



Prostate Cancer Overview

The information that follows is an overview of this type of cancer. It is based on the more detailed information in our document, *Prostate Cancer*. This document and other information can be obtained by calling 1-800-227-2345 or visiting our Web site at www.cancer.org.

What is cancer?

The body is made up of hundreds of millions of living cells. Normal body cells grow, divide, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out, damaged, or dying cells.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of this out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells keep on growing and form new cancer cells. These cancer cells can grow into (invade) other tissues, something that normal cells cannot do. Being able to grow out of control and invade other tissues are what makes a cell a cancer cell.

In most cases the cancer cells form a tumor. But some cancers, like leukemia, rarely form tumors. Instead, these cancer cells are in the blood and bone marrow.

When cancer cells get into the bloodstream or lymph vessels, they can travel to other parts of the body. There they begin to grow and form new tumors that replace normal tissue. This process is called *metastasis* (muh-**tas**-tuh-sis).

No matter where a cancer may spread, it is always named for the place where it started. For instance, breast cancer that has spread to the liver is still called breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bone is called metastatic prostate cancer, not bone cancer.

Different types of cancer can behave very differently. For example, lung cancer and breast cancer are very different diseases. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their own kind of cancer.

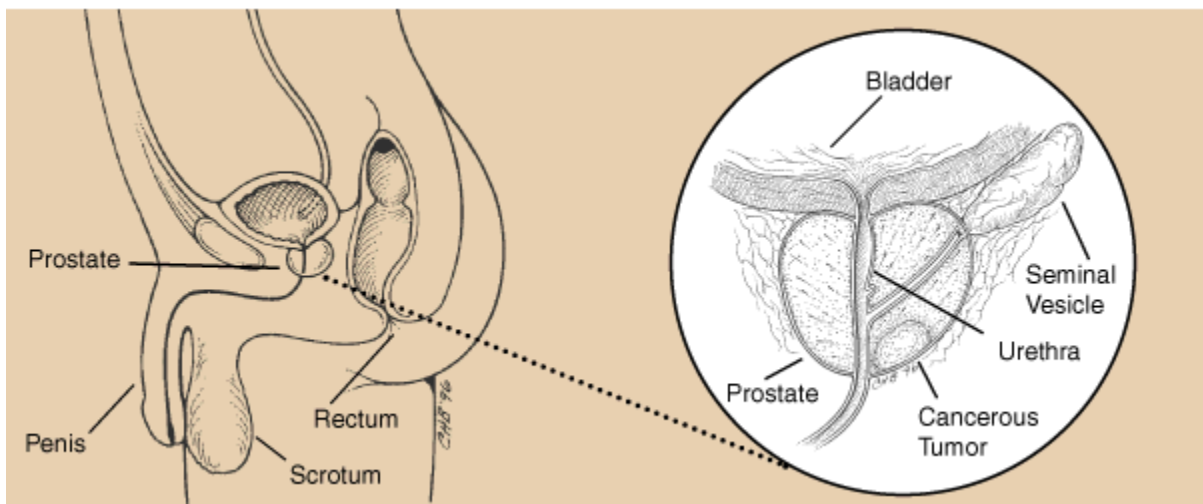
Not all tumors are cancerous. Tumors that aren't cancer are called *benign* (be-**nine**). Benign tumors can cause problems-- they can grow very large and press on healthy organs and tissues. But they cannot grow into other tissues. Because of this, they also can't spread to other parts of the body (metastasize). These tumors are almost never life threatening.

What is prostate cancer?

The prostate

The prostate is a gland found only in men. As shown in the picture below, the prostate is just below the bladder and in front of the rectum. The size of the prostate varies with age. In younger men, it is the size of a walnut, but it can be much larger in older men. The tube that carries urine (the urethra) runs through the center of the prostate. The prostate contains cells that make some of the fluid (semen) that protects and nourishes the sperm.

The prostate begins to develop before birth and keeps on growing until a man reaches adulthood. Male hormones (called androgens) cause this growth. If male hormone levels are low, the prostate gland will not grow to full size. In older men, though, the part of the prostate around the urethra may keep on growing. This causes *BPH* (*benign prostatic hyperplasia*) which can lead to problems passing urine because the prostate can press on the urethra. BPH is a problem that often must be treated, but it is not cancer.



Prostate cancer

There are several types of cells in the prostate, but nearly all prostate cancers start in the gland cells. This kind of cancer is known as *adenocarcinoma*. **The rest of the information here refers only to prostate adenocarcinoma.**

Some prostate cancers can grow and spread quickly, but most of the time, prostate cancer grows slowly. Autopsy studies show that many older men (and even younger men) who died of other diseases also had prostate cancer that never caused a problem during their lives. These studies showed that as many as 7 to 9 out of 10 men had prostate cancer by age 80. But neither they nor their doctors even knew they had it.

Pre-cancerous changes of the prostate

Some doctors believe that prostate cancer begins with very small changes in the size and shape of the prostate gland cells. These changes are known as *PIN (prostatic intraepithelial neoplasia)*. Almost half of all men have PIN by the time they reach age 50. In PIN, there are changes in how the prostate gland cells look under the microscope, but the cells are basically still in place -- they don't look like they've gone into other parts of the prostate (like cancer cells would). These changes can be either low-grade (almost normal) or high-grade (abnormal).

A prostate biopsy might also show a change called *atypical small acinar proliferation (ASAP)*. It is sometimes just called *atypia*. In ASAP, the cells look like they might be cancer when seen under the microscope, but there are too few of them on the slide to be sure. If ASAP is found, there's a high chance that cancer is also present in the prostate.

If you have had a prostate biopsy that showed high-grade PIN, ASAP, or certain other changes, there is a greater chance that there are cancer cells in your prostate. For this reason, you will be watched carefully and may need another biopsy.

How many men get prostate cancer?

The American Cancer Society's most recent estimates for prostate cancer in the United States are for 2011:

- About 240,890 new cases of prostate cancer
- About 33,720 deaths from prostate cancer

Prostate cancer is the most common type of cancer found in American men, other than skin cancer. Prostate cancer is the second leading cause of cancer death in men, behind only lung cancer. One man in 6 will get prostate cancer during his lifetime. And one man in 36 will die of this disease. More than 2 million men in the United States who have had prostate cancer at some point are still alive today.

What causes prostate cancer?

Prostate cancer is caused by changes in the DNA of a normal prostate cell. DNA makes up our genes, which control how cells behave. DNA is inherited from our parents. A small percentage (about 5% to 10%) of prostate cancers are linked to these inherited changes. Other DNA changes happen during a person's lifetime. Certain of these changes can cause prostate cancer.

Inherited DNA changes (mutations)

Several mutated (changed) genes have been found that may be linked to a man's being more likely to have prostate cancer. One of these is called HPC1 (**H**ereditary **P**rostate **C**ancer **G**ene **1**). But there are many other gene changes that may account for some cases of hereditary prostate cancer. None of these is a major cause, and more research on these genes is being done.

DNA changes that take place during a man's lifetime

Every time a cell prepares to divide into 2 new cells, it must copy its DNA. This process is not perfect, and sometimes mistakes happen, leaving the flawed DNA in the new cell. It is not clear how many of these DNA mutations might be random events and how many may be linked to other factors (diet, hormone levels, *etc.*). As a rule, the more quickly prostate cells grow and divide, the more chances there are for mutations to occur. Therefore, anything that speeds up this process may make prostate cancer more likely.

Prostate cancer may be linked to higher levels of certain hormones. High levels of male hormones (androgens) may play a part in prostate cancer risk in some men. Some researchers have noted that men with high levels of a hormone called IGF-1 are more likely to get prostate cancer, too. But others have not found such a link. More research is needed to make sense of these findings.

While we do not yet know exactly what causes prostate cancer, we do know that certain risk factors are linked to the disease. A risk factor is anything that increases a person's chance of getting a disease. Different cancers have different risk factors. Some risk factors, such as smoking, can be controlled. Others, like a person's age or family history, can't be changed.

But risk factors don't tell us everything. Many people with one or more risk factors never get cancer, while others with this disease may have had no known risk factors. For some of these factors, the link to prostate cancer risk is not yet clear.

Risk factors for prostate cancer

Age: Age is the strongest risk factor for prostate cancer. The chance of getting prostate cancer goes up quickly after a man reaches age 50. Almost 2 out of every 3 prostate cancers are found in men over the age of 65.

Race: For unknown reasons, prostate cancer is more common in African-American men than in men of other races. African-American men are also more likely to have a more advanced disease when it is found and are more likely to die of the disease. Prostate cancer occurs less often in Asian-American and Hispanic/Latino men than in non-Hispanic whites. The reasons for these racial and ethnic differences are not clear.

Nationality: Prostate cancer is most common in North America, northwestern Europe, and a few other places. It is less common in Asia, Africa, Central and South America. The reasons for this are not clear. More screening (testing of people who don't have any symptoms) in some developed countries may account for at least part of this difference, but other factors are likely to be important, too.

Family history: Prostate cancer seems to run in some families. Men with close family members (father or brother) who have had prostate cancer are more likely to get it themselves, especially if their relatives were young when they got the disease.

Genes: Scientists have found some inherited genes that seem to raise prostate cancer risk, but they probably account for only a small number of cases overall. Genetic testing for most of these genes is not yet available, and more study is needed in this area.

Diet: The exact role of diet in prostate cancer is not clear, but some factors have been studied. Men who eat a lot of red meat or high-fat dairy products seem to have a greater chance of getting prostate cancer. These men also tend to eat fewer fruits and vegetables. Doctors are not sure which of these factors causes the risk to go up.

Obesity: Most studies have not found that being obese (having a high amount of extra body fat) is linked with a higher risk of getting prostate cancer. Some, but not all, studies have found that obese men may be at greater risk for having more advanced prostate cancer and of dying from prostate cancer.

Exercise: Exercise has not been shown to reduce prostate cancer risk in most studies. But some studies have found that high levels of physical activity, especially in older men, may lower the risk of advanced prostate cancer. More research in this area is needed.

Smoking: A recent study linked smoking to a small increase in the risk of death from prostate cancer. This is a new finding, and will need to be confirmed by other studies.

Infection and inflammation of the prostate: Some studies have suggested that *prostatitis* (inflammation of the prostate gland) may be linked to an increased risk of prostate cancer, but other studies have not found such a link. Some researchers have also looked at whether sexually transmitted diseases (STDs) might increase the risk of prostate cancer. So far, studies have not agreed, and no clear links have been made.

Can prostate cancer be prevented?

The exact cause of prostate cancer is not known, so it is not possible to prevent most cases of the disease. But based on what we do know, some cases might be prevented.

Diet

While the results of research studies are not yet clear, you may be able to reduce your risk of prostate cancer by changing the way you eat. The ACS suggests eating less red meat and fat and eating more vegetables, fruits, and whole grains. Eat 5 or more servings of fruits and vegetables each day. These guidelines give you a healthy way to eat that may help lower your risk for some types of cancer, as well as other diseases.

Tomatoes, pink grapefruit, and watermelon are rich in substances called *lycopenes*. Lycopenes help prevent damage to DNA and may help lower prostate cancer risk. Research on this is still going on.

Vitamin and mineral supplements

Some studies suggest that taking vitamin E daily may lower the risk of prostate cancer. But others have found that vitamin E has no impact on cancer risk and might raise the risk for some kinds of heart disease. Selenium, a mineral, may also lower risk. A large study was done to see if vitamin E or selenium lowered prostate cancer risk. After about 5 years of use, the results showed that neither one was found to lower prostate cancer risk. In fact, when they looked at the men in the study a few years after they stopped taking the supplements, the men taking vitamin E had a higher risk of prostate cancer.

Taking any supplements can have both risks and benefits. Before starting any vitamins or other supplements, you should talk with your doctor.

Medicine

A study of the drug finasteride (Proscar[®]) found that men taking the drug were less likely to get prostate cancer than men taking a placebo ("sugar pill"). The drug can cause side effects such as lower sex drive and trouble getting an erection. On the other hand, it seems to help with urinary problems.

A drug called dutasteride (Avodart[®]) has also been studied to see if it can lower the risk of prostate cancer. Fewer cases of prostate cancer were found in the men who took dutasteride than in those who took the placebo. But men taking dutasteride had slightly more heart problems than those taking the placebo. As with finasteride, treatment with dutasteride was linked to lowered sex drive and problems with erections, but men on the drug had fewer urinary problems.

At this time it's not clear whether taking these drugs to lower the risk of prostate cancer is a good idea or not. The results of these studies may become clearer over the next few years.

Other drugs that may help prevent prostate cancer are now being tested in clinical trials. So far, no other supplement or drug has been studied in trials large enough to allow experts to make recommendations on whether or not they should be given to men.

How is prostate cancer found?

Screening refers to testing to find a disease such as cancer in people who do not have symptoms of that disease. Prostate cancer can often be found early by testing the amount of *PSA (prostate-specific antigen)* in your blood. Another way prostate cancer is found early is when the doctor does a *digital rectal exam (DRE)*. This is when a doctor puts a gloved finger into the rectum to feel the prostate gland. Because the prostate gland lies just in front of the rectum, during the DRE the doctor can feel if there are any bumps or hard places on the prostate. These might be cancer. If you have had routine yearly exams and either one of these test results becomes abnormal, any cancer you might have has probably been found at an early, more treatable stage.

Since about 1990 it has become more common for men to have tests to find prostate cancer early. The prostate cancer death rate has dropped, too. But we do not yet know if this drop is the direct result of the tests or caused by something else, like better treatments.

These tests are not perfect, though. Uncertain or false test results could cause confusion and worry. There is no question that the PSA test can help spot prostate cancer early. But it can't tell how dangerous the cancer is. The problem is that some prostate cancers are slow-growing and may never cause problems. But because of a high PSA level, many men will be found to have prostate cancer that would never have led to their deaths or even caused any problems. Often these men are being treated with either surgery or radiation, either because their doctor can't be sure how fast the cancer might spread or because the man is uncomfortable not having treatment. These treatments can lead to urinary or bowel problems or problems with sex. In some men these problems may be minor and go away quickly. But for others these problems can be severe and last a long time. Doctors and patients are still struggling to decide who should get treatment and who can be followed without treatment (called *watchful waiting*).

Studies are being done to try to figure out if early tests for prostate cancer in large groups of men will lower the prostate cancer death rate and help men live longer. The most recent results from 2 large studies didn't offer clear answers.

Until more is known, you should talk to your doctor about whether or not you want to be tested. Things to take into account are your age, your health, and the benefits and side effects of screening and treatment. If you are young and you get prostate cancer, it will probably shorten your life if it is not caught early. But if you are older or in poor health, then prostate cancer may never become a major problem because it often grows so slowly.

What the American Cancer Society recommends

The American Cancer Society recommends that men have a chance to make an informed decision with their health care provider about whether to be screened for prostate cancer. They should first get information about what is known and what is not known about the

risks and possible benefits of prostate cancer screening. Men should not be screened unless they have received this information.

The talk about screening should take place at age 50 for men who are at average risk of prostate cancer..

This talk should take place starting at age 45 for men at high risk of getting prostate cancer. This includes African American men and men who have a father, brother, or son found to have prostate cancer at an early age (younger than age 65).

This talk should take place at age 40 for men at even higher risk (those with several family members-- father, brother, son) who had prostate cancer at an early age).

If, after this talk, a man is not able to decide whether testing is right for him, the screening decision can be made by the health care provider, who should take into account the patient's overall health and values.

Men who choose to be tested and who have a PSA of less than 2.5 ng/ml (see below), may only need to be retested every 2 years.

Screening should be done yearly for men whose PSA level is 2.5 ng/ml or higher.

Because prostate cancer grows slowly, those men without symptoms of prostate cancer who aren't likely to live 10 more years should not be offered testing since they are not likely to benefit.

Even after a decision about testing has been made, men and their doctors should keep on talking about the pros and cons of testing as new information about the benefits and risks of testing becomes known. The patient's health, values, and choices can change as well.

The PSA blood test

PSA (prostate-specific antigen) is a substance made by the prostate gland. Although PSA is mostly found in semen, a small amount is also found in the blood. Most healthy men have levels under 4 ng/mL (nanograms per milliliter) of blood. The chance of having prostate cancer goes up as the PSA level goes up. If your level is between 4 and 10, you have about a 1 in 4 chance of having prostate cancer. If it is above 10, your chance is over 50%. But some men with a PSA below 4 can also have prostate cancer.

Factors other than cancer can also cause the PSA level to go up, including:

- **An enlarged prostate** like BPH (benign prostatic hyperplasia--not cancer), that many men get as they grow older.
- **Age:** PSA levels go up slowly as you get older, even if you have no prostate changes.
- **Infection or inflammation** of the prostate gland (prostatitis).
- **Ejaculation** can cause the PSA to go up for a short time, and then go down again.
- **Riding a bicycle**

- **Certain urology tests**

Some things can cause PSA levels to go down, even when cancer is present:

- **Certain medicines** used to treat BPH or urinary symptoms. You should tell your doctor if you are taking medicines for these problems, because the doctor will need to adjust the reading.
- **Some herbal mixtures** that are sold as dietary supplements may also hide a high PSA level. This is why it is important to let your doctor know if you are taking any type of supplement--even ones not meant for prostate health. Saw palmetto (an herb used by some men to treat BPH) does not seem to affect the measurement of PSA.
- **Obesity:** Very overweight men tend to have lower PSA levels.
- **Aspirin:** Men taking aspirin regularly tend to have lower PSA levels. This effect is most pronounced in non-smokers.

There are a number of new types of PSA tests that might help to show whether or not you need more testing. Not all doctors agree on how to use these new PSA tests. You should talk to your doctor about your cancer risk and any tests that you are having.

Use of the PSA blood test after prostate cancer has been found

Although the PSA test is used mainly to find prostate cancer early, it has other uses, too.

- In men diagnosed with prostate cancer, it can be used along with other results to help decide which types of tests are needed.
- A very high PSA level might mean that the cancer has spread beyond the prostate. This also helps determine treatment because some forms of treatment are not as helpful for cancer that has spread to the lymph nodes or other organs.
- The PSA test can also be used to help show if treatment is working, how well it is working, or whether the cancer has come back after treatment.
- If you choose a "watchful waiting" approach, the PSA level can be used to help decide if the cancer is growing and whether you should think about starting treatment.
- If you are having hormone therapy or chemo, the PSA level can help tell how well the treatment is working or when it may be time to try a different form of treatment.

If prostate cancer has come back (recurred) after treatment, or if it has spread outside of the prostate (metastatic disease), the actual PSA number may not be as important as whether it changes and how quickly it changes. The PSA number does not tell whether or not a man will have symptoms or how long he will live. Many people have very high PSA values and feel just fine. Other men have low values and have symptoms.

DRE (digital rectal exam)

To do the DRE, the doctor puts a gloved, lubricated finger into the rectum to feel for any irregular or firm areas that might be cancer. The prostate gland is next to the rectum, and most cancers begin in the part of the gland that can be reached by rectal exam. The exam is uncomfortable, but it isn't painful and takes only a short time. It is more uncomfortable in men who have hemorrhoids.

The DRE is less effective than the PSA blood test in finding prostate cancer, but it can sometimes find cancers in men with normal PSA levels. For this reason, it may be done as a part of prostate cancer screening. The DRE is also used once a man is known to have prostate cancer. It can help tell whether the cancer has spread beyond his prostate gland. It can also be used to find cancer that has come back after treatment.

Transrectal ultrasound (TRUS)

Transrectal ultrasound (TRUS) uses sound waves to make a picture of the prostate on a video screen. For this test, a small probe is placed in the rectum. It gives off sound waves, which enter the prostate and create echoes that are picked up by the probe. A computer turns the pattern of echoes into a black and white picture of the prostate.

The test takes only a few minutes. You will feel some pressure when the TRUS probe is placed in your rectum, but it is usually not painful. TRUS is usually not used as a screening test for prostate cancer because it doesn't often show early cancer. It is most often used during a prostate biopsy to guide the biopsy needles into the right area of the prostate.

TRUS is used for other things as well. It can be used to measure the size of the prostate gland, which can help the doctor interpret the PSA level. It may also affect which treatment options a man has. It is also used as a guide during some forms of treatment such as cryosurgery (discussed in the Treatment section).

If cancer is suspected

Signs and symptoms of prostate cancer

Early prostate cancer often causes no symptoms. It may be found by a PSA test or DRE. Problems with urinating could be a sign of advanced prostate cancer, but more often this problem is caused by a less serious disease known as BPH (benign prostatic hyperplasia).

Symptoms of advanced prostate cancer are:

- Trouble having or keeping an erection (impotence)
- Blood in the urine
- Pain in the spine, hips, ribs, or other bones

- Weakness or numbness in the legs or feet
- Loss of bladder or bowel control

Once again, other diseases also can cause these symptoms.

If certain symptoms or the results of early tests suggest you might have prostate cancer, your doctor will do a prostate biopsy to find out whether the disease is present.

The prostate biopsy

A biopsy is the only way to know for sure if you have prostate cancer. During a biopsy, tissue from the prostate is removed so it can be sent to the lab to see if it contains cancer cells. A core needle biopsy is the type of biopsy used most often. Here is how it's done:

A small probe is placed in the rectum. The probe gives off sound waves which make a picture of the prostate on a video screen. This technique is called TRUS (transrectal ultrasound). Guided by TRUS, the doctor puts a thin needle through the wall of the rectum into the prostate gland. When the needle is pulled out, it takes out a piece of tissue, usually about ½ inch long and 1/16 inch across. This is done from 8 to 18 times, but most doctors will take about 12 samples. Samples are often taken from different parts of the prostate. Ask your doctor how many samples will be taken. Some doctors do the biopsy through the skin between the rectum and the scrotum.

Although the test sounds painful, it usually causes little discomfort because it is done very quickly. The doctor can numb the area ahead of time. You might want to ask your doctor about doing this.

The biopsy takes about 10 minutes and is usually done in the doctor's office. You will likely be given antibiotics to take ahead of time and afterwards to reduce the chance of infection. For a few days afterwards you may notice some soreness, rust-colored urine, or light bleeding from the rectum. Many men also see some blood in their semen or have rust colored semen, which can last for several weeks after the biopsy.

Cancer may only be present in a small area of the prostate. Because of this, sometimes the biopsy will miss the cancer even when it is there. This is known as a "false negative." If your biopsy doesn't show cancer, but your doctor still strongly suspects cancer, a repeat biopsy may be needed.

Grading the prostate cancer

The biopsy sample will be sent to a lab. A doctor there will look for cancer cells in the sample. If cancer is present, the sample will be graded. Grading the cancer helps to predict how fast the cancer is likely to grow and spread.

Prostate cancers are graded on the basis of how closely the cells in the sample look like normal prostate cells. Those that look very different from normal cells are likely to mean a cancer that grows faster. The system used most often for grading prostate cancer is called the *Gleason system*.

Samples from 2 areas of the prostate are each graded from 1 to 5, and the number grades are added to give a *Gleason score* or *sum* of between 2 and 10. The lower the number, the more the cells in the sample look like normal prostate cells. A higher score means the cells look less normal and the cancer is likely to grow more quickly. Ask your doctor to explain the grade of your cancer because it is an important factor in making treatment decisions.

Sometimes the cells don't look like cancer but they don't look really normal either. In these cases, more biopsies may be done later.

Other things you may see on a biopsy report

The biopsy report tells you the grade of the cancer (if it is present), but it also often provides other information that may give a better idea of the scope of the cancer. These can include:

- The number of biopsy samples that contain cancer (for example, "7 out of 12")
- The amount of cancer in each of the cores (given as a percentage)
- Whether the cancer is on one side (left or right) of the prostate or both sides (bilateral)

After the tests: Staging

If the biopsy finds cancer, more tests may be done to see whether the cancer has spread and if so, how far. This process is called *staging*. Staging is very important because your treatment and the outlook for your recovery depend on the stage of your cancer.

Based on your DRE results, PSA blood test results, and the Gleason score of the cancer, other tests may be done to stage your cancer. Men with a normal DRE result, a low PSA, and a low Gleason score may not need any other tests because the chance that the cancer has spread is so low.

A complete physical exam (including the DRE) is an important part of prostate cancer staging. The doctor will look at other parts of your body to see if the cancer has spread. He or she will also ask you about symptoms, such as bone pain which could be a sign of spread to your bones.

Imaging tests used for prostate cancer staging

Not all men with prostate cancer need to have more tests, but for those who do, the tests below are sometimes used.

Bone scan

When prostate cancer spreads, it often goes to the bones first. (Even when this happens, it is still called prostate cancer, not bone cancer.) A bone scan is done to show whether the cancer has spread from the prostate gland to bones. For this test, a radioactive material is

put into your vein (given IV). The dose of radiation is very low and does not cause side effects. The radioactive substance is drawn to diseased bone cells throughout the body and shows up on the bone scan as "hot spots." These places could be cancer, or they could be caused by arthritis or other bone diseases. To find out, more tests may need to be done.

CT scan (computed tomography)

A CT or CAT scan is a special type of x-ray. A series of pictures is taken from many angles. A computer combines the pictures to give a detailed image. For some scans, you may be asked to drink 1 or 2 pints of a liquid that outlines the intestine so that it looks different from any tumors. You might also have a harmless dye put into your vein (given IV).

A CT scan can help tell if your prostate cancer has spread into lymph nodes in your pelvis. (Lymph nodes are a network of bean-sized collections of white blood cells that fight infection.) CT scans take longer than regular x-rays. You need to lie still on a table inside a ring-shaped machine. You might feel a bit confined by the ring you have to lie in while the pictures are being taken. This test can help tell whether prostate cancer has spread into nearby lymph nodes. If your prostate cancer has come back after treatment, the CT scan can often tell whether it is growing into other organs in your pelvis. CT scans are not as useful as MRIs for looking at the prostate gland itself.

MRI (magnetic resonance imaging)

This test is like a CT scan except that radio waves and strong magnets are used instead of x-rays to make the pictures. The MRI gives a very clear picture to help the doctor see whether the cancer has spread to the seminal vesicles or the bladder. Because the scanners use magnets, people with pacemakers, certain heart valves, or other medical implants may not be able to get an MRI.

MRI scans take longer than CT scans--often up to an hour. During the scan you lie in a narrow tube which is confining and can upset some people. In order to get a better picture, many doctors will place a probe inside the rectum. It must stay in place for 30 to 45 minutes and can be uncomfortable. Like CT scans, a contrast dye might be put into your vein, but this is done less often.

ProstaScintTM scan

Like the bone scan, the ProstaScint scan uses low levels of a radioactive substance to find cancer that has spread beyond the prostate. The substance is put into your vein and is drawn to prostate cells anywhere in the body. You will be asked to lie on a table while a special camera takes pictures of your body. This is usually done about half an hour after the injection and again 3 to 5 days later.

The advantage of this test is that it finds the spread of prostate cancer to lymph nodes and other organs. And it can tell the difference between prostate cancer and other problems.

Doctors are not yet sure how useful this test is and most don't use it for men who have just been diagnosed with prostate cancer.

Lymph node biopsy

In a lymph node biopsy, one or more lymph nodes are removed to see if they contain cancer cells. If your cancer has spread to nearby lymph nodes, surgery to cure the cancer is usually not an option and the doctor will look at other treatment choices. Lymph node biopsies are rarely done unless your doctor is concerned that the cancer has spread. There are different types of biopsies.

Surgical biopsy

The surgeon might remove lymph nodes through a cut (incision) in the lower part of the belly (abdomen). This biopsy is often done during the operation to remove the prostate. The lymph nodes are tested in the lab while you are still asleep (under anesthesia). The results will help the surgeon decide whether or not to go on with the surgery. If the nodes contain cancer, the operation is may be stopped. This is because taking out the prostate would be unlikely to cure the cancer, but it could still cause serious problems or side effects. But more often now, the prostate is removed even if the lymph nodes contain cancer.

Laparoscopy

A laparoscope is a long, thin tube with a small camera on the end. It is put into the belly (abdomen) through a small cut (incision) in the skin to let the surgeon see inside without making a large cut. Other small cuts are made to put in long instruments to remove lymph nodes. Recovery usually takes only 1 or 2 days and there is very little scarring from this operation. This method is not common, but it is sometimes used when a man is not having surgery, for instance for men who choose treatment with radiation.

Fine needle aspiration (FNA)

If a CT or MRI scan shows that your lymph nodes seem to be swollen, a sample of cells may be taken by doing a fine needle aspiration (FNA). The doctor first numbs the skin and then uses the CT scan to guide a long, thin (fine) needle through the skin and into the lymph nodes. This is an outpatient procedure and you can go home a few hours later.

Putting it all together to get the stage of the cancer

A staging system is a way to describe the extent to which the cancer has spread. There are different staging systems for prostate cancer. Most doctors use the AJCC (American Joint Committee on Cancer) system. Many factors are taken into account when deciding the stage of a cancer. In simple terms, stages are expressed using Roman numerals.

After looking at your test results, the doctor will tell you the stage of your cancer. Be sure to ask your doctor to explain your stage in a way you understand. This will help you work with your doctor to decide on your treatment.

Clinical stage

There are really 2 types of staging for prostate cancer. The *clinical stage* is your doctor's best estimate of the extent of the disease, based on the results of the physical exam, lab tests, and any other tests you have had.

Pathological stage

If you have surgery, tissue will be removed and looked at in the lab. The results will give the *pathological stage*. This means that if you have surgery, the stage of your cancer might change. Pathologic staging is likely to be more accurate than clinical staging,

The AJCC (American Joint Committee on Cancer) staging system

In the AJCC (American Joint Committee on Cancer) staging system, stages of prostate cancer are labeled using Roman numerals I through IV (1 - 4). As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV (4), means a more advanced cancer.

You can ask your doctor to explain more about the stage of your cancer and how it relates to your treatment options.

Survival rates for prostate cancer

Some people with cancer may want to know the survival rates for their type of cancer. Others may not find the numbers helpful, or may even not want to know them. Whether or not you want to read about survival rates is up to you.

The National Cancer Institute (NCI) keeps a database of survival statistics for different types of cancer. This database does not group prostate cancers by AJCC stage but instead divides them into local, regional, and distant stages.

Local stage means that there is no sign that the cancer has spread outside of the prostate. This is like AJCC stages I and II. Almost 9 out of 10 prostate cancers are found in this early stage. If the cancer has spread from the prostate to nearby areas, it is called *regional* disease. This includes cancers that are stage III and the stage IV cancers that haven't spread to distant parts of the body. *Distant* stage includes the rest of the stage IV cancers -- all cancers that have spread to distant lymph nodes, bone, or other organs.

5-year relative survival by stage at the time of diagnosis

Stage	5-year relative survival
local	100%
regional	100%
distant	31%

The 5-year relative survival rate compares the number of people who are still alive 5 years after their cancer was found to the survival of others the same age who don't have cancer. Of course, patients might live more than 5 years after diagnosis. These 5-year survival rates are based on men with prostate cancer first treated more than 5 years ago. Treatment has gotten better since then and for recently diagnosed patients this may result in a better outlook.

While these numbers give you an overall picture, keep in mind that every man is unique and the statistics can't predict exactly what will happen in your case. Talk with your cancer care team if you have questions about your own chances of a cure, or how long you might expect to live. They know your situation best.

How is prostate cancer treated?

This information represents the views of the doctors and nurses serving on the American Cancer Society's Cancer Information Database Editorial Board. These views are based on their interpretation of studies published in medical journals, as well as their own professional experience.

The treatment information in this document is not official policy of the Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor.

Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.

Some general comments about treatment

There is a lot for you to think about when choosing the best way to treat or manage your cancer. There may be more than one treatment to choose from. You may feel that you need to make a decision quickly. But give yourself time to take in all the information you have learned. Talk to your doctor. Look at the list of questions at the end of this article to get some ideas. Then add your own.

The treatment you choose for prostate cancer should take into account:

- Your age and how long you can expect to live
- Any other serious health problems you may have

- The stage and grade of your cancer
- Your feelings (and your doctor's opinion) about the need to treat the cancer
- The chance that each type of treatment will cure your cancer (or help you on some other way)
- Your feelings about the side effects common with each treatment

You may want to get a second opinion, especially if you have many treatments to choose from. Prostate cancer is a complex disease, and doctors may differ in their opinions about the best treatment options. Talking with doctors who specialize in different kinds of treatment may be helpful. You will want to weigh the benefits of each treatment against its drawbacks, side effects, and risks.

Watchful waiting and active surveillance

Because prostate cancer often grows very slowly, some men (especially those who are older or who have other major health problems) may never need treatment for their cancer. Instead, their doctor may suggest approaches called watchful waiting (also called expectant management or active surveillance).

Until recently, watchful waiting meant waiting until the cancer was causing symptoms before starting any treatment. Now, it is more common to watch the patient closely with regular PSA tests, rectal exams, and ultrasounds to see if the cancer is growing. If the cancer does seem to be growing or getting worse, the doctor may suggest starting treatment. Some doctors still think of this as watchful waiting, while others call it "active surveillance." Not every doctor means the same thing when they say "watchful waiting," so it is important to ask your doctor what he or she means if they use this term.

Right now, not all experts agree how often testing should occur for active surveillance. There is also debate about when is the best time to start treatment. Still, some early studies have shown that men who choose active surveillance and go on to be treated do just as well as those who decide to start treatment right away.

Either of these methods may be a good choice if the cancer is not causing any symptoms, is likely to grow slowly, and is small and contained in one place in the prostate. It is less often a choice if you are young, healthy, and have a cancer that is growing fast.

Some men choose watchful waiting because, in their view, the side effects of strong treatments outweigh the benefits. Others are willing to accept the possible side effects of active treatments in order to try to remove or destroy the cancer.

Surgery

Radical prostatectomy is surgery that is done to cure prostate cancer. It is used most often if it looks like the cancer has not spread outside of the gland. In this operation, the surgeon removes the whole prostate gland plus some of the tissue around it, including the seminal vesicles.

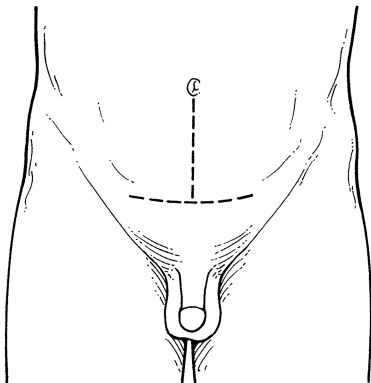
Types of radical prostatectomy

Radical retropubic prostatectomy: This approach is most common. The cut (incision) is made in the lower belly (abdomen), as shown in the picture below. You will either be in a deep sleep (under general anesthesia) or be given medicine to numb the lower half of the body (an epidural) along with drugs to make you sleepy (sedation).

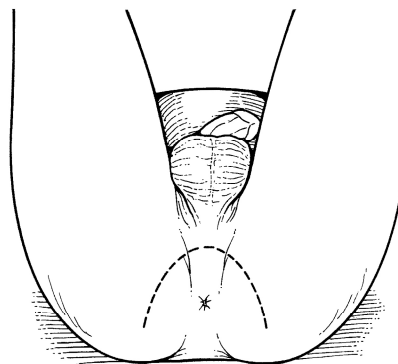
Your doctor may first remove lymph nodes near the prostate and have them looked at under a microscope. If any of the nodes contain cancer, it means the cancer has spread. Since the cancer probably can't be cured by taking out the prostate, the doctor might stop the operation.

The nerves that control erections are very close to the prostate. During this operation, it is sometimes possible to avoid harming these nerves (called a *nerve-sparing approach*). This lowers-- but does not do away with-- the risk of impotence (being unable to have an erection) after surgery. If you were able to have erections before, the doctor will try not to injure these nerves. Of course, if the cancer is growing into them, the doctor will have to remove them. Even if the nerves have not been removed, it takes at least a few months after surgery to have an erection. This is because the nerves have been handled during the operation and won't work right for a while.

Radical perineal approach: In the perineal approach, the surgeon makes the cut (incision) in the skin between the anus and the scrotum, as shown in the picture below. Nerve-sparing operations are harder to do with the perineal approach, and lymph nodes cannot be removed. Still, the surgeon can remove some lymph nodes another way, if needed. Because this operation is often shorter, it might be used for men who don't want the nerve-sparing procedure and who don't need to have lymph nodes removed. It also might be used if you have other medical problems that make retropubic surgery hard to do.



Retropubic Approach



Perineal Approach

Either of these operations lasts from 1½ to 4 hours. The perineal approach often takes less time than the retropubic approach. They are followed by an average hospital stay of 1 to 3 days. The time away from work is about 3 to 5 weeks.

In most cases, you will be able to donate your own blood before surgery. The blood can be given back to you during the operation, if needed. Usually a tube for draining urine (called a catheter) is put into the bladder through the penis after surgery, while you are still asleep. The catheter stays in place for 1 to 2 weeks and allows you to pass urine easily while you are healing. You will be able to urinate on your own after the catheter is removed.

Laparoscopic radical prostatectomy (LRP): Both of the operations described above use an "open" approach in which the surgeon makes a long cut (incision) to remove the prostate. A newer method involves making several smaller cuts and using special long instruments to remove the prostate. It is called *laparoscopic radical prostatectomy* or LRP and is being used more and more in this country.

LRP has advantages over the open approach: less blood loss and pain, shorter hospital stays, and faster recovery time. Nerve-sparing is possible with LRP, and the side effects seem to be about the same as for open prostatectomy. Early studies report that the rates of side effects from LRP seem to be about the same as for open prostatectomy. Recovery of bladder control may take a little longer with this approach.

LRP has been used in the United States since 1999. It is done in community and university centers. Because it is still somewhat new, results of long-term studies are not in yet. If you are thinking about treatment with LRP, find out as much as you can about this approach.

Robotic-assisted laparoscopic radical prostatectomy: An even newer approach is to do LRP remotely using a robotic interface. The surgeon sits at a panel near the operating table and controls robotic arms to do the operation through several small cuts (incisions) in the patient's belly (abdomen). Like direct LRP, the robotic approach has advantages over the open approach in terms of pain, blood loss, and recovery time. So far though, there is little difference between direct and remote (robotic) LRP, either during surgery or recovery.

Robotic LRP has been in use in the United States since 2003. The machines themselves cost a lot, and aren't found in every medical center. Still, this approach has become more popular in recent years. Again, the most important factors are likely to be the skill and experience of your surgeon. If you decide that LRP is the treatment for you, be sure to find a surgeon with a lot of experience doing LRP.

Transurethral resection of the prostate (TURP): This procedure is done to relieve symptoms, such as trouble passing urine, in men who can't have other types of surgery. It is not done to cure the disease or to remove all the cancer. The same operation is used even more often to relieve symptoms of non-cancerous prostate swelling called BPH.

During this operation, a tool with a small loop of wire on the end is placed through the end of the penis into the urethra. The wire is heated and cuts out the part of the prostate that is pressing in on the urethra. No cut (incision) is needed for TURP. Either spinal anesthesia, where you are made numb from the waist down, or general anesthesia, which puts you into a deep sleep, is used.

The operation takes about an hour. You can usually leave the hospital after 1 to 2 days and go back to work in 1 to 2 weeks. After surgery you will need a tube for draining urine (called a catheter) for about a day. There may be some blood in your urine for a short time after surgery.

Risks and side effects of radical prostatectomy

There are possible risks and side effects with any type of surgery for prostate cancer.

Surgical risks: The risks with this surgery are like those of any major surgery. They can include problems from the drugs used during the operation (anesthesia), a small risk of heart attack, stroke, blood clots in the legs, infection, and bleeding. Your risk depends, in part, on your overall health, your age, and the skill of your doctors.

The main possible side effects of radical prostatectomy are lack of bladder control (incontinence) and not being able to get an erection (impotence). These side effects can also happen with other kinds of treatment but they are described here in more detail.

Urinary incontinence: Incontinence means you can't control your urine or you have trouble with leaking. There are different types of incontinence. Having this problem can affect you not only physically but emotionally and socially, too.

There are 3 types of incontinence:

- *Stress incontinence* is the most common type of incontinence after prostate surgery. Men with stress incontinence leak urine when they cough, laugh, sneeze, or exercise.
- Men with *overflow incontinence* take a long time to urinate and have a dribbling stream with little force.
- Men with *urge incontinence* have a sudden need to go to the bathroom and pass urine.

In rare cases, men lose all ability to control their urine. This is called *continuous incontinence*.

Normal bladder control returns for many men within several weeks or months after surgery. Doctors can't predict how any one man will do after prostate surgery. As a rule, older men tend to have more incontinence problems than younger men

Most large cancer centers, where this surgery is done more often and surgeons have more experience, report fewer problems with incontinence. If you have problems with incontinence, let your doctors know. Doctors who treat men with prostate cancer should know about incontinence, and should be able to suggest ways to help you. There are exercises (called Kegel exercises) you can learn that might help to strengthen your bladder. There are medicines or even surgery that might help. There are also products to help keep you dry and comfortable.

Impotence: Impotence means that a man can't get an erection strong enough to have sex. The nerves that allow men to get erections may be damaged during surgery, radiation treatment, or other treatments. Getting back sexual function can take up to 2 years after

surgery. During the first several months, you will probably not be able to get an erection without using medicine or some other treatment. Later, some men will be able to get an erection and some will still have trouble. Whether or not you will be able to get an erection depends on your age and the type of surgery that was done. The younger you are, the more likely it is that you will be able to get an erection. If you are able to get an erection the feeling of pleasure (orgasm) during sex will still be there. The orgasm will be "dry," though, since semen is not being made.

If you are concerned about erection problems, be sure and talk to your doctor. There are ways to help. There are medicines and even devices such as vacuum pumps and penile implants that could prove useful.

For more information to help you understand and cope with the sexual side effects of prostate cancer treatment, please see *Sex and Men With Cancer--Overview*. You can order it through our toll-free number or find it on our Web site.

Changes in orgasm can be a side effect of prostatectomy. In some men, orgasm becomes less intense or goes away completely. A few men report pain with orgasm. Even if you have problems with impotence, you may still be able to have an orgasm.

Sterility: A radical prostatectomy cuts the tubes between the testicles (where sperm are made) and the urethra. This means that a man can no longer father a child by natural means. Often this is not an issue as men with prostate cancer tend to be older. But if this is a concern for you, talk to your doctor about "banking" your sperm before the operation.

Lymphedema: A very rare side effect of removing many of the lymph nodes around the prostate is lymphedema, which causes swelling and pain in the legs or groin. Lymph nodes provide a way for fluid to return from all around the body to the heart. When the nodes are removed, fluid can collect in the legs or genital region. Lymphedema can often be treated with physical therapy, but it might not go away completely.

Change in penis length: Another possible side effect of surgery is a decrease in penis length. Doctors are not sure what causes this.

Inguinal hernia: A prostatectomy also raises the chance of needing an inguinal (groin) hernia repair in the future.

Radiation therapy

Radiation therapy is treatment with high-energy rays (such as x-rays) to kill cancer cells or shrink tumors. The radiation may come from outside the body (external radiation) or from radioactive materials placed directly in the tumor (brachytherapy or internal radiation).

Radiation is sometimes used as the first treatment for low-grade cancer that has not spread outside the prostate gland, or has spread only to nearby tissue. It is also sometimes used if the cancer is not completely removed or comes back (recurs) in the area of the prostate after surgery. Cure rates for men treated with radiation seem to be about the

same as for men having surgery. If the cancer is more advanced, radiation may be used to shrink the tumor and provide pain relief.

External beam radiation therapy (EBRT)

This treatment is much like getting a regular x-ray, but for a longer time. Each treatment lasts only a few minutes. Men usually have 5 treatments per week in an outpatient center over a period of 7 to 9 weeks. The treatment itself is quick and painless.

Today, standard EBRT is used much less often than in the past. Newer methods allow doctors to be more accurate in treating the prostate gland while reducing the radiation exposure to nearby healthy tissues. Some of these methods you may hear about are 3-dimensional conformal radiation therapy (3D-CRT), intensity modulated radiation therapy (IMRT), and conformal proton beam radiation therapy. These methods seem to offer better chances of increasing the success rate and reducing side effects. If you are having one of the newer methods, your doctor can tell you more about it.

Possible side effects of external beam radiation therapy

The possible side effects below relate to standard external radiation therapy, which is now used much less often than in the past. The risks of the newer treatment methods mentioned above are likely to be lower.

Bowel problems: During and after treatment with external beam radiation therapy, you may have diarrhea, sometimes with blood in the stool, rectal leakage, and an irritated large intestine. Most of these problems go away over time, but in rare cases normal bowel function does not return after treatment ends.

Bladder problems: You might find yourself needing to urinate more often, have burning while passing urine, and maybe see blood in your urine. Bladder problems last in about 1 out of 3 patients, with the most common problem being the need to urinate often.

Urinary incontinence: Incontinence means you can't control your urine or you have trouble with leaking. Although this side effect is less common with radiation than surgery, the chance of incontinence goes up each year for several years after radiation treatment. For more information, see the section on urinary incontinence under "Risks and side effects of radical prostatectomy" in the "Surgery" section.

Impotence: Impotence means that a man can't get an erection strong enough to have sex. It usually does not happen right after radiation therapy but slowly develops over a year or more. After a few years, the impotence rate after radiation is about the same as that of surgery. As with surgery, the older you are, the more likely it is you will become impotent. Impotence may be helped by treatments such as those listed in the "Surgery" section, including erectile dysfunction medicines.

Feeling tired: Radiation treatment may also cause severe tiredness called fatigue. It may not go away until a few months after treatment stops.

Lymphedema: Fluid build-up in the legs or genitals (described in the "Surgery" section of this document) is possible if the lymph nodes receive radiation.

Urethral Stricture: The tube that transmits urine from the bladder out of the body may, rarely, be scarred and narrowed by radiation, and need further treatments to open it up again.

Brachytherapy (internal radiation)

Permanent or low dose brachytherapy uses small radioactive pellets (each about the size of a grain of rice) that are put into the prostate. Sometimes these pellets are referred to as "seeds." Because they are so small, they cause little discomfort and are often left in place after their radioactive material is used up. As a rule, this treatment is used only in men with early stage prostate cancer that is slow growing.

Another form of brachytherapy is called *temporary or high dose brachytherapy*. In this type, needles are used to place soft tubes (called catheters) in the prostate. A strong radioactive substance is placed in these catheters for 5 to 15 minutes and then taken out. (The catheters are left in place.) You will stay in the hospital for this treatment. Usually 3 treatments are given over a couple of days. After the last treatment the catheters are removed. Often this treatment is combined with external radiation, given at a lower dose than it would be if used alone. For about a week after this treatment you may have some pain in the area between your scrotum and rectum, and your urine may be reddish-brown.

Possible risks and side effects of brachytherapy

If you have pellets that are left in place, they will give off small amounts of radiation for several weeks. Even though the radiation doesn't travel far, you may be told to stay away from pregnant women and small children during this time. You may be asked to be careful in other ways, too, such as wearing a condom during sex.

For about a week after the pellets are put in place, there may be some pain in the area and a red-brown color to the urine. There is also a small risk that some of the seeds might move to other parts of the body, but this is rare. Like external radiation treatment, this approach can have side effects such as problems with the bladder and bowel and impotence. Talk to your doctor if you have any problems. Often there are medicines or other methods to help.

Cryosurgery

Cryosurgery is sometimes used to treat prostate cancer by freezing the cells with cold metal probes. It is used only for prostate cancer that has not spread, but may not be a good option for men with large prostate glands. The probes are placed through cuts (incisions) between the anus and the scrotum. Cold gases are then passed through the probes, which creates ice balls that destroy the prostate gland. Some type of drug to make you numb and sleepy (anesthesia) is used during this procedure.

A catheter is also put into the bladder so that when the prostate swells (as it often does after this treatment) urine is not trapped in the bladder. The catheter is removed a couple of weeks later. After the procedure, there will be some bruising and soreness in the area where the probe was inserted. You may have some blood in the urine for the first few days. Short-term swelling of the penis and scrotum after cryosurgery is also common. You may need to stay in the hospital for a day, but many patients can leave the same day.

Possible side effects of cryosurgery

There are benefits and drawbacks to cryosurgery. Because it is less invasive than radical surgery, there is less loss of blood, a shorter hospital stay, shorter recovery time, and less pain. But freezing can damage nerves near the prostate and cause impotence and incontinence. These side effects may occur more often with cryosurgery than they do after radical prostatectomy. Freezing may also damage the bladder and intestines. This can cause pain, a burning sensation, and the need to empty the bladder and bowels often.

Compared to surgery or radiation treatment, doctors know much less about how well this method works in the long run. For this reason, most doctors do not include cryosurgery among the first options they recommend for treating prostate cancer.

Hormone therapy

The goal of hormone therapy (also called *androgen deprivation*) is to lower the levels of the male hormones (androgens), such as testosterone. Androgens, which are made mostly in the testicles, cause prostate cancer cells to grow. Lowering androgen levels often makes prostate cancer shrink or grow more slowly. Hormone therapy can control but will not cure the cancer. It does not take the place of treatments aimed at a cure.

Hormone therapy is often used in these cases:

- In men for whom surgery or radiation are not good treatment options.
- For men whose cancer has spread to other parts of the body or has come back after earlier treatment.
- Along with radiation in men who are at high risk of having the cancer return after treatment.
- Sometimes it is used before surgery or radiation to shrink the cancer.

While hormone therapy does not cure the cancer, it can provide relief from symptoms. Some doctors think that hormone therapy works better if it is started as early as possible after the cancer has reached an advanced stage. But not all doctors agree with this.

Because nearly all prostate cancers become resistant to hormone therapy over time, some doctors use an on-again, off-again approach (this is called *intermittent therapy*). The drugs are given for a while, then stopped, then started again. One advantage is that some men are able to avoid the side effects (impotence, loss of sex drive, *etc.*) for a time.

Studies are now going on to see whether this new approach is better or worse than giving the drugs non-stop.

Types of hormone therapy

There are several types of hormone therapy. They involve either surgery or the use of drugs to lower the amount of testosterone or block the body's ability to use androgens.

Orchiectomy: Even though this is a type of surgery, its main effect is as a form of hormone therapy. In this operation, the surgeon removes the testicles where more than 90% of the androgens, mostly testosterone, are made. While this is a fairly simple procedure and is not as costly as some other options, it is permanent and many men have trouble accepting this operation. Most men who have this surgery lose the desire for sex and cannot have erections.

LHRH analogs (luteinizing hormone-releasing analogs): These drugs lower testosterone levels just as well as orchiectomy. LHRH analogs (also called LHRH agonists) are given as shots or as small pellets of medicine put under the skin. Depending on the drug used, they are given anywhere from every month, every 3 or 4 months, up to once a year. Even though this treatment costs more and means more doctor visits, most men choose this method over surgery to remove the testicles. These drugs allow the testicles to remain in place, but the testicles will shrink over time, and they may even become too small to feel.

When LHRH analogs are the first given, the testosterone level goes up briefly before going down to low levels. This is called "flare." Men whose cancer has spread to the bones may have bone pain during this flare. To reduce flare, drugs called anti-androgens can be given for a few weeks before starting treatment with LHRH analogs.

LHRH antagonists: Degarelix (Firmagon[®]) is a LHRH antagonist approved for use by the FDA in 2008 to treat advanced prostate cancer. It is given as a monthly shot under the skin. This drug quickly lowers testosterone levels without causing a flare. The most common side effects are pain, redness, and swelling at the place where the shot was given and increased levels of liver enzymes on lab tests.

Anti-androgens: These drugs block the body's ability to use any androgens. Even after the testicles are removed or during LHRH treatment, the adrenal glands still make a small amount of androgens. Anti-androgens may be used along with orchiectomy or the LHRH analogs to provide *combined androgen blockade (CAB)*, or total blocking of all androgens produced by the body. There is still debate about whether CAB is better than using the other treatments alone.

Other drugs to lower androgen levels: At one time estrogens (female hormones) were used to treat men with prostate cancer. Because of side effects, LHRH analogs and anti-androgens are now used more often. But estrogen or some other drugs may be used if other hormone treatments are no longer working. Ketoconazole (Nizoral[®]) blocks androgens. It is most often used to treat patients with recently diagnosed disease and a large amount of cancer, as it is the quickest way to lower testosterone levels

Side effects of hormone therapy

Orchiectomy, LHRH analogs, and LHRH antagonists all cause side effects because of changes in the levels of hormones. These side effects can include:

- Less sexual desire
- Impotence (not being able to get an erection)
- Hot flashes (these may get better or even go away with time)
- Breast tenderness and growth of breast tissue
- Bone thinning (osteoporosis) which can lead to broken bones
- Low red blood cell counts (anemia)
- Decreased mental sharpness
- Loss of muscle mass
- Weight gain
- Extreme tiredness (fatigue)
- Increased cholesterol
- Depression

The risk of high blood pressure, diabetes, and heart attacks is also higher in men treated with hormone therapy.

Many side effects can be prevented or treated. For example, hot flashes can be helped by treatment with certain antidepressants. Brief radiation treatment to the breasts can help prevent their enlargement (but it is not effective once breast enlargement has occurred). There are drugs available to prevent and treat osteoporosis. Depression can be treated by antidepressants or counseling. Exercise can help reduce many side effects, including fatigue, weight gain, and the chance of loss of bone and muscle mass. If anemia occurs, it is often very mild and usually doesn't cause symptoms.

There is growing concern that hormone therapy for prostate cancer may lead to problems with thinking, concentration, or memory. But this link has not been studied well in men getting hormone therapy for prostate cancer. Different studies have shown changes in different types of memory. Some have even found that while some types of memory get worse, another type got better. Other studies found no effect at all. More studies are being done to look at this issue.

Debates about hormone therapy

Many issues about hormone therapy are not yet resolved, such as the best time to start and stop it and the best way to give it. Studies looking at these issues are now going on. If

you are thinking about hormone therapy, ask your doctor to explain which treatments will be used and what side effects you might expect to have.

Chemotherapy (chemo)

Chemo is the use of drugs to treat cancer. The drugs are often injected into a vein (given IV). Some can be swallowed in pill form. Once the drugs enter the bloodstream, they spread throughout the body to reach and destroy the cancer cells.

Chemo is sometimes used if prostate cancer has spread outside of the prostate gland when hormone therapy isn't working. It is not a standard treatment for early prostate cancer, but some studies are looking to see if chemo could be helpful if given for a short time after surgery.

Like hormone therapy, chemo is unlikely to result in a cure. This treatment is not expected to destroy all the cancer cells, but it may slow the cancer's growth and reduce symptoms, resulting in a better quality of life.

There are many different chemo drugs. Often 2 or more are given at the same time for better effect.

Side effects of chemo

While chemo drugs kill cancer cells, they also damage some normal cells and this can lead to side effects. The side effects of chemo depend on the type of drugs, the amount taken, and the length of treatment. They could include:

- Nausea and vomiting
- Loss of appetite
- Hair loss
- Mouth sores

Because normal cells are also damaged, you may have low blood cell counts. This can cause:

- Increased risk of infection (from a shortage of white blood cells)
- Bleeding or bruising after minor cuts or injuries (from a shortage of blood platelets)
- Tiredness (from low red blood cell counts)

Also, each drug may have its own unique side effects.

Most side effects go away once treatment is over. If you have problems with side effects, talk with your doctor or nurse about what can be done. There is help for many chemo side effects. For example, there are drugs to prevent or reduce nausea and vomiting. Other drugs can be given to boost blood cell counts.

Vaccine treatment

A prostate cancer vaccine, sipuleucel-T (Provenge[®]), has now been approved by the FDA to treat advanced prostate cancer. Unlike most vaccines, this vaccine is aimed at treating prostate cancer, not preventing it. Also, this vaccine is unique to each person who gets it - it is not mass produced.

For this vaccine, white blood cells are removed from the patient's blood and exposed to a protein from prostate cancer cells called *prostatic acid phosphatase* (PAP). These cells are then given back to the patient into a vein (IV). This process is done 2 more times, 2 weeks apart, so that the patient gets 3 doses of cells. In the body, the cells cause other immune system cells to attack the patient's prostate cancer.

Short-term side effects included fever, chills, fatigue, back and joint pain, nausea, and headache. A few men had more severe symptoms, including problems breathing and high blood pressure, which improved with treatment. Studies to see if this vaccine can help men with less advanced prostate cancer are going on.

Treating pain and other symptoms

Most of this article talks about ways to remove or destroy cancer cells or to slow their growth. But having a good quality of life is also an important goal. Be sure to talk to your doctor or nurse about pain or any symptoms that you have. There are ways to treat these. And getting good treatment can help you feel better and allow you to focus on things that are important in your life.

Pain medicines

Pain medicines work very well. When the drugs are being used as prescribed to treat cancer pain, you do not need to worry about addiction or dependence. You may have symptoms like tiredness and itching, but these usually go away after you get used to the medicine. Constipation and feeling sleepy are the most common problems, but there are things you can do to prevent these. Side effects can often be managed by changing the dosage or by adding other medicines.

Bisphosphonates

This is a group of drugs that can help relieve bone pain caused by cancer that has spread to the bones. They may also slow the growth of the cancer and strengthen bones in men who are getting hormone treatment.

Bisphosphonates can cause side effects, such as flu-like symptoms and bone pain. Some men have had a very rare, but distressing side effect from these drugs. They have pain in the jaw and their doctors find that part of the jaw bone has died. This can lead to loss of teeth or infections of the jaw bone. Doctors don't know why some people get these jaw problems or how to prevent them. They do seem to be more common after having a tooth pulled, so many cancer doctors recommend that patients have a dental check-up and have

any tooth or jaw problems treated before they start taking bisphosphonates. So far, the only treatment has been to stop the bisphosphonate treatment.

Denosumab

Denosumab (Xgeva™) is also a drug that can help when prostate cancer spreads to bone. When prostate cancer cells spread to the bones, they can turn on the cells that the body uses to break down bone (called osteoclasts). Denosumab blocks the osteoclasts from being turned on. Studies have shown that it can help prevent problems like broken bones in men with bone metastases.

This drug is given as a shot (injection) under the skin every 4 weeks. Men given this drug are often urged to take a supplement with calcium and vitamin D to prevent problems with low calcium levels. Like the bisphosphonates, denosumab can cause jaw problems, so doctors recommend taking the same measures (such as having tooth and jaw problems treated before starting the drug).

Steroids

Steroids can relieve bone pain and increase appetite for some men.

Radiation therapy

Radiation treatment can be used to treat bone pain caused by cancer that has spread to the bone.

Drugs called *radiopharmaceuticals* are also used for this purpose. This is a group of drugs that have radioactive elements. They are given into a vein. They settle in areas of bones that contain cancer and the radioactive part kills the cancer cells there. About 8 out of 10 prostate cancer patients with bone pain are helped by this treatment, at least for a while.. The main side effect is a lowering of blood cell counts. This could increase your risk of getting an infection or bleeding easily.

It is very important that you get good treatment for your pain. This will help you feel better and allow you to focus on the people and things that are most important to you. There are many ways to treat your pain, so be sure and tell all members of your prostate cancer care team about your symptoms.

Clinical trials

You may have had to make a lot of decisions since you've been told you have cancer. One of the most important decisions you will make is deciding which treatment is best for you. You may have heard about clinical trials being done for your type of cancer. Or maybe someone on your health care team has mentioned a clinical trial to you.

Clinical trials are carefully controlled research studies that are done with patients who volunteer for them. They are done to get a closer look at promising new treatments or procedures.

If you would like to take part in a clinical trial, you should start by asking your doctor if your clinic or hospital conducts clinical trials. You can also call our clinical trials matching service for a list of clinical trials that meet your medical needs. You can reach this service at 1-800-303-5691 or on our Web site at www.cancer.org/clinicaltrials. You can also get a list of current clinical trials by calling the National Cancer Institute's Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials Web site at www.cancer.gov/clinicaltrials.

There are requirements you must meet to take part in any clinical trial. If you do qualify for a clinical trial, it is up to you whether or not to enter (enroll in) it.

Clinical trials are one way to get state-of-the-art cancer treatment. They are the only way for doctors to learn better methods to treat cancer. Still, they are not right for everyone.

You can get a lot more information on clinical trials, in our document called *Clinical Trials: What You Need to Know*. You can read it on our Web site or call our toll-free number and have it sent to you.

Complementary and alternative therapies

When you have cancer you are likely to hear about ways to treat your cancer or relieve symptoms that your doctor hasn't mentioned. Everyone from friends and family to Internet groups and Web sites offer ideas for what might help you. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

What are complementary and alternative therapies?

It can be confusing because not everyone uses these terms the same way, and they are used to refer to many different methods. We use *complementary* to refer to treatments that are used *along with* your regular medical care. *Alternative* treatments are used *instead of* a doctor's medical treatment.

Complementary methods: Most complementary treatment methods are not offered as cures for cancer. Mainly, they are used to help you feel better. Some examples of methods that are used along with regular treatment are meditation to reduce stress, acupuncture to help relieve pain, or peppermint tea to relieve nausea. Some complementary methods are known to help, while others have not been tested. Some have been proven not to be helpful, and a few are even harmful.

Alternative treatments: Alternative treatments may be offered as cancer cures. These treatments have not been proven safe and effective in clinical trials. Some of these methods may be harmful, or have life-threatening side effects. But the biggest danger in most cases is that you may lose the chance to be helped by standard medical treatment. Delays or interruptions in your medical treatments may give the cancer more time to grow and make it less likely that treatment will help.

Finding out more

It is easy to see why people with cancer think about alternative methods. You want to do all you can to fight the cancer, and the idea of a treatment with no side effects sounds great. Sometimes medical treatments like chemotherapy can be hard to take, or they may no longer be working. But the truth is that most of these alternative methods have not been tested and proven to work in treating cancer.

As you think about your options, here are 3 important steps you can take:

- Look for "red flags" that suggest fraud. Does the method promise to cure all or most cancers? Are you told not to have regular medical treatments? Is the treatment a "secret" that requires you to visit certain providers or travel to another country?
- Talk to your doctor or nurse about any method you are thinking of using.
- Contact us at 1-800-227-2345 to learn more about complementary and alternative methods in general and to find out about the specific methods you are looking at.

The choice is yours

Decisions about how to treat or manage your cancer are yours to make. If you want to use a non-standard treatment, learn all you can about the method and talk to your doctor about it. With good information and the support of your health care team, you may be able to safely use the methods that can help you while avoiding those that could be harmful.

What is the best treatment for me?

If you have prostate cancer, you will want to think about a lot of things before you choose a course of treatment. These things include your age, your overall health, your goals for treatment, and your feelings about side effects. Some men, for example, can't imagine living with side effects such as incontinence or impotence. Others are less concerned about these and more focused on getting rid of the cancer.

If you are over 70 or have serious health problems, you might want to think of prostate cancer as a chronic disease. It will most likely not lead to your death. But it could cause symptoms you want to avoid. In this view, the goal is to relieve symptoms and avoid side effects of treatment. So you might decide to choose active surveillance (careful follow-up with your doctor) or hormone treatment. Of course, age itself is not the best basis on which to make your choice. Many men are in good mental and physical shape at age 70, while some younger men may not be as healthy.

If you are younger and otherwise healthy, you might be more willing to put up with the side effects of treatment if they offer you the best chance for cure. Most doctors now feel that external radiation, radical prostatectomy, and radioactive implants have the same cure rates for the earliest stage prostate cancers. But each man's case is unique and involves many factors.

These decisions are even harder for you if you try to make them alone. It is often helpful to discuss treatment options with more than one doctor. It's natural for surgical specialists, such as urologists, to recommend surgery, and for radiation oncologists to recommend radiation. You may want to consider getting more than one medical opinion, maybe even from different types of doctors. Your primary care doctor can often help you sort out which treatment plan is best for you.

Many men find it helps to talk to others who have faced the same issues. The American Cancer Society's Man to Man program (or programs like this offered by other organizations) offers a way for men to meet and talk about issues related to prostate cancer. To learn more about Man to Man, please call our toll-free number or visit our Web site.

What are some questions I can ask my doctor?

As you cope with cancer and cancer treatment, we encourage you to have honest, open talks with your doctor. Feel free to ask any question that's on your mind, no matter how small it might seem. Here are some questions you might want to ask. Be sure to add your own questions as you think of them. Nurses, social workers, and other members of the treatment team may also be able to answer many of your questions.

- Would you please write down the exact type of cancer I have?
- May I have a copy of my pathology report?
- What is the chance that the cancer has spread beyond my prostate? If so, is it still curable?
- What other tests (if any) do you think I need and why?
- What is the clinical stage and Gleason score of my cancer? What do those mean in my case? Does this make me a low risk, intermediate risk or high risk patient?
- Is watchful waiting (active surveillance) an option for me? Why or why not?
- Do I need a radical prostatectomy or radiation? Why or why not?
- If I need a radical prostatectomy, will it be nerve sparing? Will it be laparoscopic?
- What type of radiation treatment might be best for me?
- What other treatments might be right for me? Why?
- Among those treatments, what are the risks or side effects I should expect?
- What are the chances that I will have problems with incontinence or impotence?
- What are the chances that I will have other urinary or rectal problems?

- What are the chances of the cancer coming back with the treatment you suggest? What would be our next step if this happened?
- What is my expected survival rate based on clinical stage, grade, and various treatment options?
- Should I follow a special diet?
- Is there another kind of doctor I should see?

Add your own questions below:

Moving on after treatment

It can feel good to be done with treatment, but it can also be stressful. You may find that you now worry about the cancer coming back. This is a very common concern among those who have had cancer. (When cancer comes back, it is called a *recurrence*.)

It may take a while before your recovery begins to feel real and your fears are somewhat relieved. You can learn more about what to look for and how to learn to live with the chance of cancer coming back in *Living With Uncertainty: The Fear of Cancer Recurrence*.

Follow-up care

When treatment ends, your doctors will still want to watch you closely. It is very important to go to all of your follow-up visits. During these visits, your doctors will ask questions about any problems you may have and may do exams and lab tests or x-rays and scans to look for signs of cancer or treatment side effects. This is a good time for you to ask any questions and discuss any concerns you might have.

Your doctor should give you a follow-up plan. This plan usually includes regular doctor visits, PSA blood tests, and digital rectal exams, which will likely begin within a few months after you finish treatment. Most doctors recommend PSA tests about every 3-6 months for the first 5 years after treatment, and at least yearly after that. Bone scans or other imaging tests may also be done, depending on your own case.

Almost any cancer treatment can have side effects. Some may last for a few weeks or months, but others can be permanent. Please tell your cancer care team about any symptoms or side effects that bother you so they can help you manage them.

Prostate cancer can come back (recur) many years after initial treatment. This is why it is important to keep regular doctor visits and report any new symptoms, such as bone pain or problems with urination. Should your prostate cancer come back, your treatment

options will depend on where it is thought to be located and what types of treatment you've already had.

It is also important to keep health insurance. While you hope your cancer won't come back, it could happen. If it does, you don't want to have to worry about paying for treatment. Should your cancer come back, our document *When Your Cancer Comes Back: Cancer Recurrence* helps you manage and cope with this phase of your treatment.

Seeing a new doctor

At some point after your cancer is found and treated, you may find yourself in the office of a new doctor. It is important that you be able to give your new doctor the exact details of your diagnosis and treatment. Make sure you have this information handy and always keep copies for yourself:

- A copy of your pathology report from any biopsy or surgery
- If you had surgery, a copy of your operative report
- If you were in the hospital, a copy of the discharge summary that the doctor wrote when you were sent home from the hospital
- If you had radiation treatment, a summary of the type and dose of radiation and when and where it was given
- If you had chemo or targeted therapies, a list of your drugs, drug doses, and when you took them

Changes to think about during and after treatment

Having cancer and dealing with treatment can take a lot of time and energy, but it can also be a time to look at your life in new ways. Maybe you are thinking about how to improve your health over the long term.

Make healthier choices

Think about your life before you learned you had cancer. Were there things you did that might have made you less healthy? Maybe you drank too much alcohol, ate more than you needed, used tobacco, or didn't exercise very often.

Now is not the time to feel guilty or blame yourself. You can start making changes today that can have positive effects for the rest of your life. Not only will you feel better but you will also be healthier.

You can start by working on those things that worry you most. Get help with those that are harder for you. For instance, if you are thinking about quitting smoking and need help, call us at 1-800-227-2345.

Eating better

Eating right is hard for many people, but it can be even harder to do during and after cancer treatment. If you are still in treatment and are having eating problems related to your treatment, please call us for a copy of *Nutrition for the Person With Cancer During Treatment*. We also have *Nutrition and Physical Activity During and After Cancer Treatment: Answers to Common Questions*.

One of the best things you can do after treatment is to put healthy eating habits into place. You may be surprised at the long-term benefits of some simple changes. Try to eat 5 or more servings of vegetables and fruits each day. Choose whole-grain foods instead of white flour and sugars. Try to limit meats that are high in fat. Cut back on processed meats like hot dogs, bologna, and bacon. If you drink alcohol, limit yourself to one or 2 drinks a day at the most. And don't forget to get some type of regular exercise. A good diet along with regular exercise will help you stay at a healthy weight and give you more energy.

Fatigue and exercise

Feeling tired (fatigue) is a very common problem during and after cancer treatment. This is not a normal type of tiredness but a "bone-weary" exhaustion that doesn't get better with rest. For some people, fatigue lasts a long time after treatment and can keep them from staying active. But exercise can actually help reduce fatigue and the sense of depression that sometimes comes with feeling so tired.

If you are very tired, though, you will need to balance activity with rest. It is OK to rest when you need to. To learn more about fatigue, please see our document, *Fatigue in People With Cancer*.

If you were very ill or weren't able to do much during treatment, it is normal that your fitness, staying power, and muscle strength declined. You need to find an exercise plan that fits your own needs. Talk with your health care team before starting. Get their input on your exercise plans. Then try to get an exercise buddy so that you're not doing it alone.

Exercise can improve your physical and emotional health.

- It improves your cardiovascular (heart and circulation) fitness.
- It makes your muscles stronger.
- It reduces fatigue.
- It lowers anxiety and depression.
- It makes you feel generally happier.
- It helps you feel better about yourself.

Long term, we know that exercise plays a role in preventing some cancers. The American Cancer Society recommends that adults be physically active for at least 30 minutes a day on 5 or more days of the week.

How about your emotional health?

Once your treatment ends, you may be surprised by the flood of emotions you go through. This happens to a lot of people. You may find that you think about the effect of your cancer on things like your family, friends, and career. Money may be a concern as the medical bills pile up. Or you may begin to think about the changes that cancer has brought to your relationship with your spouse or partner. Unexpected issues may also cause concern -- for instance, as you get better and need fewer doctor visits, you will see your health care team less often. This can be hard for some people.

This is a good time to look for emotional and social support. You need people you can turn to. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support communities, or private counselors.

The cancer journey can feel very lonely. You don't need to go it alone. Your friends and family may feel shut out if you decide not include them. Let them in -- and let in anyone else who you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345 and we can put you in touch with a group or resource that may work for you.

You can't change the fact that you have had cancer. What you can change is how you live the rest of your life -- making healthy choices and helping your body and mind feel well.

If treatment stops working

When a person has had many different treatments and the cancer has not been cured, over time the cancer tends to resist all treatment. At this time you may have to weigh the possible benefits of a new treatment against the downsides, like treatment side effects and clinic visits.

This is likely to be the hardest time in your battle with cancer -- when you have tried everything within reason and it's just not working anymore. Your doctor may offer you new treatment, but you will need to talk about whether the treatment is likely to improve your health or change your outlook for survival.

No matter what you decide to do, it is important for you to feel as good as possible. Make sure you are asking for and getting treatment for pain, nausea, or any other problems you may have. This type of treatment is called "palliative" treatment. It helps relieve symptoms but is not meant to cure the cancer.

At some point you may want to think about hospice care. Most of the time it can be given at home. Your cancer may be causing symptoms or problems that need to be treated. Hospice focuses on your comfort. You should know that having hospice care doesn't mean you can't have treatment for the problems caused by your cancer or other

health issues. It just means that the purpose of your care is to help you live life as fully as possible and to feel as well as you can.

You can learn more about this in our documents, *When Your Cancer Comes Back: Cancer Recurrence, Advanced Cancer, and Hospice Care*.

What's new in prostate cancer research?

Research into the causes, prevention, and treatment of prostate is being done in many medical centers around the world.

Genetics

New research on genes linked to prostate cancer helps scientists better understand how prostate cancer grows. Tests to find abnormal prostate cancer genes could also help tell which men are at high risk. They could then be tested more often. Further research could provide answers about the chemical changes that lead to prostate cancer. This may make it possible to design drugs to reverse those changes.

One of the biggest problems now facing doctors and their patients with prostate cancer is figuring out which cancers are more likely to spread. Knowing this could help decide which men need treatment and which could be better served by watchful waiting. Researchers are now trying to find genetic clues about which cancers are more likely to grow fast and spread.

Prevention

Researchers continue to look for foods that affect prostate cancer risk. Scientists have found some substances in tomatoes and soybeans that may help to prevent prostate cancer. They are trying to develop related compounds that are even more powerful and might be taken as supplements. So far, most research suggests that a balanced diet that includes these foods as well as other fruits and vegetables is better than taking these substances as supplements.

Some studies have suggested that certain vitamins and minerals could lower prostate cancer risk. But a large study of this issue, called the Selenium and Vitamin E Cancer Prevention Trial (SELECT), found that neither vitamin E nor selenium supplements lowered prostate cancer risk after daily use for about 5 years.

Other recent studies have found that men with high levels of vitamin D seem to have a lower risk of getting the more lethal forms of prostate cancer. Overall though, studies have not found that vitamin D protects against prostate cancer.

Although many people believe that vitamins are natural and cause no harm, recent research has shown that high doses may be harmful. One study found that men who take more than 7 multivitamin tablets per week may have a higher risk of getting advanced prostate cancer.

Finding prostate cancer early

Doctors agree that the PSA blood test is not a perfect test for finding prostate cancer early. It misses some cancers, and in other cases the PSA can be high when there isn't any cancer. Researchers are working on ways to address this problem. While early results have been promising, new tests are not yet available outside of research labs and will need more study before they are widely used to test for prostate cancer.

Diagnosis

Doctors doing prostate biopsies often use transrectal ultrasound (TRUS), which uses sound waves to create black and white pictures of the prostate. But standard ultrasound may not find some areas containing cancer. A newer method, known as *color Doppler ultrasound* may make prostate biopsies more accurate by helping to ensure the right part of the gland is sampled. But more studies are needed before its use becomes common. At this time, this test is only available as a part of a clinical trial.

Staging

Staging plays a key role in figuring out which treatment choices are best for a man. But scans such as CT and MRI can't find all cancers, especially cancer in lymph nodes. A new type of enhanced MRI might help find lymph nodes that contain cancer and make staging easier. Early results of this method look good, but it needs more study before it becomes widely used.

Treatment

This is a very active area of research. Newer treatments are being developed, and current treatment methods are being improved.

Surgery: If the nerves that control erections must be removed during surgery, a man will become impotent. Some doctors are looking at how to repair these nerves with grafts of small nerves taken from other parts of the body or something artificial. This is still experimental and not all doctors think it is useful. Further studies are going on.

Radiation treatment: Better technology is making it possible to aim radiation more precisely than in the past. This makes it possible to treat only the prostate gland and any cancer just outside the gland. Studies are going on to find out which techniques are best for which patients.

New computer programs allow doctors to better plan the radiation doses and approaches for both external radiation therapy and brachytherapy.

Newer treatments for early cancer: Researchers are now studying newer forms of treatment for early stage prostate cancer, either as the first treatment or as treatment after unsuccessful radiation treatment.

One promising treatment, known as *high-intensity focused ultrasound (HIFU)*, destroys cancer cells by heating them with highly focused ultrasonic beams. While it has been used more in Europe, it is not commonly used in the United States at this time. Studies are now going on to find out if it is safe and effective.

Nutrition and lifestyle changes: A recent study found that in men with a rising PSA after surgery or radiation therapy, drinking pomegranate juice seemed to slow the time it took the PSA level to double. Larger studies are now being done to try to confirm these results.

Some encouraging early results have also been reported with flaxseed supplements which seemed to slow the rate at which prostate cancer cells multiplied. More research is needed to confirm this finding.

A recent report found that men who chose not to have treatment for their localized prostate cancer may be able to slow its growth with major lifestyle changes. The men ate a vegan (no meat, fish, eggs, or dairy products) diet and exercised a lot. They also went to support groups and yoga. After 1 year the men saw a slight drop in their PSA level. It isn't known whether this effect will last since the report only followed the men for 1 year. Also, some men may find these changes hard to follow.

Hormone treatment: Even though LHRH agonists stop the testicles from making testosterone, the body can still make a small amount of androgens. A new drug (abiraterone) blocks an enzyme which is needed for the body to make many hormones, including androgens. This drug has been studied in men whose cancers were growing despite low testosterone levels (from other treatments) and who had already been treated with the chemo drug docetaxel (Taxotere). Abiraterone lowered levels of androgens even more. It also shrank tumors, lowered PSA levels, and helped the men live longer. There were few side effects. Because of these results, the FDA has approved abiraterone for use in this country. This drug is taken as a pill every day. Because abiraterone lowers the level of certain other hormones in the body, prednisone (a cortisone-like drug) needs to be taken as well during treatment.

Chemotherapy: New chemo drugs and combinations of drugs are being studied. Some (such as docetaxel and cabazitaxel) have been shown to help men live longer.

Prostate cancer vaccines: Vaccines that boost the body's immune response to prostate cancer cells are being tested in clinical trials. One vaccine has been approved and is available now. Unlike vaccines against infections like measles or mumps, these vaccines are designed to help treat, not prevent, prostate cancer.

Blood vessel growth: In order for cancers to grow, blood vessels must grow to nourish the cancer cells. This process is called *angiogenesis*. New drugs (and other drugs that are already used to treat different types of cancer) that may be useful in stopping the growth of these blood vessels are being studied. Several of these drugs are now being tested in clinical trials.

Bone pain: Doctors are looking at a new way to treat bone pain called *RFA* (*radiofrequency ablation*). RFA has been used for many years to treat tumors in other

organs such as the liver. Its use for bone pain is still fairly new, but early results are promising.

How can I learn more?

From your American Cancer Society

The following information may also be helpful to you. These materials may be ordered from our toll-free number.

Caring for the Patient with Cancer at Home: A Guide for Patients and Families (also available in Spanish)

American Cancer Society Guidelines for the Early Detection of Cancer (also available in Spanish)

Managing Incontinence after Treatment for Prostate Cancer

Sex and Men With Cancer

Sexuality for the Man With Cancer (also available in Spanish)

Understanding Chemotherapy: A Guide for Patients and Families (also available in Spanish)

Understanding Radiation Therapy: A Guide for Patients and Families (also available in Spanish)

The following books are available from the American Cancer Society. Call us to ask about costs or to place your order.

American Cancer Society Complete Guide to Prostate Cancer

American Cancer Society's Guide to Pain Control: Understanding and Managing Cancer Pain

Cancer in the Family: Helping Children Cope With a Parent's Illness

Caregiving: A Step-by-Step Approach for Caring for the Person with Cancer at Home

National organizations and Web sites*

Along with the American Cancer Society, other sources of information and support include:

American Urological Association (AUA)

Toll-free number: 1-866-746-4282 (1-866-RING-AUA)

Web site: www.urologyhealth.org

National Association for Continence

Toll-free number: 1-800-252-3337 (1-800-BLADDER)

Web site: www.nafc.org

National Cancer Institute

Toll-free number: 1-800-4-CANCER (1-800-422-6237)

Web site: www.cancer.gov

National Coalition for Cancer Survivorship

Toll-free number: 1-888-650-9127

1-877-622-7937 (1-877-NCCS-YES) for some publications and Cancer Survivor

Toolbox[®] orders

Web site: www.canceradvocacy.org

ZERO - The Project to End Prostate Cancer (formerly National Prostate Cancer Coalition)

Toll-free number: 1-888-245-9455

Web site: www.zerocancer.org

Prostate Cancer Foundation (formerly "CaPCURE")

Toll-free number: 1-800-757-2873 (1-800-757-CURE)

Web site: www.pcf.org

Us TOO International, Inc.

Toll-free number: 1-800-808-7866 (1-800-80US TOO) or 1-630-795-1002 (Chicago area)

Web site: www.ustoo.org

**Inclusion on this list does not imply endorsement by the American Cancer Society*

No matter who you are, we can help. Contact us anytime, day or night, for information and support. Call us at **1-800-227-2345** or visit www.cancer.org.

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For additional assistance please contact your American Cancer Society
1 · 800 · ACS-2345 or www.cancer.org