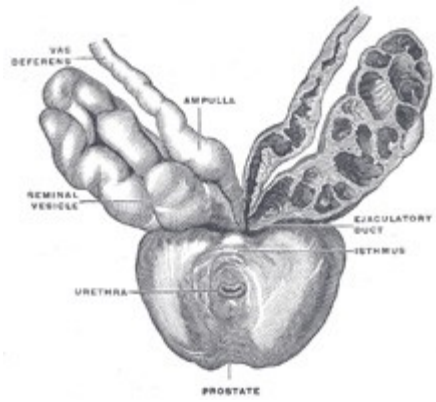
PROSTATE CANCER INFORMATION KIT



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The Prostate

What is the Prostate?

The prostate is a gland found only in men and is usually the size and shape of a walnut. It is found at the opening of the bladder and surrounds the tube (urethra) that you void through. Its primary function is to produce the fluid in semen which is secreted during orgasm.

What happens to the Prostate during aging?

As men age, there are several changes that occur in the prostate. Most men have had some enlargement of the prostate by the age of 50. As the prostate enlarges in a process known as Benign Prostatic Hyperplasia (BPH), the position of the prostate at the neck of the bladder causes some restriction in the stream resulting in a slow and weak stream as well as frequent urination.

A second condition that occurs in men more frequently as they age is a tendency towards inflammation of the prostate known as prostatitis. This condition also causes swelling of the prostate resulting in a slow and weak stream as well as frequent urination and urgency.

The third possible condition of the prostate with aging is prostate cancer. It is estimated that as many as 1/3 of men aged 50 will have some microscopic changes in their prostate that is cancerous.

How is Prostate Cancer Diagnosed?

Prostate cancer is usually diagnosed based upon either a physical examination of the prostate or by an elevation of a blood test. There are no symptoms of prostate cancer in patients who have curable cancer that distinguish cancer from either BPH or prostatitis. Since the 1990's, most prostate cancer is diagnosed by a blood test measuring Prostate Specific Antigen (PSA). Despite the fact that PSA is a highly sensitive test, there remain up to 20% of patients who are diagnosed based upon a digital rectal examination (DRE).

When should I start screening for Prostate Cancer?

The American Cancer Society and the American Urologic Association recommend that all males over the age of 50 should be screened for prostate cancer with both a serum PSA and a digital rectal examination. In patients who are at high risk for prostate cancer, such as African Americans and relatives of Prostate Cancer patients, the screening should probably start earlier.

What is PSA and how is it used?

PSA is a blood test that is used to screen for prostate. The test measures a protein that is secreted by the prostate (Prostate Specific Antigen). Anything that happens to the prostate, such as enlargement, inflammation, infections, or cancer will all make the PSA go up.

What is the meaning of an elevated PSA?

An elevation of the serum PSA may be due to a number of factors. Nearly 80% of patients who have an elevated PSA do not have cancer as the cause. Instead, these patients may have an infection or inflammation of the prostate or just enlargement of the prostate (BPH). Despite the fact that only 20-25% of patients with elevated PSA have cancer, this is more accurate than mammography or other cancer screening tests.

What are the normal ranges for PSA?

For the average male in the United States, the normal PSA should be below 4ng/ml. However, young men tend to have a smaller prostate and the PSA can be adjusted for the patient's age. For example, a man under the age of 60 years should have a PSA under 3ng/ml, while men over the age of 70 may have PSA's up to 6.5ng/ml.

Is there other information that PSA can diagnose cancer?

Some cancers are now picked up by watching the PSA rise with time. This is called PSA Velocity and generally is reflected as a faster than expected rise in PSA. If your prostate is rising faster that 20% per year, then you may want to have an ultrasound of the prostate.

What should be done about an elevated PSA or abnormal digital rectal examination?

If either the PSA or digital rectal examination is abnormal, the patient should be evaluated by a Urologist. The patient will be checked to be sure that there is no inflammation or infection and treated if there is evidence that the prostate is inflamed. If there is no evidence of an inflammation or infection, the Urologist will usually recommend an ultrasound and biopsy of the prostate.

What is a Prostate Ultrasound?

A prostate ultrasound is a procedure where the Urologist places an ultrasound probe within the rectum and images the prostate by sound waves similar to radar. The Urologist is looking at the size of the prostate as well as for any tissue abnormalities. The ultrasound can be further utilized to perform biopsies of the prostate.

What side effects can I expect after a Prostate Ultrasound?

There are 3 specific sided effects that are seen after prostate ultrasonography. The first and most common is blood in the urine and rectum. This is usually not a major problem and stops within 2 or 3 days after the biopsy. Some patients may see clots in their urine which clear up with increasing the fluid intake. Blood in the semen is very common and can occur even weeks after the biopsy.

The second common side effect to a prostate biopsy is infection. These are fairly uncommon, but may be associated with a fever and chills as well as burning and frequency of urination. If a patient experiences a fever or chills after a biopsy, they should call the Urologist.

The third side effect after a prostate biopsy is difficulty urinating. This is usually because of swelling of the prostate due to a reaction to the biopsy, but can be related to a blood clot in the bladder. Again, this is something that the patient needs to communicate with his Urologist as soon as possible.

PROSTATE CANCER

What is Prostate Cancer?

Prostate cancer is an uncontrolled growth of the cells in the prostate gland. Initially, the cancer is a few cells, but as it grows, it replaces the normal prostate and eventually migrates out of the prostate. When prostate cancer spreads, it usually goes to the lymph nodes and the bone.

How Common is Prostate Cancer?

Prostate cancer is the most common cancer in adult men. In 2007, the American Cancer Society estimates that there will be approximately 219,000 men diagnosed with prostate cancer in the United States. The chance of a man developing prostate cancer during his life time is 1 in 6. There will be over 27,000 men who will die of prostate cancer in the United States in 2007 which accounts for 10% of all cancer deaths.

What are the Risk Factors for Prostate Cancer?

The most common risk factor in developing prostate cancer is age. The likelihood of a 50 year old man having cancer in his prostate is 1 in 3. The likelihood of an 80 year old having cancer in his prostate is 80%. This does not mean that all of these men will develop clinical prostate cancer, but 2/3 of all prostate cancers reported in the United States are in patients over the age of 65.

The second most common risk factor is race. The incidence of prostate cancer in African American men is significantly higher than in White men of the same age. In addition, the cancers in African Americans typically presents at a more advanced stage and the African American man is more likely to die of prostate cancer than similarly staged White men. The incidence of prostate cancer in Asian men is considerably lower than in White males.

The third most common risk factor is a family history of prostate cancer. Men who have a father or brother with prostate cancer are twice as likely as the average population to develop prostate cancer. If there is more than 1 member of the immediate family with prostate cancer, the likelihood of developing prostate cancer increases to as much as 5 times the average population.

Diet is another contributing factor to prostate cancer. Some studies have shown that increased fat in the diet is associated with an increased risk of prostate cancer. Studies to reduce fat in the diet, however, have shown a benefit only if the patient's cholesterol was also reduced. Certain nutrients such as soy, selenium, lycopenes, zinc, and antioxidants have all shown some activity in prostate cancer.

How is Prostate Cancer Diagnosed?

Prostate Cancer is diagnosed by a biopsy of the prostate. This is usually done by ultrasound guidance and a sample of each region of the prostate is taken.

What does the Biopsy Report mean?

The biopsy report will usually give information as to whether the tissue in each region of the prostate was normal, abnormal, or cancerous. Some pathologists will further give information as to the amount of cancer seen in each specimen. The pathologist will also grade the cancer with a Gleason Score.

What is the "Gleason Score"?

The Gleason Score is a system of describing the growth pattern of the cells within the prostate cancer. There are 5 different patterns of growth and each is numbered 1 through 5. The pathologist will report the most common pattern seen as the first number and the second most common pattern as the second number. The Gleason Score is a combination of these 2 patterns added together. The lowest Gleason Score is 2 (1+1) and the highest is 10 (5+5). The most common scores are Gleason 5, 6, or 7.

The Gleason Score serves as a tool to estimate the aggressiveness of the cancer with the highest numbers (8, 9, or 10) being the most aggressive. This also allows the Urologist to estimate the chances of the cancer being confined to the prostate and therefore plan the treatment.

What does "stage" of the cancer mean?

The stage of the cancer is a description of how far the cancer has spread. This is usually done by a series of tests including the digital rectal examination, the ultrasound pictures, the Gleason Score, and the PSA level. There are 2 systems of staging used in the world, though the most common one is the TNM system which allows description of the extent of the local tumor as well whether it has spread beyond the prostate. As far as treatment decisions, however, the key is whether the cancer is confined to the prostate or not.

What other tests are done to stage the cancer?

Other tests can also be performed to try to determine the stage of the cancer including CT scans, bone scans, PET scans, and Prostascint cancers. In the newly diagnosed prostate cancer patient, these studies generally do not add any information that cannot be obtained by looking at the PSA and DRE. High risk patients (Gleason Scores 8, 9, or 10), PSA over 20, or patients with extensive disease may benefit from these studies and will most likely need a lymph node biopsy. Patients who are low risk generally do not need any of these studies including a lymph node biopsy.

What options are available for treating my cancer?

The treatment options for prostate cancer depend upon how advanced the cancer is. If the cancer is contained within the prostate, then the options are observation, hormonal therapy, radiation therapy, surgery, or cryotherapy. If the cancer is outside the prostate, then the best options are observation, hormonal therapy, or radiation. Generally neither observation nor hormonal therapy alone will result in a long term cure.

Observation or Watchful Waiting

What is Watchful Waiting?

Watchful Waiting is also known as Observation or Active Monitoring. This means that no treatment will be started unless the cancer starts to progress.

Who is a candidate for Watchful Waiting

Generally, men who have a relatively short life expectancy (less than 5 years), are elderly, or who do not want to have active treatment with low risk cancer are all candidates for Watchful Waiting. Compared to other cancers, prostate cancer is relatively slow growing. This means that if there are other medical problems that will cause the patient to die in the next 5 years, then treating the cancer will not be of any benefit in terms of long term survival. Older men (over the age of 80) generally have a less aggressive form of cancer and are at higher risk of complications. Low risk cancers (Gleason score 2, 3, or 4) are also generally slow to progress and in older patients may be candidates for Watchful Waiting. There are some recent studies in patients with small volume cancer that show that these patients may also be a favorable group, but this is not generally accepted at this time.

What is the frequency of visits and what is involved?

Initially the visits will be fairly frequent (every 3 months) to determine how fast your PSA is rising. Once a trend is established, the frequency of visits will decrease. The initial testing will be by PSA and digital rectal examination. If the PSA exceeds 20ng/ml, then you will start having bone scans.

At what time would any treatment be started?

Treatment can start at any time, but is usually started when there is evidence of progression of the cancer. Sometimes, this is just a rise in the PSA but usually is a change in the bone scan. Symptoms of progression such as pain or difficulty urinating may also be cause treatment to be started.

What treatments are available if the cancer progresses?

The usual treatment for progressive cancer in Watchful Waiting is hormonal therapy. Though surgery and radiation therapy are other treatment options, they are more successful if started when the cancer is diagnosed. Therefore, if you plan to have either surgery or radiation therapy in the future, then Watchful Waiting may not be a good option for you.

Hormonal Therapy

What is Hormonal Therapy?

Hormone Therapy is a treatment that removes the male hormones that will cause the prostate cancer to grow. Male hormones are made in the testicles and adrenal glands and are a cause of enlargement of the prostate as well as contribute to the growth of prostate cancer.

When is Hormonal Therapy used?

Hormonal Therapy is used in many instances in the treatment of prostate cancer. It can be used as the only treatment to try to control the cancer, as a means of shrinking the cancer to make other treatments such as radiation more effective, and for cancer that has spread for both control of the growth of the cancer as well as reduction in cancer caused pain or other symptoms.

What is involved in Hormonal Therapy?

Hormonal Therapy can be done in a variety of ways. One option is removal of the testicles (castration). This will require a surgical procedure and is not reversible.

A second form of Hormonal Therapy is injections or implantation of a drug called an LHRH agonist. These drugs are designed to stop the production of the male hormones in the testicles. These drugs have the advantages in that they can be stopped and the side effects will improve. They are available in a 1 month, 3 month, 4 month, 6 month, or 1 year preparation.

A third type of Hormonal Therapy is taken as tablets that block the action of the male hormones on the prostate cells. These tablets have the advantage that they can block the hormone stimulation of the prostate, but generally do not last as long as the injections.

There are certain times when the treatment calls for a combination of both the injections and the oral tablets. This is called total androgen blockade and may be for a short time or a lengthy time depending upon the circumstances.

Who is a candidate for Hormonal Therapy?

Anyone with prostate cancer is a potential candidate for Hormonal Therapy. Usually, however, hormonal therapy is used for patients who are not candidates for either radiation or surgery, patients whose prostates are too large for treatment, patients with high risks who are about to undergo radiation therapy, or patients with cancer that has spread.

Some patients are either too old or too debilitated to warrant radiation therapy or surgery for their prostate cancer. In these patients, there is debate as to whether early treatment with Hormone Therapy is better than Watchful Waiting and treating them if the cancer progresses. In addition, some patients do not want more aggressive treatments such as radiation or surgery and yet want something done who are also candidates for Hormonal Therapy.

The final group of patients who receive Hormonal Therapy are those who have cancer that has spread, especially if the cancer is causing pain. Prostate cancer will frequently spread to the bone and the early used of Hormonal Therapy will reduce the chance of fractures and improve the pain from the cancer.

What is the “flare” and how is it prevented?

The “flare” is a sudden rise in the male hormone levels when the first injection of LHRH-agonists is given. This is because the initial injection will cause the pituitary gland to release a large amount of hormone that will stimulate the testicles to make a large amount of

testosterone. This "flare" is not seen with any other type of Hormonal Therapy and is only after the first injection. The sudden rise of the male hormone levels can be associated with a sudden increase in bone pain from the cancer.

The "flare" can be prevented by using the oral tablets prior to the injection of the LHRH-agonist. Generally a week of the tablets before the injection and 2 weeks after the injection (3 weeks total) will block the "flare"

When is Hormonal Therapy used with Radiation Therapy?

When a patient is considering Radiation Therapy, there are 2 situations where Hormonal Therapy may provide a benefit. The first is the patient with a very large prostate. Many studies have shown that reducing the size of the prostate is beneficial to allow a better result from the radiation therapy. These patients are generally given a several month course of Hormonal Therapy and the size of the prostate is measured again by ultrasound. Once the size of the prostate is in the range (generally less than 60 grams), the Hormonal Therapy is stopped.

The second situation is the patient who has a high Gleason Score (8, 9, or 10) or other factors that make them a high risk for recurrence (PSA over 10 or many biopsies positive for cancer). These patients are usually treated for 2-3 years with Hormonal Therapy which significantly improves their chances of a cure.

What are the side effects of Hormonal Therapy?

Every patient may have a different set of side effects from their treatment, though many of the side effects are predictable. In addition, the side effects experienced will vary in intensity from patient to patient. The most common side effects are on sexual function, hot flashes, and loss of energy.

Sexual side effects are usually loss of the ability to achieve an erection (Erectile Dysfunction) and loss of the desire or interest in sexual relations (libido). These side effects will generally improve after stopping hormonal therapy though it may take 6 months to a year.

Hot flashes are common with hormonal therapy and can be a minor irritation or a significant side effect. Hot flashes will improve with time in most patients and do not usually require any additional treatment.

Loss of energy is a nonspecific complaint that many patients will experience. This may be related to a lower metabolism, but can be due to many other factors including depression. This is usually worse in the first few weeks of treatment.

Osteoporosis is a side effect of prolonged treatment with Hormonal Therapy. This is a thinning of the bones and can lead to fractures. Osteoporosis is seen mainly in patients who have been treated for more than 6 months with Hormonal Therapy.

Other side effects of Hormonal Therapy include swelling or tenderness of the breasts and weight gain. Diarrhea and nausea are sometimes seen with certain oral tablets.

What is "Intermittent Hormonal Therapy"

Intermittent Hormone Therapy is the treatment for a period of time, then stopping the treatment, and then restarting the treatment. There are 2 reasons for using this treatment which include lowering the risks of osteoporosis and prolonging the time that the Hormone Therapy is effective. There is debate as to whether this treatment will actually provide the benefits and the use of Intermittent Hormonal Therapy is not generally accepted.

Should I be monitored for osteoporosis?

The true incidence of osteoporosis with Hormonal Therapy is not yet known. Most Urologists, however, agree that patients who are on Hormonal Therapy for years may benefit from a Bone Density Scan.

What are the chances of Hormonal Therapy curing my cancer?

There is a high chance that prostate cancer will initially respond to Hormonal Therapy. The length of time that this response lasts, however, is highly variable from patient to patient. Generally, most patients will have a response lasting about 2 years. Long term responses and cures are relatively rare with Hormonal Therapy alone.

What is "Hormone Resistance" and what are the options for treatment?

"Hormone Resistance" is the point at which the cancer no longer responds to the Hormonal Therapy. This usually results in a rise in the PSA and progression of the cancer on the bone scan. Sometimes additional hormonal agents will help, but many patients will require chemotherapy to try to control the cancer.

Drug	How Given	How Often
Lupron	**Injection**	**1 or 4 months**
Eligard	**Injection**	**1, 3, 4, or 6 months**
Zoladex	**Injection**	**1 or 4 months**
Trelstar	**Injection**	**1 or 3 months**
Viadur	**Implant**	**12 months**
Vantas	**Implant**	**12 months**
Casodex	**Tablet**	**Daily**
Eulexin	**Tablet**	**Daily**
Nilandron	**Tablet**	**Daily**

External Beam Radiation Therapy

What is External Beam Radiation Therapy?

External Beam Radiation Therapy (EBRT) is a technique of delivering radiation treatments via a machine that delivers focused high energy Xray beams. The machine that delivers the radiation is called a linear accelerator.

How does Radiation Therapy treat prostate cancer?

The aim of Radiation Therapy is to destroy cancer cells in the treated area, while limiting any damage to the normal cells. High energy X-ray beams are directed at the prostate from outside the body. These beams damage the cells and stop them from dividing and growing. Cancer cells are not able to recover from this damage and die, but normal healthy cells can repair themselves more easily. The whole prostate gland is treated, including the area surrounding the gland to make sure that any stray cancer cells are treated.

Who is a candidate for External Beam Radiation Therapy?

External Beam Therapy is used both to cure prostate cancer as well as to treat advanced cancers. When used as a treatment to cure the cancer, External Beam Therapy is usually used for anyone with a life expectancy of 5 or more years. The treatment in these patients is aimed directly at the prostate.

When used for treatment of advanced cancer, External Beam Therapy is used to reduce the pain or to prevent a fracture of bones. When used for advanced cancer, External Beam Therapy can be used in any patient with prostate cancer**.**

What is the benefit of External Beam Radiation Therapy?

One benefit of External Beam Therapy is that it can be performed without the need for anesthetic and is noninvasive. A second benefit is that the area treated with External Beam Therapy can be expanded to the area adjacent to the prostate which allows treatment of high risk cancers.

What are the side effects of External Beam Radiation Therapy?

As with any cancer treatment, there are both short term and long term risks. The short term risks are generally seen during the treatments and resolve over a period of less

than 6 months. Usually the side effects of treatment are fairly mild and well tolerated. The chief side effects are irritation of the bowels, irritation of the urinary tract, feeling tired, and sexual problems.

The bowel and rectum are exposed to radiation because they are close to the prostate and the area being treated. While in many men this may not cause any problems, in some it may cause the lining of the bowel to become inflamed. The symptoms usually start during the second or third week of treatment. The symptoms usually improve in a couple of weeks after you complete your treatment, but it is possible that some of the symptoms become permanent. Before you start radiotherapy, tell your specialist if you have ever had any problems with your bowels because this may increase your risk of further bowel problems. Symptoms vary, but most patients will notice diarrhea, pass more gas, or have more frequent and urgent bowel movements. A few men have the opposite problem and have constipation. Some also experience pain in the rectum and feel that they have not emptied. Some patients will pass mucous or blood. If you are experiencing these problems, you need to tell your therapist as there are medications as well as dietary changes that can be made to reduce the symptoms.

The bladder and urethra are also within the field of radiation and will be injured as well. Radiation can irritate the lining of the bladder, causing a burning sensation with urination as well as an increased urgency to urinate. Symptoms may appear within a day or two of starting treatment but these usually start to improve once your course of radiation is finished. If you are having symptoms, tell your therapist so they can determine the cause of the symptoms. You should drink plenty of fluids and avoid irritants such as caffeine, sodas, and alcohol. Some patients find that cranberry juice or pills are helpful.

Some patients will notice problems with tiredness and loss of energy near the end of their treatment. Some preventive measures include light exercise. Rarely does tiredness cause any significant change in daily activity. Your energy should return within a few months of finishing treatment.

Other symptoms seen with External Radiation Therapy include changes in the hair around the rectum and pubic area and painful ejaculation.

Most of these symptoms are gone within 6 months of treatment, though a few men experience long term problems with radiation effects on the rectum or bladder. These patients will experience increased frequency and urgency.

The chief long term effects seen after radiation include loss of sexual function and loss of urinary control. The exact percentage of loss of sexual function is not known, but by 5 years approximately 50% of men are experiencing difficulty achieving an erection. Loss of urinary control is rare (2%) and is usually in men who have had operations on their prostate after radiation. Some patients report a reduction in the amount of their semen and infertility may be a result of radiation.

What does External Beam Radiation Therapy Involve?

Some patients prior to External Beam Radiation Therapy will be treated with hormone therapy to reduce the size of the prostate and increase the response to the treatment. This will start 2-3 months before the radiation treatments are begun.

The actual treatment is done in a radiation center. The initial visit to the center will be to plan the treatment in which you will be put into a simulator and small marks will be made to guide your treatment. The entire treatment is divided into daily treatments called “fractions”. Generally there are 35 treatments over 7 weeks (5 days a week). Each daily session will last for approximately 30 minutes.

What is my Follow Up after External Beam Radiation Therapy

You will be followed by both your Urologist and your Radiation Oncologist. Your PSA should start to decline after 3 months, but may not reach its lowest level until the 6th to 12th month. You will be monitored for symptoms as well as your PSA every 3 months for 2 years and then every 6 months.

What is IMRT?

IMRT (Intensity Modulated Radiation Therapy) is a form of external beam radiation therapy that is relatively new and an option in the treatment of prostate cancer. How does IMRT differ from standard External Beam Radiation Therapy?

IMRT differs from standard External Beam Radiation Therapy (also known as conformal beam therapy) in that the radiation is given in different intensities as the machine changes positions, allowing the therapist to limit the dose to the rectum and bladder, while maximizing the dose to the prostate. Though the early data is promising, it is not yet known whether IMRT is superior to conformal therapy.

What is involved in IMRT?

IMRT is given by an external beam machine and the actual procedure is no different from conformal therapy.

What is IGRT?

IGRT is Image Guided Radiation Therapy, which is a method of targeting th prostate by actual imaging of the prostate. This is done by placing 3 markers adjacent to the prostate by ultrasonography. These markers are used to line up the radiation machine each day of treatment instead of the usual skin marks. It is thought that this would provide more accurate aiming of the Xray beam, but there is no data to show that this has a better result at this time.

NOTES ON EXTERNAL BEAM THERAPY

IMRT

What is IMRT?

IMRT (Intensity Modulated Radiation Therapy) is a technique of varying the intensity of the radiation beam which allows more precise treatment of tumors. The procedure is done on a linear accelerator which is used for most external beam therapy. The IMRT equipped accelerators are modified to allow the computer input and beam controls.

How does IMRT differ from standard External Beam Radiation Therapy?

IMRT is planned by using 3-D computed tomography (CT) images of the patient in conjunction with computerized dose calculations to determine the dose intensity pattern that will best conform to the shape of the prostate. By using combinations of several intensity-modulated fields coming from different beam directions, a custom tailored radiation dose can be used that maximizes tumor dose while also protecting adjacent normal tissues. Because the ratio of normal tissue dose to tumor dose is reduced to a minimum with the IMRT approach, higher and more effective radiation doses can safely be delivered to tumors with fewer side effects compared with conventional radiotherapy techniques.

What is involved in IMRT?

There is no additional testing or preparation for the patient prior to starting the procedure. Since the technique is done on a standard linear accelerator, there are no additional precautions done during or after the procedure.

NOTES ON IMRT

Radioactive Seed Implant or Brachytherapy

What is a Radioactive Seed Implant?

A Radioactive Seed Implant is the placement of pellets of radiation in the prostate to treat prostate cancer. The technique is also called Brachytherapy.

Who is a Candidate for Radioactive Seed Implant?

Generally, patients who have cancer that is confined to the prostate are considered candidates for Radioactive Seed Implant. There are limitations on Radioactive Seed Implant which include the size the prostate, the extent of the cancer, and other treatments. Patients who have prostates that are over 60cc volume will generally need to have their prostates reduced, usually by hormonal treatments. Patients who have extensive cancer which has a likelihood of spread beyond the prostate will be better off having external beam radiation since the seed implants cannot adequately radiate the tissues surrounding the prostate. Patients who have had previous prostate surgery or who have had radiation to the prostate are not good candidates for radioactive seed implant.

How does Radioactive Seed Implant differ from External Beam Radiation Therapy?

A Radioactive Seed Implant differs from External Beam Radiation Therapy in that needles are place in the prostate to allow the radioactive pellets to be spaced throughout the prostate. There are 2 main distinctions between a seed implant and external beam therapy-number of treatments and area treated. With Radioactive Seed Implant, the procedure is done under anesthesia as an outpatient and only done 1 time. With External Beam Therapy, there are 35-40 treatments. Secondly, with Radioactive Seed Implant, only the prostate is treated with a much higher dose (approximately 15,000 cGy) of radiation than External Beam Therapy. External Beam Therapy can cover a wider area (the prostate and surrounding tissues) and the total dose to the prostate is less (6,700-7,000 cGy)

What are the methods of inserting the seeds?

The seeds are usually inserted into the prostate by placing needles into the prostate using an ultrasound in the rectum to guide the needles. Generally, the needles are spaced approximately 1cm (approximately 3/8") apart. The procedure is usually done under anesthesia.

What is the difference between the types of seeds?

There are a variety of radioactive elements that can be used to radiate the prostate. The most common are radioactive iodine (I-125) and radioactive palladium (Pd-103). There are distinct physical differences in these 2 types of elements, but there is no clinical data that shows 1 to be superior to the other in the outcomes of prostate cancer treatment.

What is the difference between a pre plan and intraoperative dosimetry plan?

There are 2 methods of determining the number of seeds and the placement of the seeds during the procedure. The older method is to measure the prostate and plan the placement before the operation. This is called "PrePlan". A newer technology is called "Intraoperative Planning" in which the prostate is measured at the time of the procedure and the placement of each pellet is monitored and recorded on a computer. This allows the adjustment of the plan to change the configuration of each additional pellet. The most

recent data shows that the intraoperative planning allows more precise placement of the pellets.

What are the benefits of a seed implant?

The benefits of a seed implant are that it avoids surgery and is more convenient than external beam therapy. The procedure is done as an outpatient and patients recover quickly. Many patients are able to go back to their daily routines within 48 hours of the procedure.

What are the side effects of a radioactive seed implant?

Short Term

In the first 2-3 days after radioactive seed implantation, you might note blood in your urine or in your stools. This is usually a minor problem and improves on its own. You can help by drinking liquids. You might also note discomfort with voiding, frequent voiding, urgent voiding, and a reduced urinary flow which may be due to the irritation of the prostate due to the radiation. These symptoms are generally mild and improve in the next 6-12 months. Some patients will also experience frequency and urgency of bowel movements, which is also generally mild and improves with time.

Long Term

In long term followup of patients who have radioactive seed implantation, the chief side effects are loss of urinary control (incontinence) and erectile dysfunction (Impotence). In the early post implantation time period, the likelihood of either of these complications is very low. In long term follow up of over 5 years, the likelihood of loss of urinary control is approximately 2%. If you have surgery in addition to the brachytherapy, the likelihood of urinary incontinence increases to over 40%. The likelihood of erectile dysfunction after radioactive seed implantation is approximately 50% by the time that patients have reached the 5th year after treatment.

Recurrence of the cancer is approximately the same as with surgery in patients undergoing radioactive seed implantation for the first 5 years, but is higher in patients undergoing seed implantation by the 7th year.

Can I have more radiation after the seed implant?

Brachytherapy is usually performed for definitive treatment and the maximum tolerable dose is used. This usually precludes any additional radiation.

Can I have surgery after a seed implant?

The effects of the radiation on the prostate, rectum, and bladder will inhibit the healing process. In addition, the complications of surgery after radiation are prohibitively high including loss of urinary control (incontinence). Surgery is rarely done in patients who have had radiation for prostate cancer for these 2 reasons.

What alternatives do I have if the cancer comes back?

Options for recurrent cancer after radiation therapy are either to watch the patient (observation) and intervene if the cancer spreads, treat with hormone therapy, or freeze the prostate (see Cryotherapy). Of these 3 options, only cryotherapy will actually kill the cancer.

Combined Radiation Therapy

What is combined Radiation Therapy?

Combined Radiation Therapy is using both External Beam (either conventional or IMRT) Radiation and Radioactive Seeds for the treatment of prostate cancer. The actual treatment is to give a partial treatment with seed implants and a partial treatment with external beam therapy. The seeds allow a high dose to be given internally to the prostate and the external beam therapy allows treatment of any cancer cells that may be in the tissue adjacent to the prostate. Theoretically, this allows the patient to receive the benefits of both treatments.

When is Combined Radiation Therapy used?

Generally, Combined Radiation Therapy is used in patients who are a relatively high risk for the cancer being into or beyond the capsule of the prostate. Patients who are in the high risk category include Gleason scores of greater than 7, patients who have PSA's above 10 ng/ml, patients who have a cancer that can be felt and is deemed to be locally extensive, and patients who have multiple positive biopsies with a high percentage of cancer in each biopsy.

What is the role of Hormonal Therapy in Combined Radiation Therapy?

Frequently, hormonal therapy is given in combination with the radiation therapy in order to improve the chances of survival. The usual hormonal treatment is to begin 2-3 months before the radiation and to continue the hormonal therapy for an additional 2 years after the radiation is given.

How is Combined Radiation Therapy given?

Usually the seed implant is done prior to the external beam treatments. The usual course is to implant the seeds at approximately 67% of the full dose and follow with external beam treatments starting 2 weeks after the seed implant, using approximately 20 treatments.

What are the side effects of Combined Radiation Therapy?

The side effects of Combined Radiation Therapy are not significantly different from either seed implant or external beam therapy alone. The reduction of the seed dose and the number of external treatments used in combined therapy reduces the side expected effects seen if full dosing were used.

Radical Prostatectomy

What is a Radical Prostatectomy?

A Radical Prostatectomy is the complete removal of the prostate gland and its attached structures. There are multiple approaches to removing the prostate, but all are aimed at complete removal of the prostate.

Who is a candidate for Radical Prostatectomy?

Any patient who has a reasonable life expectancy of greater than 10 years and who has cancer confined to the prostate is a candidate for Radical Prostatectomy. Generally, patients who are over age 75 are less likely to have surgery than younger patients. Patients who have significant risks for being put to sleep, such as severe lung or heart disease, are not good candidates for surgery.

Do I need to have my lymph nodes removed?

If your cancer is a low or intermediate risk cancer (Gleason score of 7 or less and PSA of less than 10) there is little chance that you have cancer in the lymph nodes and do not require a lymph node biopsy. If there are other reasons to suspect that the cancer is outside of the prostate such as an abnormal rectal examination or abnormal ultrasound.

What is a nerve sparing prostatectomy?

A Nerve Sparing prostatectomy is a modification of the operation to save the nerves and blood vessels that supply the penis and allow the patient to retain their sexual function. These nerves and blood vessels are close to the prostate and are saved only if they are easily separated from the prostate. A nerve sparing prostatectomy can be performed with equal success via the retropubic or perineal approach.

What are the types of Radical Prostatectomy?

There are 3 types of Radical Prostatectomy that are currently performed for prostate cancer. These are the abdominal approach (Retropubic Prostatectomy), the perineal approach (Perineal Prostatectomy), and the laparoscopic/robotic approach.

What is the Retropubic Prostatectomy?

The Retropubic Prostatectomy is the removal of the prostate through an incision in the abdomen. This approach allows the removal of the lymph nodes through the same incision.

What are the benefits of a Retropubic Prostatectomy?

The primary benefit of a Retropubic Prostatectomy is the ability to remove the lymph nodes at the same surgery. Another advantage is the ability to remove very large prostates.

What are the Risks of a Retropubic Prostatectomy

The risks of Retropubic Prostatectomy include bleeding, infection, rectal injury, and cardiovascular risks. Since the Retropubic Prostatectomy is done from the abdomen, the average blood loss is approximately 2 units. The risks of infection and rectal injury are about 1% each. The risk of a cardiovascular problem, such as a heart attack or stroke, depends upon what your current heart status is, but is up to 2%. The average hospital

stay is 2-3 days and the abdominal incision will slow your ability to walk or eat for a few days.

What is a Perineal Prostatectomy?

A Perineal Prostatectomy is the removal of the prostate by an incision between the rectum and the scrotum.

What are the benefits of a Perineal Prostatectomy?

The benefits of a Perineal Prostatectomy are a shorter hospital stay, less blood loss, and less pain than a Retropubic Prostatectomy. In addition, it is the best approach to obese patients and patients who have had previous abdominal or mesh hernia surgery.

What are the Risks of a Perineal Prostatectomy?

The risks of Perineal Prostatectomy include bleeding, infection, rectal injury, and cardiovascular risks. Since the Perineal Prostatectomy does not involve the pubic veins seen in the abcominal approach, the average blood loss is less than unit. The risks of infection and rectal injury are about 1% each. The risk of a cardiovascular problem such as a heart attack or stroke depends upon what your current heart status is, but is up to 2%. The average hospital stay is 1 days and you will be walking and eating within 12 hours.

What is a Laparoscopic Prostatectomy?

A Laparoscopic Prostatectomy is the removal of the prostate by using a laparoscope which is a telescope that is placed in the abdomen by a small incision near the navel. The surgeon will also place several other instruments through small incisions in other parts of the abdomen. The surgeon manipulates the instruments while watching through a camera which is attached to the laparoscope.

What are the benefits of a Laparoscopic Prostatectomy?

The benefits of laparoscopic surgery are a smaller incision, reduced pain compared to an abdominal (retropubic) incision, and a shorter hospital stay.

What are the risks of a Laparoscopic Prostatectomy?

The risks of Laparoscopic Prostatectomy include bleeding, infection, rectal injury, and cardiovascular risks. Though the Retropubic Prostatectomy is also done from the abdomen, the average blood loss is less than 1 unit since the vessels behind the pubic bone can be seen with magnification. The risks of infection and rectal injury are about 1% each. The risk of a cardiovascular problem such as a heart attack or stroke depends upon what your current heart status is, but is up to 2%. The average hospital stay is 1 day and you will be walking and eating within the first 12-24 hours. Other risks of the laparoscopic approach is the irritation of the lining of the abdominal wall from the carbon dioxide gas that is use to inflate the abdomen during the surgery which can cause a generalized abdominal pain and increased time in the operating room due to the technical difficulty of the operation.

What is a "Robotic" Prostatectomy?

A "Robotic" Prostatectomy is a laparoscopic prostatectomy that the surgeon uses a robotic arm to assist. Laparoscopic surgery is limited by the ability to sew and tie knots, which the robotic arm can overcome. The surgeon sits at a console which is connected to 2 robotic arms and a camera. The robotic arms move with the hands of the

surgeon and allow the surgeon to sew the bladder to the urethra. The camera is attached to a laparoscope, but is a 3 dimensional camera which enhances the ability to sew.

What are the benefits of a "Robotic" Prostatectomy?

The benefits of a "Robotic" prostatectomy are that it has less pain and blood loss as compared to the retropubic approach. These differences are no different from the laparoscopic or perineal approach. The advantage over the laparoscopic approach is that it allows the surgeon to suture and tie knots better.

What are the risks of a "Robotic" Prostatectomy?

The risks of "Robotic" Prostatectomy include bleeding, infection, rectal injury, and cardiovascular risks. Like the laparoscopic prostatectomy, the average blood loss is less than 1 unit since the vessels behind the pubic bone can be seen with magnification. The risks of infection and rectal injury are about 1% each. The risk of a cardiovascular problem such as a heart attack or stroke depends upon what your current heart status is, but is up to 2%. The average hospital stay is 1 day and you will be walking and eating within the first 12-24 hours. Other risks of the robotic approach is the irritation of the lining of the abdominal wall from the carbon dioxide gas that is use to inflate the abdomen during the surgery which can cause a generalized abdominal pain and increased time in the operating room due to the technical difficulty of the operation.

How do I decide what type of surgery is best for me?

The results of your surgery are directly related to the skills of the surgeon. There are no inherent differences between the results of retropubic, perineal, or laparoscopic prostatectomy if each is performed by a surgeon with a lot of experience. "Robotic" prostatectomy has been equally successful at removing the prostate, but there is very little information on the long term results such as sexual function, urinary control, or cancer recurrence.

There are some circumstances that require a specific approach. For example, a very large prostate is probably better done through the abdomen. Patients with prior abdominal surgery, mesh hernia repairs, or with a large abdomen are best done by the perineal approach.

What can I expect for post operative recovery?

Your expected hospital stay with either perineal prostatectomy or robotic prostatectomy will be about 1 day. Retropubic prostatectomies will generally stay in the hospital 2-3 days. You should be walking and eating a regular diet within the first 24 hours. You will notice that your energy levels are reduced for up to 6 weeks after surgery. The catheter is usually removed at 10-12 days.

Is there any way I can speed up my recovery?

There is little that can be done during the first few weeks to improve recovery after surgery. There are, however, several things that may improve and speed up the recovery of long term problems such as incontinence and erectile dysfunction.

The use of Kegel Exercises may

Cryoablation of the Prostate

What is Cryoablation of the Prostate?

Cryoablation of the Prostate is a technique where the prostate is frozen in order to destroy the prostate cancer. Probes are inserted into the prostate that freeze the prostate to -40 degrees C. As opposed to most active treatments of the prostate, cyroablation can be performed multiple times on the same prostate**.**

How is Cryoablation of the Prostate performed?

The technique of cryoablation of the prostate is usually performed with the patient asleep. An ultrasound probe is inserted into the rectum and used to place 5-8 needles into the prostate. Thermocouples are inserted into the areas such as the sphincter (control rectum) and the space between the rectum and the prostate to help monitor the freezing process.

Who is a candidate for Cryoablation of the Prostate?

Any patient who has localized prostate cancer is a potential candidate for cryoablation of the prostate. Cryoablation can be done in patients who have had previous radiation therapy as well as in patients who have never been treated for cancer.

What are the advantages of Cryoablation of the Prostate?

The advantages of Cryoablation of the Prostate are that it can be performed in patients who have had radiation therapy. In addition, Cryoablation can be repeated if necessary. The procedure is minimally invasive with a very low chance of blood loss, a short recovery time, and is done as an outpatient.

What are the risks of Cryoablation of the Prostate?

The risks of Cryoablation include impotence and incontinence. In patients who have had prior radiation, the risks of incontinence and impotence are significantly higher. There is also a risk of developing a fistula (a hole) between the rectum and the urinary tract. Finally, there is relatively little data on the long term results of Cryoablation compared to radiation therapy or radical prostatectomy.

Other Treatments for Prostate Cancer

Chemotherapy

- **When is Chemotherapy given for prostate cancer?**
  Chemotherapy is not commonly used for prostate cancer except in patients who have stopped responding to hormonal therapy. Generally, these patients have advanced cancer and it remains controversial as to where and when is the best use of chemotherapy in prostate cancer.

- **What side effects can I expect from Chemotherapy?**
  Different chemotherapy drugs can have different side effects, most commonly nausea and vomiting, loss of appetite, mouth sores, feeling tired, hair loss, and laboratory changes including a low white blood cell count.

- **What are the results of Chemotherapy for prostate cancer/**

Herbal Treatments

- **Are there any natural treatments for prostate cancer?**
- **What are the risks of taking a natural treatment**

Dietary

- **What dietary supplements are available for prostate cancer?**

HIFU

- **What is HIFU**

How is the procedure done?

- **How is the procedure done**
- **Who is a candidate for HIFU**
- **What are the results of HIFU**
- **Is HIFU Available in the United States?**

GLOSSARY

Adenocarcinoma
Advanced Prostate Cancer
Androgens
Anti-androgen therapy
Antioxidant
Biopsy
Bone scan
BPH
Brachytherapy
Catheter
Chemotherapy
Conformal radiation therapy
CT Scan
Cystitis
Digital Rectal Examination
DRE
Erectile Dysfunction
External Beam Radiation
Flare
Fraction
Frequency
Gleason Score
Hesitancy
Hormone
Hormone refractory
Hormone Therapy
Hot Flashes
Impotence
IMRT
Incontinence
Laparoscopy
LHRH Agonist
Libido
Localized Prostate Cancer
Lycopene
Lymph Nodes
Malignant
Metastatic Cancer
MRI
Nocturia
Osteoporosis
Perineum
ProstaScint™ Scan
Prostatitis
PSA
Radical Prostatectomy

Radiation Therapy
Risk Factor
Rectum
Screening
Seminal Vesicles
Testosterone
TURP
Urethra
Urgency
Watchful Waiting

APPENDIX 1

Stages of Prostate Cancer

Staging systems for prostate cancer include the extent of the tumor in the prostate (T), the involvement of the lymph nodes (N), and whether the cancer has spread (M)

T

T1: The cancer can not be felt on examination or seen by ultrasound.

T1a: The cancer is found during a transurethral resection (TURP) that was done for benign prostatic hyperplasia (BPH). Cancer is in less than 5% of the tissue removed.

T1b: The cancer is found during a TURP but is present in more than 5% of the tissue removed.

T1c: The cancer is found by needle biopsy that was done because of an increased PSA.

T2: The cancer can be felt on examination, but appears to be confined to the prostate.

T2a: The cancer is in one half or less of only one side.

T2b: The cancer is in more than half of only one side.

T2c: The cancer is in both sides of the prostate.

T3: The cancer can be felt on examination and appears to have gone beyond the prostate.

T3a: The cancer extends outside the prostate but not to the seminal vesicles.

T3b: The cancer has spread to the seminal vesicles.

T4: The cancer has spread to tissues next to the prostate such as the bladder, the rectum, and/or the pelvis.

N

N0: The cancer has not spread to any lymph nodes.

N1: The cancer has spread to one or more regional (nearby) lymph nodes in the pelvis.

M

M0: The cancer has not spread beyond the regional lymph nodes.

M1: The cancer has spread beyond the regional nodes.

M1a: The cancer has spread to distant (outside of the pelvis) lymph nodes.

M1b: The cancer has spread to the bones.

M1c: The cancer has spread to other organs such as lungs, liver, or brain

APPENDIX

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