in surgical robotics. Keep in mind that the term “robot” can be misleading, the daVinci® Surgical System is merely an extension of the surgeon’s hands. Robotic surgery is used around the world on a daily basis with great success. There are numerous redundant safeguards built-in to the daVinci® Surgical System and your surgeon is always in control of your surgery and the robot. If there is a malfunction, the robotic system will automatically enter a passive safe mode that halts all robotic movement. Once this alert has been addressed, the robotic procedure can be completed. In the exceedingly rare event that the robotic system cannot be used, your surgeon can complete the procedure with either a standard laparoscopic technique or via an open surgical technique.



*Patient Cart with Instrument and Camera Arms*



*Surgeon's Console View*

There are several components to the robotic system that allow the surgeon to perform laparoscopic surgical procedures with greater ease and precision. The surgeon’s console, where the surgeon views the operative field and controls the instruments, is located in the operating room. The patient cart contains the 4 robotic arms which hold the camera and instruments used during the operation. The instrument cart provides lighting and additional viewing capabilities.

Patients considering surgical treatment for their prostate cancer have common concerns: cure from cancer, recovery after surgery, and conservation of urinary continence and sexual function. LRP is as effective in treating patients with prostate cancer as open surgery, and has shown excellent results in return of urinary continence and sexual function. In addition, patients who undergo a laparoscopic procedure can expect less blood loss and less risk of blood transfusion, smaller incisions and less surgical scarring, less postoperative pain, a shorter hospital stay and recovery, and a quicker return to daily activities when compared to traditional open surgery. Patients undergoing LRP can expect a hospital stay of 24-48 hours. An LRP typically takes 2.5-3.5 hours to perform, and most patients are away from work two to four weeks. A catheter is placed through the penis and remains in place seven days while the tissues heal.

## **Side Effects**

The potential side effects of a radical prostatectomy are incontinence and impotence. These side effects are a product of the location of the prostate and the type of surgery performed. The prostate gland lies deep within the pelvis behind the pubic bone and in front of the rectum. The urinary bladder lies just above the prostate, the urinary sphincter control muscle is located just below it, and the erectile nerves lie just outside the prostate on either side. As result, precision is paramount to minimize injury to these important structures during surgery. While the risks associated with both radical prostatectomy techniques are similar to those of any major operation and depend on a number of factors, they are most dependent on the patient's overall health and age. Rare risks include cardiac or pulmonary events, blood clots, or injuries to structures around the prostate.

## **Urinary Control**

Following surgery, bladder control usually returns within 11-12 weeks and continues to improve over 12 months. Less than five percent of patients have severe incontinence which is persistent. This group of patients may wear pads, take oral medications or undergo additional procedures to treat this side effect. Mild incontinence when coughing, laughing or sneezing may persist in some patients. These patients sometimes choose to wear pads to protect themselves from unexpected leakage with activity. Of patients who undergo a robotic assisted laparoscopic radical prostatectomy, most have excellent urinary control and require no pads for urinary leak protection after a period of 12 months.

## **Sexual Function**

Sexual dysfunction is a common problem in both men and women. Sexual problems often become progressively more common with aging. Heart disease, high cholesterol and diabetes also adversely affect erections. The treatment of prostate cancer can have significant impact on sexual function. In our experience, men who are younger than age 60 with non-aggressive cancers and those who have the highest levels of pre-operative sexual function have the best outcomes in terms of potency.

A nerve-sparing prostatectomy is performed if there is no indication of tumor involvement within the nerves surrounding the prostate. A unilateral nerve-sparing procedure will save the nerves on one side of the prostate and a bilateral nerve-sparing procedure saves the nerves on both sides of the prostate. If a patient has a locally advanced tumor or an extensive posterior cancer, a nerve-sparing surgery is not offered because of concerns about leaving cancer behind at the surgical margins.

Men who have "normal" pre-operative sexual function (Erectile Function Score of >20) have approximately a 70 percent likelihood of having erections that are adequate for penetration following a bilateral nerve-sparing operation. A quarter of these patients require Viagra® or other medications in order to reach their maximal level of potency. If a unilateral nerve-sparing procedure is performed, almost 40 percent of men will have erections that are adequate for sexual activity. Less than one in ten men who undergo a non-nerve sparing procedure will have erections adequate for intercourse after surgery. In patients that are unable to obtain satisfactory erections after surgery, additional procedures are available to restore erections and sexual function. At the time of your consultation, physicians at the Peninsula Prostate Institute will assess urinary and sexual function. Treatment recommendations are based upon baseline sexual function, patient age, risk factors and disease stage. Counseling is provided to the patient and his partner about anticipated changes in sexual function and the likelihood of preserving and recovering sexual function after prostate cancer treatment.

## Potency Recovery

Multiple studies have shown that there is often a several month interval before a patient recovers normal erection, even with bilateral nerve-sparing surgery. Potential explanations for this time delay include transient nerve injury, postoperative psychological issues, and a history of infrequent or non-rigid erections; all of which decrease the flow of oxygen to the erectile tissues. This delay in recovery of potency can be improved by employing a careful surgical technique and minimizing potential trauma to the nerves. We also offer a preoperative counseling program for the patient and his partner to address postoperative concerns and minimize the psychological impacts of surgery.

Finally, by providing early erections with the assistance of medications, patients may avoid long-term penile tissue damage, thus expediting the return of spontaneous erectile function. Studies by Raina et al, Montorsi et al, and Nandipati et al demonstrate that early initiation of oral and/or intra-urethral treatments may return the patient to long-term spontaneity and appear to shorten the recovery time to regaining erectile function.

We recommend that, within the first one to two weeks after catheter removal, all patients who have undergone prostatectomy should begin self stimulation to enhance eventual recovery of potency. Oral agents (Viagra,<sup>®</sup> Levitra<sup>®</sup> or Cialis<sup>®</sup>) are prescribed to enhance the flow of oxygen to penile tissue. The most common side effects are headaches, flushing, blurred vision, and nasal congestion. We request that patients attempt to have at least three erections per week in the months after surgery in order to maximize post-operative recovery.

For patients who desire to preserve pre-procedure erectile function as much as possible, the physicians at the Peninsula Prostate Institute offer the Erectile Preservation Protocol developed by Baylor College of Medicine which utilizes intraurethral Prostaglandin E-1 (MUSE<sup>®</sup>), oral agents (Viagra,<sup>®</sup> Levitra<sup>®</sup> or Cialis<sup>®</sup>), and supplemental vacuum vasodilatation. This is an aggressive program that begins two weeks prior to surgery and continues for two months afterwards.

Overall, the recovery of erectile function is highly dependent on the patient and his partner's education about treatment-related sexual issues. Open sexual communication between partners is essential. Other issues, such as loss of sexual desire, difficulty reaching orgasm, ejaculatory problems or sexual pain also should also be addressed.

## **FREQUENTLY ASKED QUESTIONS REGARDING RADICAL PROSTATECTOMY**

### THE WEEKS PRIOR TO SURGERY

#### **When should I stop aspirin prior to surgery?**

10 days. It is okay to take Tylenol for minor aches and pains.

#### **When should I stop taking NSAIDS (Ibuprofen, Aleve, Naprosyn, Celebrex) prior to surgery?**

10 days.

#### **Do I need to stop taking any over-the-counter supplements prior to surgery?**

Do not take any vitamins, supplements, or over-the-counter medications 10 days prior to surgery.

#### **I take blood thinners (Coumadin, Warfarin, Plavix), when do I need to stop taking it prior to surgery?**

**ALL BLOOD THINNERS MUST BE STOPPED PRIOR TO SURGERY!**

- If you are taking **Coumadin** or **Warfarin**, it must be stopped prior to your surgery. The timing of the holding of the medication is an individualized decision that your primary care physician or cardiologist will make with you. In most cases, patients are asked to stop taking Coumadin or Warfarin five days prior to surgery.
- If you are taking **Plavix**, it must be stopped prior to your surgery as well. This is also an individualized decision that your primary care physician or cardiologist will make with you. In most cases, patients are asked to stop taking Plavix 10 days prior to surgery.

#### **Do I need to stop any of my other medications prior to surgery?**

You will have a pre-admission appointment a few days prior to your surgery. They will instruct you in the management of your medications.

#### **When should I start Kegel squeeze exercises?**

In the weeks and days before surgery, begin doing Kegel squeeze exercises every day to strengthen your pelvic urinary control muscles. This will help you regain urinary control faster after your surgery.

### THE DAY PRIOR TO SURGERY

#### **What should my diet be prior to surgery?**

The day before surgery, you will be asked to stop solid foods after breakfast.

#### **Is there a bowel preparation I need to take prior to surgery?**

On the day before surgery, have only clear liquids. You may be instructed to drink one (1) full bottle of Magnesium Citrate in the afternoon to help empty and clean out your intestines. You can get this over-the-counter in any drug store. Do not eat or drink anything after midnight the night before your surgery. It is okay to take medication with a small sip of water up until the morning of surgery.

### DAY OF SURGERY

#### **What should I bring with me on the day of surgery?**

A list of the medications you take at home, comfortable clothing and toiletries. Please leave all valuables at home including wedding rings and watches. Bring reading glasses if you wear them and do not wear contact lenses.

#### **How long will I be in the hospital?**

Most patients are discharged home 24-48 hours after surgery.

## AFTER DISCHARGE

### **What do I do if the pain medication makes me constipated?**

Constipation is a common side effect of many medications. It may be several days after surgery before you have a normal bowel movement. Make sure to drink adequate fluids. You may also use prunes, mineral oil, warm prune juice, or milk of magnesia for relief. Do not use any rectal suppositories or enemas.

### **What should I eat once I am at home?**

You are free to resume your normal diet. But until you have a normal bowel movement, it is recommended that you take primarily liquids.

### **When will I have my follow-up appointment?**

You should call your physician's office after arriving home. Typically, you will be seen in follow-up seven to eight days after surgery. Bring briefs and some type of incontinence pad, available at local drug and grocery stores (Depends, Poise, or store brand name), to your first post-op visit.

### **Can I shower?**

You may shower as soon as you return home. It is safe for you to shower with the urinary catheter and abdominal drain tube (if it is left in place).

## CATHETER ISSUES

### **Who teaches me to take care of my catheter?**

Prior to discharge, your nurse will show you how to use a leg bag when you are walking around. You will learn how to change from one bag to another. The larger "bedside bag" is used when you are ready to go to sleep. Make sure to hook the bedside bag on to something such as the drawer of a bedside table or a chair so that it doesn't pull on your catheter. It is important to not allow anything to pull on the catheter or allow the bag to become caught on anything as this may cause injury to the bladder and urethra.

### **How do I get around with my Foley Catheter?**

When out in public, remember to use the leg bag and fasten it comfortably under loose fitting pants such as sweat pants. Prevent rubbing of the catheter against the opening of your penis by securing the leg bag on your lower leg in a way that the tubing doesn't catch or move with each step. You should remember to drink lots of fluid while your catheter is in place. Also, it is normal for your catheter to leak when having bowel movements.

### **What does it mean when I see blood in my urine?**

The balloon on the end of the catheter can irritate the bladder causing some bleeding. Most of the time, this bleeding will resolve with hydration and rest. If the color of the urine looks like tomato juice or ketchup, you should call your surgeon's office immediately.

### **Are any particular fluids better to drink than others?**

Water is usually best. But any fluid is acceptable to drink.

### **Urine is leaking around my catheter, what should I do?**

This is a temporary inconvenience – not a permanent problem. This is usually related to bladder spasms. If the leakage around the catheter becomes bothersome, call the Urology nurse at your doctor's office to consider taking an anti-spasmodic agent if you were not already given this prior to your discharge from the hospital. Leaking may also occur when having bowel movements.

## ACTIVITIES AND EXERCISE

### **When do I start actively moving around after prostate surgery?**

Almost immediately. By the afternoon or evening after surgery, your nurse will assist you in sitting up at the side of your bed or in a chair. You will be asked to stand and walk the morning following surgery. The first few times you stand up, you will need someone to help you. A nurse will support you under your arm as you stand and walk to a chair. Once comfortable, you may begin to walk in the hallway. During your hospital stay, you should plan on walking in the hallways every hour when you are awake. When you get home, continue your program of rehab and recovery by developing a plan of exercising and keeping to it. The foundation for this program should be frequent short periods of walking. As you feel comfortable or as you need to get out of the house, move your walks outdoors, at first to the back yard. Then walk the block. In time you will be walking a block then two then a mile and so forth.

### **Should I exercise after my surgery?**

Yes! Exercise after surgery is very important. Even if you were active and fit before surgery, you will have reduced strength and a decreased ability to do some activities. A sensible exercise program, adapted to your level of health and fitness, will help you recover sooner. While most patients are able to return to limited normal activities such as driving or working at a desk, it will likely be six to eight weeks before you are back to your pre-surgical stamina and strength. Fortunately, by employing a basic exercise program, you will be surprised how good you will feel in just a few weeks.

### **What about pain and exercise?**

Whether at the hospital or at home, we expect you to need pain medication to allow you to move around easily for the first week or two. Oral pain medications usually take about 30 minutes to take effect. Anticipate when you will need medication. It is recommended that you gradually take yourself off the narcotic pain medication (Vicodin or Percocet) and use Tylenol instead.

### **How will I know if I have pushed myself too far?**

Fatigue, weakness, light headedness, dizziness, nausea or feeling flushed are some things you may feel if you have done too much. It is normal to feel like you tire sooner with less exercise than before. You may also feel some discomfort or stretch low in the pelvic area. You also may notice blood in your urine if you have pushed yourself too far. Stop and rest before these symptoms become too severe. Be active and exercise, but be sensible. Several shorter periods of exercise are better than a few longer ones.

### **When can I drive?**

You may drive after the catheter has been removed as long as you have stopped taking narcotic pain medications (Vicodin, Percocet).

### **When can I return to work?**

You may return to work without restrictions six weeks after surgery. Some patients return to limited work such as desktop or computer tasks two weeks after they are discharged from the hospital.

### **May I stretch or perform yoga?**

Light stretching can be started almost immediately. It is important to listen to your body. Start gently and be sensible. If you feel pain or pulling, stop immediately.

### **What other activities can I do and when?**

- Walking - the day after surgery.
- Treadmill - level treadmill at a walking pace is permissible once you are home.
- Walking up stairs- you may walk up or down stairs in your home to get to your destination. Do not do stairs or use a stair-climber for exercise until six weeks after your surgery.
- Lifting >10 pounds - four weeks.
- Golf - putting only for six weeks.
- Bicycle or motorcycle riding- three months after surgery.

## SEXUAL FUNCTION RECOVERY

### **How often should I use medications after surgery (Viagra, Levitra or Cialis)?**

If you're interested in erectile preservation, begin using one of the above three agents within the first week after the catheter has been removed.

- You should take 50 mg of Viagra or 10 mg Cialis or 10 mg Levitra three times weekly.
- You do not need to attempt intercourse (self stimulation or masturbation is acceptable).
- If you do not see improvement in your erections after two to four weeks of therapy, you should speak to your physician about increasing the medication dose or using additional medications.

### **If I have erections without Viagra, Levitra or Cialis, do I need to take the medication?**

No.

### **Will my erection be shorter after surgery? What fills the area where the prostate used to be?**

The base of the bladder fills the space where your prostate used to reside. Your penis may be 1 cm shorter with a full erection following surgery.

### **When can I have intercourse?**

Intercourse is safe as soon as you are comfortable to do so. Please remember that you may not lift anything heavier than a laptop computer or a gallon of milk (10 pound lifting restriction) for four weeks following surgery. Sexual intercourse should be appropriately tailored to these restrictions.

### **How soon will my erections return?**

The recovery of sexual function after surgery has many variables. Your pre-operative level of erectile function, your age, the presence of diabetes or high blood pressure, and what type of nerve sparing procedure you underwent all have a significant impact on the recovery of erectile function. Patients often experience a continued improvement in erections over a 12 month period after surgery. We recommend that you speak with your physician directly regarding how soon and to what degree you should expect recovery.

## CONTINENCE RECOVERY

### **When will my catheter be removed?**

The catheter is removed seven days after a laparoscopic robotic assisted radical prostatectomy and 10-14 days after an open radical retropubic prostatectomy.

### **Who will remove my catheter?**

At your one week follow-up appointment your physician or nurse will remove the catheter in the office. **The catheter is NOT to be removed prior to that appointment.** An x-ray study of the bladder may be obtained the day prior to your appointment.

### **What clothing should I wear to clinic when my catheter is removed?**

Comfortable clothing with jockey shorts, not boxer shorts. You should purchase some incontinence pads prior to this appointment and bring one to your appointment.

### **Will I know when I need to urinate?**

Yes. The bladder will begin to feel full and you will have the feeling of needing to urinate.

### **How long until my urinary control returns?**

Most patients note significant resolution of urinary incontinence by 12 weeks following surgery. Improvement will continue for a full year after surgery. The period of time that a pad is used varies from patient to patient. Some people never require a pad; others will use pads for three-four months. Your use of a pad depends on the duration and volume your of leakage.

### **Can I do exercises to enhance my urinary control?**

Kegel exercises will help strengthen the external urinary sphincter, the muscle that provides urinary continence and control of urinary flow. Please perform the Kegel exercises be as follows:

- Contract the urinary control muscle for 10 seconds, and then relax for a period of 10 seconds. This muscle is the same muscle that you would use to stop your urine in midstream.
- Cycle of contraction and relaxation must be performed for 10 minutes each day, by the clock or a watch.
- The 10 minutes per day may be broken up any way you choose; as long as 10 minutes per day are completed.

## **SUMMARY OF POST OPERATIVE INSTRUCTIONS**

Be gentle with your body as you heal after your procedure. It takes time for you to rehabilitate from your surgery. Give yourself adequate rest but stay active, taking time to rest when needed. Overall, walking is probably the best activity. Start by walking around the house and yard. Once you are comfortable, walk around the neighborhood. Other activities may be added as tolerated. Please follow your physician's recommendations during this period. Create your own exercise program and find activities that are fun and engaging. Get going on the road to recovery and back to your everyday activities.

## **Cryosurgery**

Cryosurgery (also called cryoablation or cryotherapy) can be used to treat localized prostate cancer by freezing the cancerous cells. This procedure is performed under general or spinal anesthesia and may be performed as an outpatient procedure or may require an overnight stay. The probes are placed through skin incisions located between the anus and scrotum. Guidance and monitoring of therapy is performed using transrectal ultrasound.

The appearance of prostate tissue in ultrasound images changes when it is frozen. To be sure enough prostate tissue is destroyed without too much damage to nearby tissues the surgeon carefully watches these images during the procedure and monitors the progress of the freezing using temperature probes. A suprapubic catheter is placed through the abdominal wall just above the pubic bone into the bladder so that when the prostate swells after the procedure it will not block the passage of urine. This catheter is usually removed in 10-14 days after the procedure. It is normal to experience bruising and tenderness in the perineum where the freezing probes were placed. This usually resolves in 7-10 days.

Compared to surgery or radiation therapy, less data is available regarding the long-term effectiveness of cryosurgery. Current techniques using ultrasound guidance and precise temperature monitoring only have been available for a few years. Results of long-term (10- to 15-year) follow-up have yet to be collected and analyzed. As a result, it is common for patients to pursue this modality only if they are not good candidates for other treatments such as radiation or surgery, or have had their cancer return despite radiation therapy. As a result, physicians often do not include cryotherapy in the options they routinely consider for initial treatment of prostate cancer.

## **Radiation Therapy**

Radiation therapy is a non-invasive treatment for prostate cancer that uses x-rays or gamma-rays to eradicate prostate cancer cells. There are several forms of radiation therapy that may be recommended. Each patient receives a customized treatment plan depending on the nature of the cancer, the patient's unique symptoms and overall health. The Peninsula Prostate Institute offers state of the art radiation therapy technology with an experienced team of doctors, nurses, and technical staff to deliver the highest quality care possible. The various forms of radiation therapy are described below.

### **External Beam Radiation Therapy**

External beam radiation therapy is delivered using an x-ray machine called a linear accelerator (see Figure 1). Treatment is delivered on a daily basis, five days per week, for up to seven weeks. It can be used alone or in combination with interstitial seed brachytherapy as primary treatment for prostate cancer. External beam radiation therapy can also be used after surgery if it appears that the tumor was not completely removed. It also can be used to shrink tumors that have spread from the prostate to other parts of the body (such as the bones) and relieve pain. The daily treatments take anywhere from 5-15 minutes per day. Patients can select the time of day they would like to be treated and are given the same appointment time each day. One cannot feel the treatment as it is being delivered. The entire course of treatment is delivered in the outpatient setting and patients can usually drive themselves to and from the radiation facility.

Before treatment begins, several steps (taking a few days to a few weeks) are required to create a customized treatment plan for each patient. This usually includes placement of positioning markers (see IGRT section below), as well as a CT and sometimes an MRI scan. Information from the CT and MRI is transferred to a computer in order to create a very accurate 3D model of the body which helps to determine the best radiation beam size, strength and angles to use in order to optimize the treatment plan. A rigorous quality assurance review is performed by a medical physicist to verify the parameters set by the computer-generated treatment plan. A "dry run" session on the linear accelerator is then performed the day before treatment begins to insure the accuracy of the x-ray beam delivery.



Figure 1: Linear Accelerator

**Intensity Modulated Radiation Therapy (IMRT)**  
IMRT is an advanced form of external beam radiation therapy. It allows for very high radiation doses to be delivered to areas containing cancer (the prostate, seminal vesicles and lymph nodes) while minimizing dose to the surrounding normal tissues (such as the bladder and rectum). Sophisticated treatment planning computer software is used to test thousands of combinations of radiation beam sizes, strengths and angles to most precisely mold the radiation doses around the target. IMRT treatments usually take 10-15 minutes per day to complete.

### **Volumetric Arc Therapy (VMAT)**

VMAT represents the latest advance in external beam radiation therapy. Like IMRT, it also facilitates the delivery of very high doses of radiation to cancerous tissue while minimizing dose to surrounding tissues. It also requires sophisticated treatment planning computers and software to optimize the treatment parameters. However, a VMAT treatment can be completed in just two-three minutes per day. This technique not only makes daily treatment more convenient, it can also improve patient comfort and tolerance to therapy.

### **Image Guided Radiation Therapy (IGRT)**

IGRT describes various techniques used to localize the prostate and other important organs within the body. These techniques play a critical role in accurately delivering radiation dose to the tumor and minimizing dose to the surrounding normal organs and tissues. The following describes techniques used in the treatment of prostate cancer.

### **Gold Fiducial Markers**

Three small gold markers (see Figure 2 below) are placed into the prostate under ultrasound guidance using a transrectal approach similar to a prostate biopsy. These markers are placed a few days prior to performing special treatment planning CT and MRI scans. Daily x-ray pictures are then taken prior to each treatment and a triangulation calculation is made similar to the way a global positioning system (GPS) works in order to precisely locate the prostate within the body. Adjustments can be made with 1-2 millimeter accuracy to line up the radiation beam with the prostate. Studies have shown that from day to day, the position of the prostate can vary up to 10-12 millimeters (about half an inch). The gold fiducial marker system can account for these daily position differences. This variability is called interfraction motion.



Figure 2 – Gold fiducial markers (actual size 4mm)

### Calypso® 4D Tracking System

This system is the first of its kind to allow continuous real-time monitoring of prostate position within the body. Small radiofrequency beacons are placed into the prostate (similar to the gold fiducial markers) and can be tracked both before and during the treatment session by a radiofrequency panel array placed over the body. The system can be used to line up the radiation beam before each treatment like the gold fiducial system, but it is then left in place during the treatment and continuously checks the position of the prostate at a rate of 10 times per second (see Figure 3). The system alerts the radiation therapists if the prostate moves out of alignment. The treatment can then be paused, the patient re-aligned, and the treatment is then allowed to continue. Studies have shown that, during the time it takes to deliver a single radiation treatment, significant movement of the prostate can occur (intrafraction motion). The Calypso® 4D tracking system can account for both interfraction and intrafraction motion insuring the precise delivery of radiation with submillimeter accuracy at all times during the treatment. As a result, this system has been shown to help reduce radiation side effects on the bladder and rectum. The radiation oncologists at Peninsula Cancer Center were one of the first in the United States to incorporate Calypso® into external beam radiation treatments for prostate cancer.

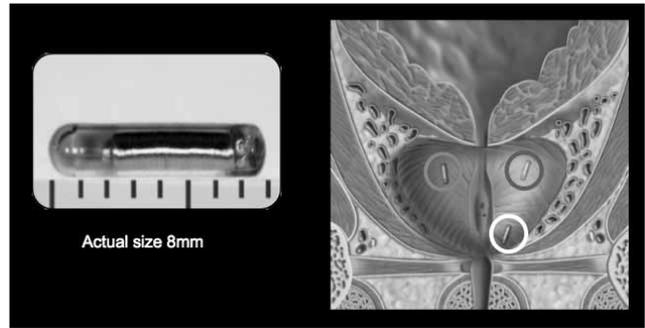


Figure 3 – Calypso® radiofrequency beacons

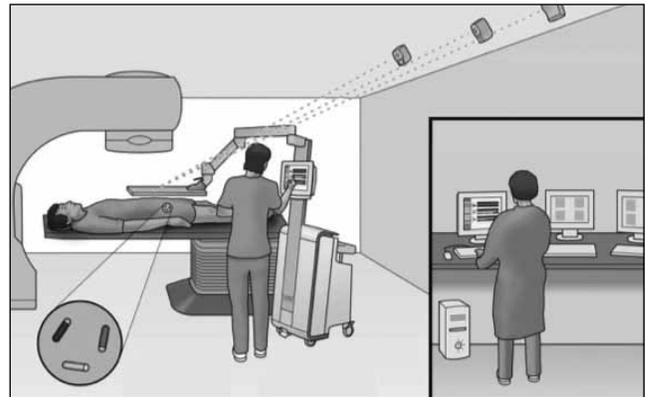


Figure 4 – Calypso® 4D localization system

### Cone Beam CT

This system is another localization technology which utilizes a CT scanner built onto the linear accelerator. Regular CT scans can be used before treatment to help localize the prostate similar to the gold fiducial system. They can also be used to assess bladder and rectal filling which can also help to minimize radiation dose to those organs. This technology can be used for patients treated with radiation therapy primarily, or after prostatectomy in which the tumor was incompletely removed.

### **Side Effects of External Beam Radiation Therapy**

The side effects of external beam radiation therapy can be divided into early (occurring during or shortly after treatment) and late (occurring months or years after treatment) effects. These effects are related to the organs around the prostate. The bladder and rectum sit just above and just behind the prostate, respectively. Typical early effects include bladder and rectal irritative symptoms such as frequency and urgency. Patients may also notice a weaker urinary stream, getting up more often to urinate at night (nocturia), and loose or irregular bowel movements. These effects may be noticed about halfway through the course of treatment and slowly increase in intensity until the end of treatment. They usually resolve within a few weeks after completion of treatment. Patients usually meet with the radiation oncology doctors and nurses on a weekly basis during a course of treatment at which time advice and any necessary medication can be provided to alleviate these symptoms. Late effects are much less common than early effects, but can be more serious and long lasting. Urinary stricture or incontinence are rare, but can occur particularly in patients who have significant urinary problems prior to treatment. Rectal inflammation, called proctitis, can occur, but infrequently becomes serious enough to require treatment. Loss of potency (ability to have an erection) can occur and is directly related to the patient's age and erectile function prior to treatment. Medications known as PDE-5 inhibitors are often helpful in improving this problem.

### **FREQUENTLY ASKED QUESTIONS ABOUT RADIATION THERAPY**

#### **What sort of activity can I do during radiation therapy?**

There are no restrictions with regard to physical activity during radiation treatments. Most people can work, drive a car, exercise and carry on their usual daily activities during a course of treatment.

#### **Will I feel the radiation while I am under the treatment machine?**

No. Receiving radiation treatment is similar to getting a chest x-ray or CAT scan. You do not feel anything while the x-rays are being delivered.

#### **Am I radioactive after treatment?**

No. X-rays delivered during treatment do not stay in your body. When you leave the treatment room after each daily session, you are not radioactive.

#### **Will the radiation treatments make me sick?**

No. You will not be nauseated and your hair will not fall out as a result of treatment.

#### **How do I know if the treatment worked?**

You will undergo regular follow-up visits. Prior to each visit, you should have a PSA blood test which will help your doctor evaluate the status of your cancer. The PSA will drop to its lowest level, or nadir, between 6 and 18 months after treatment and usually is at a level below 1.0 ng/mL. The PSA should remain around that level on subsequent follow-up visits.

#### **What options do I have if the cancer comes back?**

It depends where the cancer comes back. If it recurs in the prostate itself, local treatments such as surgery, seed brachytherapy, and cryotherapy are all possible solutions although each carries increased risk of complications and side effects. If it recurs outside of the prostate (in the lymph nodes or bones, called metastases), systemic treatments which can affect tumor cells anywhere in the body, such as hormonal therapy, chemotherapy, and perhaps some newer molecular and immune system therapies, are indicated.

## Brachytherapy

Prostate brachytherapy is the implantation of small radioactive pellets, or “seeds,” into the prostate (see Figure 5). The radioactive seeds deliver high doses of radiation to a very confined region, making it possible to deliver a higher dose of radiation to tumor cells within the prostate while sparing the adjacent normal organs such as the bladder and rectum. Brachytherapy can be used by itself or in combination with external beam radiation therapy to treat prostate cancer. Physicians at the Peninsula Cancer Center were the first in the Northwest area to use the most advanced technique for prostate brachytherapy known as real-time dosimetry brachytherapy. This technique allows placement of radioactive seeds into the prostate with millimeter accuracy. Older methods of prostate seed implants require a preoperative rectal ultrasound study in which the patient’s position must be matched exactly at the time of implant (up to one month later). Matching this position in the operating room is often difficult and can result in inaccurate placement of the seeds. Using the real-time technique, patients do not require a preoperative rectal ultrasound in the doctor’s office. This technique also improves the accuracy of seed placement by using a computer system in the operating room to map the prostate gland. The position of each seed can be precisely tracked, ensuring the proper radiation dose within the prostate. Equally important, this technique helps doctors avoid placement of seeds near normal tissues such as the bladder, urethra and rectum, further reducing side-effects. Studies have shown this technique to be superior to the older method of implant known as the “preplanning” technique.

Before the procedure, patients undergo general or spinal anesthesia. A urinary catheter is then placed into the bladder. An ultrasound probe, similar to the one used for the prostate biopsy, is then placed into the rectum. The ultrasound is used to help accurately guide hollow needles through the skin of the perineum (the space between the anus and the scrotum) and into their proper position within the prostate. The seeds are then placed into the prostate through each needle. As each needle is withdrawn, a row of seeds is left

behind. The entire procedure is done typically in 45 to 60 minutes. It is performed as an outpatient procedure. Patients are usually discharged with the urinary catheter in place and are given instructions on how to remove it the next morning after the procedure. The first follow-up exam is usually scheduled one month after the procedure. During that visit, a CT scan will be performed to check the position of the seeds and insure that the prostate has received the proper dose of radiation (see Figure 6 on following page).

The seeds give off their radiation according to their half-life and then become inactive. They are left in the prostate permanently and do not cause any harm to the body. The radioactive isotopes used for prostate brachytherapy include iodine-125, palladium-103 and cesium-131, which have half-lives of 60, 17 and 9 days, respectively. The amount of radioactivity that escapes the body is exceedingly small. However, as a safety precaution, we recommend that small children and pregnant women do not sit on or next to the patient for 1-2 months. Metal detectors (such as those in an airport) will not pick up the presence of the seeds, but radiation detectors will during the first 5-6 half-lives of the seeds. Radiation detectors are commonly used at border crossings (between the US and Canada/Mexico) as well as international airports (such as the Seattle-Tacoma International Airport). Patients are given a medical alert card which describes the type and date of the procedure as well as the isotope used. It should be carried by the patient whenever traveling internationally for the first 3-12 months (depending on the isotope used) after the procedure.

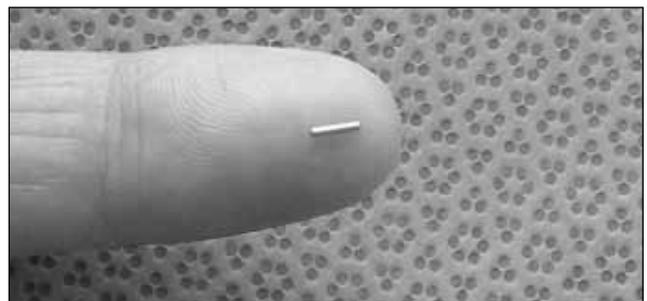


Figure 5 – radioactive seed



Figure 6 – CT scan of the prostate one month after implant

### Side Effects of Brachytherapy

As with external beam radiation therapy, side effects from brachytherapy can be divided into early and late effects. Immediately after the procedure, patients may have some perineal discomfort and even some bruising for a few days. The urinary catheter can also cause some irritation which sometimes can be alleviated by application of a small amount of antibiotic ointment around the catheter at the tip of the penis. Patients often experience increased urinary frequency, urgency, weak stream and nighttime urination. These effects are at their greatest for four-six weeks after brachytherapy and will dissipate over the following 3-12 months. Medications are provided to help alleviate these symptoms. Late effects (occurring months to years after the procedure) such as urinary incontinence or stricture are rare. Proctitis (rectal inflammation) can also occur, but rarely requires treatment. The rates of potency after brachytherapy are slightly higher than with external beam radiation, but are highly dependent upon patient age and erectile function before treatment. Medications known as PDE-5 inhibitors (e.g. Viagra<sup>®</sup>, Cialis<sup>®</sup> or Levitra<sup>®</sup>) are often helpful in improving potency.

## FREQUENTLY ASKED QUESTIONS ABOUT BRACHYTHERAPY

### How will I feel after a seed implant?

You will have some swelling in the perineal area (the skin between the scrotum and the anus), so you should use a soft chair or couch when sitting. You may also notice some bruising in the same area which could extend up onto the scrotum and even the base of the penis. The swelling and bruising will subside in a few days after the procedure. We recommend that you take a few days off of work and avoid strenuous activity for 3-5 days. You may resume normal activity at that point.

### Does a prior TURP affect my candidacy for seed implant?

Possibly. Very large TURP defects make it difficult to place seeds in the proper position within the prostate gland. Often times, however, the defect is small enough that, with careful planning using a real-time dosimetry technique, your doctors can still effectively deliver treatment to the prostate cancer.

### How soon after seed implant can I have sex?

You can have intercourse as soon as you feel able. However, we recommend you use a condom for the first three-four times or first month after your procedure. Sometimes the ejaculate can be bloody or discolored. Over time, the volume of ejaculate will decrease and could eventually dry up. This is normal and occurs over 3-12 months.

### How do I know if the treatment worked?

Similarly to external beam radiation therapy, regular PSA follow-up is necessary, and the PSA will typically nadir below 1.0 ng/mL in 6-18 months after treatment. In about 25% of men, the PSA could rise briefly and then drop back down to its baseline level. This typically occurs 1-3 years after treatment and is called a "benign PSA bump."

### **What options do I have if the cancer comes back?**

As with external beam radiation therapy, it depends where the cancer returns. A recurrence in the prostate itself is rare (about 3% chance). However, if the cancer does come back in the prostate, surgery or cryotherapy are possible treatment options. A recurrence outside of the prostate (in the lymph nodes or bones) requires systemic treatments such as hormonal therapy, chemotherapy and possibly newer molecular or immune system therapies.

### **Hormone (Androgen Deprivation) Therapy**

Hormone therapy is also called androgen deprivation therapy (ADT) or androgen suppression therapy. Androgens (testosterone and dihydrotestosterone) are produced mainly in the testicles and stimulate prostate cancer cells to grow. Lowering androgen levels often stops or significantly slows the growth of prostate cancer cells, although it does not cure prostate cancer. Over time (usually years), the prostate cancer can develop a resistance to this therapy and begin to grow again. Reducing androgen levels is accomplished mainly by medications, but can also be achieved by removal of the testicles (castration).

### **Hormonal therapy can be used in several different situations:**

- If, at the time of diagnosis, the cancer has already spread beyond the prostate gland
- If the cancer remains or returns after initial treatment with surgery, radiation or cryotherapy
- In combination with radiation therapy as initial treatment for aggressive prostate cancer
- Before seed brachytherapy in order to shrink the prostate to make it possible to place the seeds

### TYPES OF HORMONE THERAPY

**Orchiectomy** – a surgical procedure in which the testicles are removed. The testicles produce 90% of the androgens and, with this source removed, most prostate cancers will stop growing for a time. This maneuver, however, is permanent.

### **Luteinizing hormone-releasing hormone (LHRH) analogs**

– these medications can decrease androgen production by inhibiting the release of testosterone by the testicles. Treatment with these drugs is sometimes called “chemical castration” because they lower androgen levels equally as well as orchiectomy. However, their effects are reversible. LHRH analogs are injected under the skin and are given every one, three, four or 12 months. The LHRH analogs available in the United States include leuprolide (Lupron, Eligard, Viadur), goserelin (Zoladex), triptorelin (Trelstar) and histrelin (Vantas). When these medications are first administered, they cause a brief increase before causing the desired decrease in testosterone levels. This effect is called a “flare.” The flare can be a problem in men with the spread of cancer to the bones. Some patients can experience a short-term growth of the cancer causing pain, or even neurologic problems like paralysis if the cancer has spread to the spine. This problem can be avoided by giving drugs called anti-androgens (see below) for a few weeks when starting treatment with the LHRH analogs.

### **Luteinizing hormone-releasing hormone (LHRH) antagonists**

– these medications bind to receptors in the pituitary gland reducing the release of luteinizing hormone (LH) from the pituitary, which then leads to a reduction of testosterone release from the testes. LHRH antagonists reduce testosterone levels more quickly and do not cause the flare like the LHRH analogs. The LHRH antagonist available in the United States is degarelix (Firmagon) and is available as a monthly injection.

**Anti-androgens** – even after orchiectomy or LHRH analog therapy, a small amount of androgen is still produced by the adrenal glands. Anti-androgens block the body's ability to use androgens. These drugs, such as flutamide (Eulexin), bicalutamide (Casodex), and nilutamide (Nilandron), are taken daily as oral pills. They are often used (for 2-3 weeks) to block the testosterone flare caused by the initiation of LHRH analogs (see above).

**Other androgen-suppressing drugs** – estrogens were once used frequently for advanced prostate cancer. Due to their side effects (such as blood clots and breast enlargement) and the development of the above mentioned medications, estrogens are now used infrequently. Ketoconazole (Nizoral) is a medication used to treat fungal infections, but also can block the production of androgens from both the testicles and the adrenal glands by inhibiting a number of enzymatic pathways. It can be used in patients whose cancer has progressed while on the above forms of androgen deprivation therapy. Patients usually must also take a corticosteroid (like hydrocortisone) in order to prevent side effects due to low cortisol levels caused by ketoconazole.

### **Side Effects of Hormone Therapy**

The side effects of orchiectomy, LHRH agonists and LHRH antagonists are similar and are due to a reduction in testosterone levels. These side effects include:

- Hot flashes
- Reduced libido (sexual desire)
- Impotence
- Weight gain
- Breast tenderness or enlargement
- Loss of muscle mass
- Fatigue
- Osteoporosis (decreased bone density)
- Anemia (low red blood cell count)

Risk of developing diabetes and possibly cardiovascular disease is also higher in men treated with ADT.

The side effects of the anti-androgens are similar to the above. However, when these drugs are used alone, libido and potency can often be preserved. When used in combination with LHRH agonists, patients can experience diarrhea and nausea. Anti-androgens can also cause liver inflammation.

Many of the side effects of hormonal therapy can be prevented or treated. Hot flashes can be treated with various over-the-counter remedies as well as certain prescription antidepressants. Breast enlargement can be prevented with a short course (three treatments) of radiation. Exercise can be helpful in reducing fatigue, weight gain and loss of muscle mass and is highly encouraged. Osteoporosis can be monitored with bone density scans and treated with calcium, vitamin D and other drugs. Anemia is typically mild and usually does not require treatment.

### **Intermittent Hormonal Therapy**

When androgen deprivation therapy is used to treat recurrent, persistent or metastatic (spread of tumor outside the prostate) disease, it can be used on a continuous or intermittent basis. All prostate cancer treated with hormonal therapy eventually becomes resistant to this treatment typically over a period of years. Some physicians believe that continuous exposure to hormonal drugs might lead to a faster development of hormone resistance. Therefore, intermittent therapy (e.g. treatment for six months, followed by a six month break, followed by another six months of treatment, etc.) has been thought to lengthen the time before the tumor becomes hormone resistant. In addition, another advantage of the intermittent therapy is that the side effects of hormonal therapy can be minimized since the patient is not continuously exposed to the treatment.

### **DIET, NUTRITION AND PROSTATE CANCER**

Increasing attention is being devoted to understanding the role of diet and nutrition in relation to the development and progression of prostate cancer. Diet is perhaps the most important factor that can be controlled by an individual.

#### **Obesity and Dietary Fat**

Many studies have shown that obese men have a greater risk of dying from prostate cancer, developing a more aggressive cancer, and experiencing disease recurrence after surgery or radiation therapy. The Cancer Prevention Study demonstrated that men with a body mass index (BMI) of greater than 32.5 kg/m<sup>2</sup> were 35% more likely to die of prostate cancer than men whose BMI was less than 25. Interestingly, many studies of survival rates after prostate cancer treatment have found that most patients die from causes other than prostate cancer, most commonly cardiovascular disease. This would suggest that dietary measures to reduce obesity and thus cardiovascular disease would also help to maximize the benefit from undergoing prostate cancer treatment.

Per-capita fat consumption is highest in North American and Western European men; rates of prostate cancer deaths are also highest in these groups. Conversely, countries in the Pacific Rim have the lowest death rates and the lowest fat consumption. Interestingly, with the introduction of a more "Western" diet in Japan, where the traditional diet is low in fat, there has been an increase in the incidence of aggressive prostate cancer. Whittemore et al studied the relationship of diet, physical activity, and body size in black, white, and Asian men living in North America. The only factor that correlated with prostate cancer was the amount of dietary fat. In another study by Giovannucci et al, it was found that men who consumed high levels of fat were more likely not only to develop prostate cancer but also to develop a more aggressive form of the disease.

### **Dietary nutrients and supplements**

There are a variety of dietary nutrients and supplements that may reduce the risk of developing prostate cancer. They are readily available in foods and are generally thought to be better if ingested as food rather than as an artificial supplement.

**Carotenoids** – Carotenoids are micronutrient antioxidants found in orange or yellow fruits and vegetables. The most common dietary carotenoids include beta-carotene, alpha-carotene, beta-cryptoxanthin, lutein, zeaxanthin, and lycopene. Lycopene is the most efficient antioxidant in this group and is the predominant carotenoid in the plasma and in various tissues, including the prostate. It is found in watermelon, tomato, and all tomato-based products, pink grapefruit, apricots, papaya, guava and persimmons. Carrots contain high levels of carotene, but contain little lycopene. Some studies have shown a decreased risk of developing advanced prostate cancer with a high intake of tomato products (> 10 serving per week). Cooked tomato products seem to have a greater effect than raw tomato products.

**Cruciferous vegetables** – Broccoli, cauliflower, brussel sprouts, bok choy, cabbage and kale contain high levels of sulforaphane and indole-3 carbinol, which possess anticarcinogenic properties. These nutrients can induce the production of antioxidant enzymes that can protect cells from oxidative damage. They have also been shown to induce apoptosis in damaged cells as well as exhibit antiproliferative and antimetastatic properties.

**Vitamins and minerals** - Vitamin E is a lipid-soluble antioxidant found in vegetable oils, nut oils, hazelnuts, sweet potatoes, whole grains, and leafy vegetables. Some studies, such as the Alpha-Tocopherol, Beta-Carotene cancer prevention trial have demonstrated a reduction in prostate cancer incidence and mortality, while others, such as the Prostate, Lung, Colorectal and Ovarian Screening trial, have not shown a significant benefit. Selenium is a trace element that is a component of multiple antioxidant enzymes.

Epidemiologic studies indicate that selenium is a potential prostate-cancer preventative and decreases the growth rate of prostate-cancer cells. Plasma, serum, and tissue levels of selenium are inversely associated with the risk of developing prostate cancer. Selenium is found in Brazil nuts, walnuts, fish (including canned tuna and shellfish), beef, turkey, chicken, eggs, whole grains, garlic, onions, broccoli, cabbage, and mushrooms. The SELECT trial is studying the effects of selenium and vitamin E alone and in combination. This study has enrolled 35,000 men. Results should be available by 2012. Vitamin D deficiency has also been correlated with increased risk of cancer incidence and mortality. The major and most important source of vitamin D is sunlight but is also contained in dairy products, eggs, vitamin D-fortified cereals, and fatty fish such as salmon and tuna. Many men are vitamin D deficient, and this substance can readily be measured in the serum.

**Isoflavones** - Soy is a rich source for the isoflavones genistein, daidzein, and equol, which have been shown to affect cell-growth pathways and angiogenesis. Isoflavones have also been shown to affect the production and metabolism of androgen and estrogens, which play an important role in the development and progression of prostate cancer. The traditional Western diet entails minimal soy consumption, and few epidemiologic studies that provide useful recommendations have been performed as a result. Isoflavones studied in animal studies indicate a beneficial effect in the prevention and reduction in the growth rate of prostate cancer.

**Polyphenols** - Polyphenols are found in varying amounts in most fruits and vegetables, as well as green tea and red wine. These agents act via antioxidant, antiproliferative, and antiangiogenesis pathways. Some of the more popular polyphenols have been the catechins in green tea, which have been shown to inhibit cancer-cell growth in both animal and epidemiologic studies.

## **SUMMARY**

Although diet and nutrition appear to play a role in the development of prostate cancer, no specific diet has been shown to prevent or alter the growth of an existing cancer. Most recommendations for a prostate healthy diet, however, are very similar to a heart healthy diet and would be beneficial to most men. Although there are many supplements that are pharmacologically or synthetically produced containing the above mentioned micronutrients, consumption in their naturally occurring state in food is likely to be of greatest benefit. You should discuss your diet and any supplements you are taking with your doctors before, during and after any treatment for your prostate cancer.

## **PROSTATE CANCER WEBSITES**

The following websites are considered reputable sources with information and links that you may find helpful in learning more about prostate cancer.

### **American Cancer Society (ACS)**

[www.cancer.org](http://www.cancer.org)

### **Memorial Sloan Kettering Cancer Center**

[www.mskcc.org](http://www.mskcc.org)

### **Medline Plus**

[www.nlm.nih.gov/medlineplus/prostatecancer.html](http://www.nlm.nih.gov/medlineplus/prostatecancer.html)

### **National Cancer Institute (NCI)**

[www.cancer.gov](http://www.cancer.gov)

### **National Comprehensive Cancer Network (NCCN)**

[www.nccn.org](http://www.nccn.org)

### **Oncolink**

[www.oncolink.upenn.edu](http://www.oncolink.upenn.edu)

### **Peninsula Prostate Institute**

[www.peninsulaprostateinstitute.com](http://www.peninsulaprostateinstitute.com)

## **PROSTATE CANCER SUPPORT GROUPS**

The following are local and regional prostate cancer support groups and their contact information.

POULBSO PROSTATE CANCER  
SUPPORT GROUP CONTACTS:

### **Jim Boyden**

360.613.0454

[jimesmc@att.net](mailto:jimesmc@att.net)

### **Jerry Jurgens**

360.779.4271

[jjurgens@silverlink.net](mailto:jjurgens@silverlink.net)

### **Jerome Denberger**

USN-Ret 360.373.0839

[jndenberger@aol.com](mailto:jndenberger@aol.com)

**Remember the PPI staff is here  
to support you as well.**

## PERSONAL RECORD

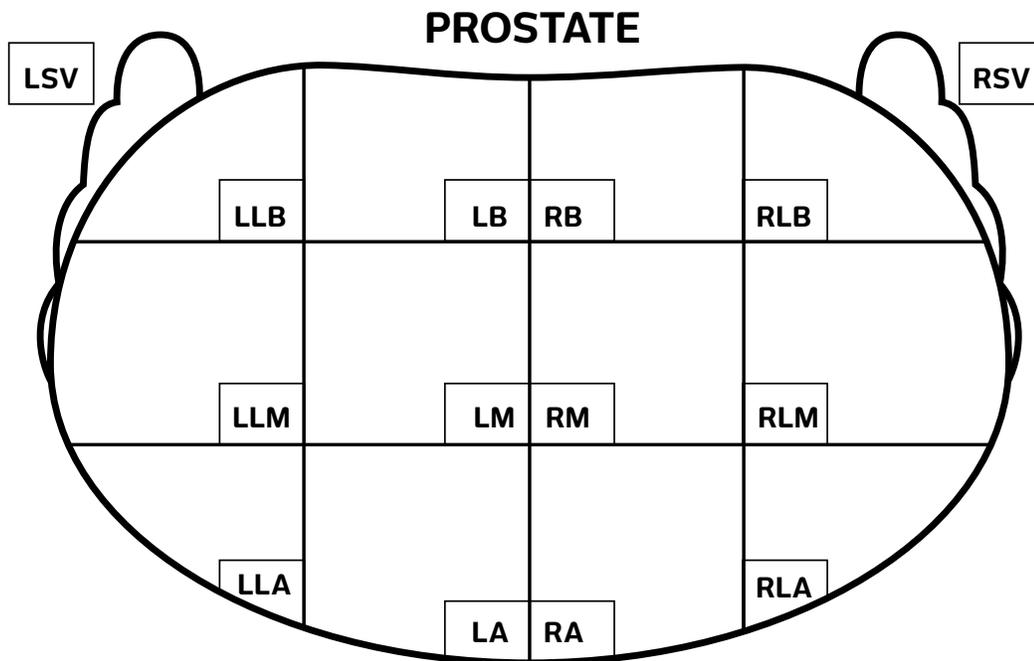
Name: \_\_\_\_\_

PSA (Prostate Specific Antigen): \_\_\_\_\_

Gleason Score: \_\_\_\_\_

Clinical Stage: **T**    **N**    **M**    Stage \_\_\_\_\_

### Biopsy Results:



### Risk Assessment:

(for spread outside the prostate gland and lymph node involvement)

\_\_\_\_\_ Low

\_\_\_\_\_ Intermediate

\_\_\_\_\_ High

## NOTES