What is Prostate Cancer?

Prostate cancer is a malignant tumor that begins in the prostate gland of men. Over 95% of prostate cancers are **adenocarcinomas**, cancers that develop in glandular tissue. Another important type of prostate cancer is known as neuro-endocrine or **small cell anaplastic cancer.** This type tends to spread (metastasize) earlier, but does not produce prostate specific antigen (PSA), a tumor marker discussed below.

The prostate is a walnut-sized gland located behind the base of the penis, in front of the rectum and below the bladder. It surrounds the urethra, the tube-like channel that carries urine and semen through the penis. The prostate's main function is to produce seminal fluid, the liquid in semen that protects, supports and helps transport sperm.

Some prostate cancers grow very slowly and might not cause problems for years. Many men with slow-growing prostate cancer may co-exist with their disease and die of something else. But if cancer does spread quickly to other parts of the body, treatment can help manage cancer and control pain, fatigue, and other symptoms.

As we well know, there are many kinds of cancer; unfortunately they all come about because of the out-of-control growth of abnormal cells.

Why is prostate cancer important?

In 2003, 235,000 new cases of prostate cancer were diagnosed in the United States. What's more, 41,000 deaths related to prostate cancer are expected in the year 2004. Thus, prostate cancer is the most common malignancy in American men and the second leading cause of deaths from cancer, after lung cancer. Most experts in this field, therefore, recommend that beginning at age 40, all men should undergo yearly screening for prostate cancer.

What causes prostate cancer?

The cause of prostate cancer is unknown, but the cancer is thought not to be related to benign prostatic hypertrophy (BPH). The risk (predisposing) factors for prostate cancer include advancing age, genetics (heredity), hormonal influences, and such environmental factors as toxins, chemicals, and industrial products. The chances of developing prostate cancer increase with age. Thus, prostate cancer under age 40 is extremely rare, while it is common in men older than 80 years of age. As a matter of fact, some studies have suggested that among men over 80, between 50 and 80 percent of them may have prostate cancer!

Genetics (heredity), as just mentioned, plays a role in the risk of developing a prostate cancer. For example, black American men have a higher risk of getting prostate cancer than do Japanese or white American men. Environment, diet, and other unknown factors, however, can modify such genetic predispositions. For example, prostate cancer is uncommon in Japanese men living in their native Japan. However, when these men move to the United States, their incidence of prostate cancer rises significantly. Prostate cancer is also more common among family members of individuals with prostate cancer. Thus, a person whose father, grandfather, or even uncle has prostate cancer is at an increased risk for also developing prostate cancer. To date, however, no specific prostate cancer gene has been identified and verified. (Genes, which are situated on chromosomes within the nucleus of cells, are the chemical compounds that determine specific traits in individuals.)

Testosterone, the male hormone, directly stimulates the growth of both normal prostate tissue and prostate cancer cells. Not surprisingly, therefore, this hormone is thought to be involved in the development and growth of prostate cancer. The important implication of the role of this hormone is that decreasing the level of testosterone should be (and usually is) effective in inhibiting the growth of prostate cancer.

Environmental factors, such as cigarette smoking and diets that are high in saturated fat, seem to increase the risk of prostate cancer. Additional substances or toxins in the environment or from industrial sources might also promote the development of prostate cancer, but these have not yet been clearly identified.

What are the symptoms of prostate cancer?

In the early stages, prostate cancer often causes no symptoms for many years. As a matter of fact, these cancers frequently are first detected by an abnormality on a blood test (the PSA, discussed below) or as a hard nodule (lump) in the prostate gland. Usually, the doctor first feels the nodule during a routine digital (done with the finger) rectal examination. (Note in the diagram that the prostate gland is right in front of the rectum.)

As the cancer enlarges and presses on the urethra, the flow of urine diminishes and urination becomes more difficult. Patients may also experience burning with urination or blood in the urine. As the tumor continues to grow, it can completely block the flow of urine, resulting in a painfully obstructed and enlarged urinary bladder.
In the later stages, prostate cancer can spread locally into the surrounding tissue or the nearby lymph nodes, called the pelvic nodes. The cancer then can spread even farther (metastasize) to other areas of the body. The doctor on a rectal examination can sometimes detect local spread into the surrounding tissues. That is, the physician can feel a hard, fixed (not moveable) tumor extending from and beyond the gland. Prostate cancer usually metastasizes first to the lower spine or the pelvic bones (the bones connecting the lower spine to the hips), thereby causing back or pelvic pain. The cancer can then spread to the liver and lungs. Metastases (areas to which the cancer has spread) to the liver can cause pain in the abdomen and jaundice (yellow color of the skin) in rare instances. Metastases to the lungs can cause chest pain and coughing.

Healthy Cells vs. Cancer Cells

Healthy cells are like a cat. They need structure to determine the size of bones and shape of the body, tail and whiskers. The DNA in genes and chromosomes determine this. They need energy to play and prowl and sustain life. This is derived from chemicals in food. Cats need a system to deliver chemicals (food nutrients like amino acids, carbohydrates, fats, vitamins and minerals) to all parts of their body. These are the blood vessels. Growth factors take a kitten into a lazy old cat, all the while helping it to function normally.

The body and its cells are mostly made up of protein. The building blocks of proteins are substances called amino acids that in the form of enzymes and hormones literally control every chemical reaction within the cells. When these are modified, different messages are sent to a complex control system that can alter their function. There are twenty different kinds of amino acids that are essential to life. Twelve of these can be synthesized within the body however; eight must be supplied by the daily diet.

Structure	
Normal Cells	**Cancer Cells**
DNA in genes and chromosomes go about their business in a normal way.	Cancer cells develop a different DNA or gene structure or acquire abnormal numbers of chromosomes.
Cells divide in an orderly way to produce more cells only when the body needs them.	Cells continue to be created without control or order. If not needed, a mass of tissue is formed which is called a tumor.
Energy	
Normal Cells	**Cancer Cells**
Cells derive 70% of their energy from a system called the “Krebs Cycle.”	Cells have a defective “Krebs Cycle” and derive little or no energy from it.
Cells derive only 20% of their energy from a system called “Glycolosis.”	Cancer cells derive almost all their energy from “Glycolosis.”
Cells derive most of their energy with the use of oxygen.	Cells derive most of their energy in the absence of oxygen.
Blood Vessels	
Normal Cells	**Cancer Cells**
Cells have a built-in blood vessel system.	Cells do not have a built-in blood vessel system. They require more of certain amino acids to grow.

Growth Factors	
Normal Cells	**Cancer Cells**
While similar to cancer cells, the amount of them is more in balance to produce a more normal level of activity.	These cells have over produced, require more chemicals (food) and are over active.
Functions	
Normal Cells	**Cancer Cells**
The enzymes and hormones go about business in a normal balanced manner.	The enzymes and hormones are either over active or under active.
Tumors are Different	
Benign	**Malignant**
Benign tumors are not cancerous. They do not invade nearby tissues nor spread to other parts of the body. They can be removed and are not a threat to life.	Malignant tumors are cancerous. They can invade and damage nearby tissues and organs and they can break away and enter the blood stream to form new tumors in other parts of the body. The spread of cancer is called metastasis.

What are the screening tests for prostate cancer?

Screening tests are those that are done at regular intervals to detect a disease such as prostate cancer at an early stage. If the result of a screening test is normal, the disease is presumed not to be present. If a screening test is abnormal, the disease is then suspected to be present, and further tests usually are needed to confirm the suspicion (that is, to make the diagnosis definitively). Prostate cancer usually is suspected initially because of an abnormality of one or both of the two screening tests that are used to detect prostate cancer. These screening tests are a digital rectal examination and a blood test called the prostate specific antigen (PSA).

In the digital rectal examination, the doctor feels (palpates) the prostate gland with his index finger in the rectum to detect abnormalities of the gland. Thus, a lump, irregularity, or hardness felt on the surface of the gland is a finding that is suspicious for prostate cancer. Accordingly, doctors usually recommend doing a digital rectal examination annually in men age 40 and over.

The PSA test is a simple, reproducible, and accurate blood test. It is used to detect a protein (the prostate specific antigen) that is released from the prostate gland into the blood. Most importantly, the level of the PSA is usually higher in people with prostate cancer than in people without the cancer. The PSA, therefore, is valuable as a screening test for prostate cancer. Accordingly, doctors usually recommend doing a PSA annually in men age 50 and over. Furthermore, for men who have high risks for prostate cancer as discussed above, most doctors recommend starting the PSA screening at an even younger age (for example, at age 40).

Results of the PSA test under 4 nanograms per milliliter of blood are generally considered normal. (See the next two sections on false-positive elevations of the PSA and on refinements in the PSA test.) Results between 4 and 10 are considered borderline. These borderline values are interpreted in the context of the patient's age, symptoms, signs, family history, and changes in the PSA levels over time. Results higher than 10 are considered abnormal, suggesting the possibility of prostate

cancer.The higher the PSA value, the more likely the diagnosis of prostate cancer. Moreover, the level of PSA tends to increase when the cancer has progressed from organ-confined prostate cancer to local spread to distant (metastatic) spread. Very high values, such as 30 or 40 and over, are usually caused by prostate cancer.

What are false-positive elevations in the PSA test?

False-positive elevations in the PSA are increases in the PSA that are caused by conditions other than prostate cancer. For example, benign prostate hypertrophy (BPH) and infection or inflammation of the prostate (prostatis) from whatever cause can elevate the PSA. Note also that a rectal examination or an ejaculation within the prior 48 hours can sometimes elevate the PSA. False-positive elevations are usually in the 4 to10 range, but they can go as high as 25 or 30. At these higher levels, however, caution in the interpretation of the test is warranted because a prostate cancer may well be present. Non-prostatic diseases or infections, medications, foods, smoking, and alcohol do not cause false-positive elevations of the PSA.

The ability of the PSA test to detect prostate cancer (called the sensitivity of the test) is high. The reason for this is that most patients, although not all, with prostate cancer have a borderline or an abnormally elevated PSA. The ability of the test to exclude other diagnoses (called the specificity of the test), however, is lower because of the other conditions that can cause false-positive elevations of the PSA.

What refinements have been made in the PSA test?

Recently, several refinements have been made in the PSA blood test. The purpose of these refinements is to help doctors to better assess a borderline or an elevated PSA. The goal is to determine more accurately who has prostate cancer and who has a false-positive elevation of the PSA from another condition. In other words, the purpose of the improvements is to improve the sensitivity and the specificity of the test.

One refinement is called the PSA ratio. This ratio is determined by dividing the amount of PSA that circulates freely in the blood stream by the amount of PSA that is bound to proteins in the blood stream. Research has shown the PSA that circulates freely in the blood tends to be associated with benign prostatic hypertrophy (BPH) whereas the PSA that is bound to protein tends to be linked with prostate cancer. Thus, a high PSA ratio suggests a false-positive elevation of the PSA and weighs against the diagnosis of prostate cancer. In contrast, a high PSA with a low PSA ratio favors the diagnosis of prostate cancer.

Another recent modification of the PSA test is based on the observation that as men age, the amount of PSA in the blood can normally rise without the presence of a prostate cancer. Thus, doctors can use what is referred to as an age-specific

PSA, especially to evaluate borderline values. In the age-specific PSA, the normal values are adjusted for the age of the patient. Accordingly, the age-specific normal ranges are 0 to 2.5 for men in their 40s, 0 to 3.5 in their 50s, 0 to 4.5 in their 60s, and 0 to 6.5 for men 70 and over. Therefore, as an example, a PSA of 4 would be considered borderline for men in their 30s and 40s, but could be normal for men in their 50s, 60s,

and 70s.

Yet another improvement of the PSA test is called the PSA velocity or slope. The velocity is calculated as the rate at which the PSA changes with repeated testing over time. The more rapid the rise in the PSA, the more likely is the presence of a prostate cancer. The less rapid the rise in the PSA, the less likelihood there is that a prostate cancer is present.

How is prostate cancer diagnosed?

Prostate cancer is diagnosed from the results of a biopsy of the prostate gland. If the digital rectal exam of the prostate or the PSA blood test is abnormal, a prostate cancer is suspected. A biopsy of the prostate is usually then recommended. The biopsy is done from the rectum (trans-rectally) and is guided by ultrasound images of the area. A small piece of prostate tissue is withdrawn through a cutting needle. A pathologist then examines the tissue under a microscope for signs of cancer in the cells of the tissue.

When prostate cancer is diagnosed on the biopsy tissue, the pathologist will then grade each of two pieces of the tissue from 1 to 5 on the Gleason scale. The scale is based on certain microscopic characteristics of the cancerous cells and reflects the aggressiveness of the tumor. The two scores are then added together. Sums of 2 to 4 are considered low, indicating a slowly growing tumor. Sums of 5 and 6 are intermediate, representing an intermediate degree of aggressiveness. Sums of 7 to 10 are considered high, signaling a rapidly growing tumor with the worst prognosis (outcome).

Gleason scores can be helpful in guiding treatment that is based, at least in part, on the aggressiveness of the tumor. The principal application of the Gleason score, however, is in predicting the risk for death from a prostate cancer. Thus, recent studies have shown that men with Gleason scores of 2 to 4 face a minimal risk (4 to 7%) of death from prostate cancer over the ensuing 15 years, while men with scores of 8 to 10 face a high risk (60 to 87%) of death from prostate cancer over the 15 year period.

How is the staging of prostate cancer done?

The staging of a cancer refers to determining the extent of the disease. Once a prostate cancer is diagnosed on a biopsy, additional tests are done to assess whether the cancer has spread beyond the gland. For this assessment, biopsies of the surrounding organs, such as the rectum or urinary bladder, or of the nearby (pelvic) lymph nodes might be done. In addition, imaging tests are usually performed. For example, radionuclide bone scans can determine if there is a spread of the tumor to the bones. Additionally, CAT scans (coaxial tomography) and MRIs (magnetic reonance imaging) can determine if the cancer has spread to adjacent tissues or organs such as the bladder or rectum or to other parts of the body such as the liver or lungs.

In brief, doctors do the staging of prostate cancer based primarily on the results of the prostate biopsy, possibly other biopsies, and imaging tests. In staging a cancer, doctors assign various letters and numbers to the cancer, depending on which of the classifications for staging they use. The numbers and letters in the different classifications define the volume or amount of the tumor and the spread of the cancer.

The stage of the prostate cancer, therefore, helps to predict the expected course of the disease and determine the choice of treatment.

Two main systems are used to stage prostate cancer. In the American urologic staging system, stage A describes a minimal cancer that can neither be palpated (felt) on physical examination nor seen by imaging techniques. Such a tumor is so small that it can be detected only by viewing it under a microscope. Stage B refers to a larger cancer that may be palpated, but that still is confined (localized) to the prostate gland. Stage C indicates local spread beyond the prostate into the surrounding tissues. Stage D1 signifies a spread to the nearby (pelvic) lymph nodes and D2 is for distant spread (metastasis), for example, to the bones, liver, or lungs.

The other main system for staging prostate cancer is called the tumor, nodes, and metastasis (TNM) classification. In this system, T1 and T2 are equivalent to stage A and B (respectively) in the American urologic system. T3 describes cancer that extends just beyond the capsule (coat) of the prostate, and T4 describes cancer that is fixed to the surrounding tissues. N1 is equivalent to Stage D1 and M1 is equivalent to D2.

What are the treatment options for prostate cancer?

Deciding on treatment can be daunting, partly because the options for treatment today are far better than they were ten years ago, but also because not enough reliable data are available on which to base the decisions. Accordingly, scientifically controlled, long term studies are still needed to compare the benefits and risks of the various treatments.

To decide on treatment for an individual patient, doctors categorize prostate cancers as organ-confined (localized to the gland), locally advanced (a large prostate tumor or one that has spread only locally), or metastatic (spread distantly or widely). The treatment options for organ-confined prostate cancer or locally advanced prostate cancer usually include surgery, radiation therapy, hormonal therapy, cryotherapy, combinations of some of these treatments, and watchful waiting. A cure for metastatic prostate cancer is, unfortunately, unattainable at the present time. The treatments for metastatic prostate cancer, which include hormonal therapy and chemotherapy, therefore, are considered palliative. By definition, the aims of palliative treatments are, at best, to slow the growth of the tumor and relieve the symptoms of the patient.

Other factors considered in choosing treatment include the age, general health, and preference of the individual and the Gleason score and stage of the cancer. The results of the PSA test sometimes also can help to decide on the treatment. For example, a borderline elevation of the PSA (4-10), if shown to be due to a prostate cancer, suggests that the cancer is confined to the gland. If other tests also point to an organ-confined tumor, surgery or possibly radiation can be considered to attempt a cure. In contrast, a very high PSA (for example, over 30 or 40) raises the possibility of metastases. If the metastases are then confirmed by other tests, the treatment options would be limited to hormonal therapy or chemotherapy.

PSA tests also should be done periodically after treatment to help assess the results of treatment. For example, an increasing PSA suggests growth or spread of the cancer, despite the treatment. In contrast, a decreasing PSA indicates improvement. As a matter

of fact, a post-treatment PSA of zero may indicate complete control or cure of the cancer.

What about surgical treatment for prostate cancer?

The surgical treatment for prostate cancer is commonly referred to as a radical or total prostatectomy, which is the removal of the entire prostate gland. Since 1990, the radical prostatectomy has been the most common treatment for prostate cancer in the United States. This operation is done in about 36% of patients with organ-confined (localized) prostate cancer. The American Cancer Society estimates a 90% cure rate nationwide when the disease is confined to the prostate and the entire gland is removed. The potential complications of a radical prostatectomy include the risks of anesthesia, local bleeding, impotence (loss of sexual function) in 30%-70% of patients, and incontinence (loss of control of urination) in 3%-10% of patients.

Great strides have been made in lowering the frequency of the complications of radical prostatectomy. These advances have been accomplished largely through improved anesthesia and surgical techniques. The improved surgical techniques, in turn, stem from a better understanding of the key anatomy and physiology of sexual potency and urinary continence. Specifically, the recent introduction of nerve-sparing techniques for the prostatectomy has helped to reduce the frequency of impotence and incontinence.

If post-treatment impotence does occur, it can be treated by sildenafil (Viagra) tablets, injections of such medications as alprostadil (Caverject) into the penis, various devices to pump up or stiffen the penis, or a penile prosthesis (an artificial penis). Incontinence after treatment often improves with time, special exercises, and medications to improve the control of urination. Occasionally, however, incontinence requires implanting an artificial sphincter around the urethra. The artificial sphincter is made up of muscle or other material and is designed to control the flow of urine through the urethra.

What about radiation therapy for prostate cancer?

The goal of radiation therapy is to damage the cancer cells and stop their growth or kill them. This works because the rapidly dividing (reproducing) cancer cells are more vulnerable to destruction by the radiation than are the neighboring normal cells. Clinical trials have been conducted using radiation therapy for patients with organ-confined (localized) prostate cancer. These trials have shown that radiation therapy resulted in a rate of survival (being alive) at 10 years after treatment that is comparable to that for radical prostatectomy. Incontinence and impotence can occur as complications of radiation therapy, as with surgery, although perhaps less often than with surgery. More data are needed, however, on the risks and benefits of radiation therapy beyond 10 years, especially because late recurrences (reappearances) of the cancer can sometimes occur after radiation.

Choosing between radiation and surgery to treat organ-confined prostate cancer involves considerations of the patient's preference, age, and co-existing medical conditions (fitness for surgery), as well as of the extent of the cancer. Approximately 30% of patients with organ-confined prostate cancer are treated with radiation.

Sometimes, oncologists combine radiation therapy with surgery or hormonal therapy in efforts to improve the long-term results of treatment in the early or later stages of prostate cancer.

Radiation therapy can be given either as external beam radiation over perhap s 6 or 7 weeks or as an implant of radioactive seeds (brachytherapy) directly into the prostate. In external beam radiation, high energy x-rays are aimed at the tumor and the area immediately surrounding it. In brachytherapy, radioactive seeds are inserted through needles into the prostate gland under the guidance of transrectally taken ultrasound pictures. Brachy, from the Greek language, means short. The term brachytherapy thus refers to placing the treatment (radiation therapy) directly into or a short distance away from the cancerous target tissue. The theoretical advantage of brachytherapy over external beam radiation is that delivering the radiation energy directly into the prostate tissue should minimize damage to the surrounding tissues and organs. The actual advantages or disadvantages of brachytherapy as compared to external beam radiation, however, are still being studied.

What about hormonal treatment for prostate cancer?

The male (androgenic) hormone is called testosterone. It stimulates the growth of cancerous prostatic cells and, therefore, is the primary fuel for the growth of prostate cancer. The idea of all of the hormonal treatments (medical and surgical), in short, is to decrease the stimulation by testosterone of the cancerous prostatic cells. Testosterone normally is produced by the testes in response to stimulation from a hormonal signal called LH-RH. The LH-RH stands for luteinizing hormone-releasing hormone and is also called gonadotropin-releasing hormone. This hormone comes from a control station in the brain and travels in the blood stream to the testes. Once there, the LH-RH stimulates the testes to produce and release testosterone.

Hormonal treatment, also referred to as androgenic deprivation (depriving the prostate of testosterone), can be accomplished surgically or medically. The surgical hormonal treatment is removal of the testes in an operation called an orchiectomy or a castration. This surgery thus removes the body's source of testosterone. The medical hormonal treatment involves taking one or two types of medication. One type is referred to as the LH-RH agonists. They work by competing with the body's own LH-RH. These drugs thereby inhibit (block) the release of LH-RH from the brain. The other type of drug is referred to as anti-androgenic, meaning that these drugs work against the male hormone. That is, they work by blocking the effect of testosterone itself on the prostate.

Today, most men electing hormonal treatment choose medication over surgery, probably because they view surgical castration as more devastating cosmetically or psychologically. Actually, however, the effectiveness and side effects of medical hormonal treatment as compared to surgical hormonal treatment are very much the same. Both types of hormonal treatment usually effectively eliminate stimulation of the cancer cells by testosterone. Some tumors of the prostate, however, do not respond to this form of treatment. They are referred to as androgen-independent prostate cancers. The principal side effects of all of these hormonal treatments (that is, the side effects of androgenic deprivation) are enlarged breasts (gynecomastia) that often are tender, flushing (like hot flashes), and impotence.

The LH-RH agonists, leuprolide (Lupron) or goserelin (Zoladex), are given as monthly injections in the doctor's office. The anti-androgenic drugs, flutamide (Eulexin) or bicalutamide (Casodex), are oral capsules that are used usually in combination with the LH-RH agonists. The LH-RH agonists are often effective alone. The anti-androgenic drugs are added, however, if the cancer progresses despite the use of the LH-RH agonists. The hormonal treatments may have value, as well, when combined with radiation therapy. Studies are currently being conducted to determine if hormonal therapy enhances the therapeutic effect of radiation.

Generally, hormonal treatment is reserved for individuals who have advanced prostate cancer with local spread or metastases. Occasionally, an individual with organ-confined (localized) prostate cancer will receive hormonal treatment because he has severe associated medical problems or simply because he refuses to undergo surgery or radiation. Hormonal treatment is used in less than 10 percent of men with organ-confined (localized) prostate cancer. Remember that the intent of hormonal therapy usually is palliative. This means that the goal is to control the cancer rather than cure it because a cure is not possible.

What is cryotherapy for prostate cancer?

Cryotherapy is one of the newer treatments that is being evaluated for use in the early stage of prostate cancer. This treatment kills the cancer cells by freezing them. The freezing is accomplished by inserting a freezing liquid (for example, liquid nitrogen or argon) through needles directly into the prostate gland. The procedure is accomplished under the guidance of ultrasoundimages. Actually, cryotherapy is not a new technique. Rather, it is a modification of a procedure that was tried previously, but had an unacceptably high rate of complications. Thus, cryotherapy was used in the 1960s to freeze the lining of the stomach to treat ulcers, but was discontinued because it also severely damaged the lining of the stomach.

At present, cryotherapy is recommended for patients with locally advanced prostate cancer who, for whatever reason, are not candidates for the more established treatments. Cryotherapy is further being studied to determine which other patients might benefit from this treatment. For example, studies are underway to establish whether cryotherapy is beneficial as an initial treatment for organ-confined (localized) prostate cancer. The effectiveness of cryotherapy in eliminating prostate cancer, however, has not yet been proven. We do know that sometimes the freezing liquid fails to kill all of the cancer cells. Moreover, the potential side effects of this treatment include damage to the urethra and bladder. This damage can cause obstruction (blockage) of the urethra, fistulas (abnormal tunnels) that leak urine, or serious infections.

What is chemotherapy for prostate cancer?

Chemotherapeutic agents, or chemotherapy, are anti-cancer drugs. They are used as a palliative treatment (palliation) in patients with advanced cancer for whom a cure is unattainable. Recall that the goal of palliation is simply to slow the tumor's growth and relieve the patient's symptoms. Chemotherapy is not ordinarily used for organ-confined or locally advanced prostate cancers because a cure in these cases is possible with

other treatments. Currently, chemotherapy is used only for advanced metastatic prostate cancers that have failed to respond to other treatments.

Several chemotherapeutic agents have been used effectively to palliate metastatic prostate cancer. One such agent is estramustine (Emcyt). Another agent, mitoxantrone (Novantrone), has been shown to be effective in combination with prednisone for palliating androgen-independent prostate cancer. As mentioned previously, metastatic tumors that have not responded specifically to hormonal therapy are referred to as androgen-independent (hormone-refractory) prostate cancers.

The more common side effects of chemotherapy include weakness, nausea,hair loss, and suppression of the bone marrow. The suppression of marrow, in turn, can decrease the red blood cells (causing anemia), the white blood cells (leading to infections), and the platelets (resulting in bleeding).

New chemotherapeutic agents for prostate cancer are continually being studied for their effectiveness and safety in cancer centers throughout the United States and elsewhere. For example, cancer specialists (oncologists) have been evaluating paclitaxel (Taxol) or docetaxel (Taxotere) for metastatic prostate cancer. (These two drugs are effective in palliating metastatic breast cancer.) Another one of the newer chemotherapeutic agents under investigation for androgen independent prostate cancer is Suramin.

Can prostate cancer be prevented?

No specific measures are known to prevent the development of prostate cancer. At present, therefore, we can hope only to prevent progression of the cancer by making early diagnoses and then attempting to cure the disease. Early diagnoses can be made by screening men for prostate cancer. Screening is done, as mentioned previously, by routine yearly digital rectal examinations beginning at age 40 and the addition of an annual PSA test beginning at age 50. The purpose of the screening is to detect early, tiny, or even microscopic cancers that are confined to the prostate gland. Early treatment of these malignancies (cancers) can stop the growth, prevent the spread, and possibly cure the cancer.

Based on some research in animals and people, certain dietary measures have been suggested to prevent the progression of prostate cancer. For example, low fat diets, particularly avoiding red meats, have been suggested because they are thought to slow down the growth of prostate tumors in a manner not yet known. Soybean products, which work by decreasing the amount of testosterone circulating in the blood, also reportedly can inhibit the growth of prostate tumors. Finally, other studies show that tomato products (lycopenes), the mineral selenium, and vitamin E might slow the growth of prostate tumors in ways that are not yet understood.

Source: A.P. John Institute for Cancer Research

When considering any type of complementary cancer treatment or alternative cancer treatment, always consult with your physician first, as possible interactions could reduce your treatment protocol's efficacy.