



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

### What is cancer?

The body is made up of trillions 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?

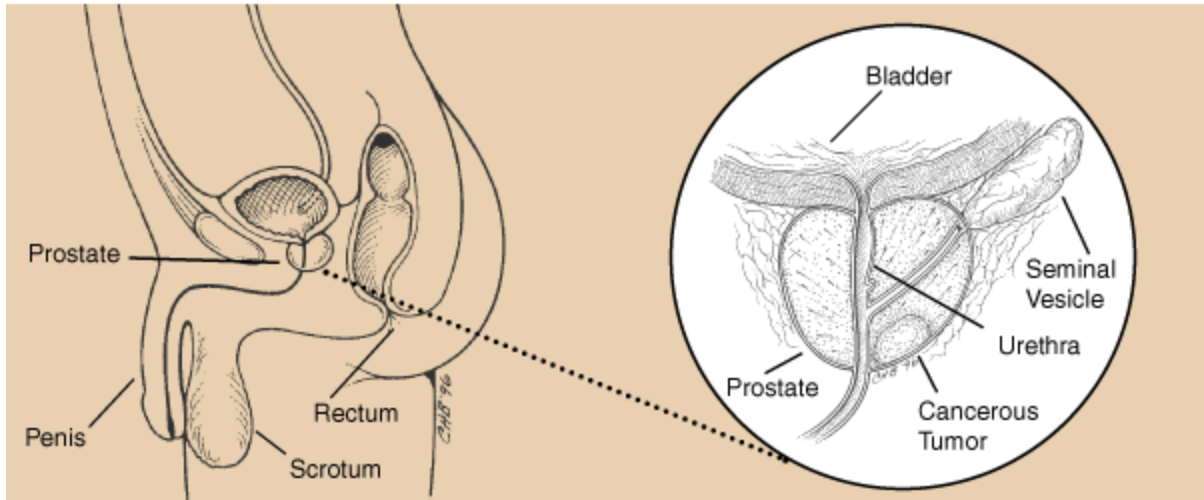
### The prostate

The prostate is a gland found only in males. 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 about 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 becomes an adult. Male hormones (called androgens) such as testosterone cause this growth. The prostate usually stays at about the same size or grows slowly in adults, as long as male hormones are present.

### Benign prostatic hyperplasia

The inner part of the prostate around the urethra may keep on growing as men get older. This causes *BPH* (*benign prostatic hyperplasia*) which can lead to problems passing urine because the prostate can press on the urethra. BPH is *not* cancer and does not change into cancer. But it can be a real medical problem for some men. If it needs treatment, medicines can often be used to shrink the size of the prostate or to relax the muscles in it, which usually helps with urine flow. If medicines aren't helpful, some type of surgery, such as a transurethral resection of the prostate (TURP) may be needed. (See the "Surgery for prostate cancer" section for a description of this procedure.)



## 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. In many cases neither they nor their doctors even knew they had it.

## Possible pre-cancerous changes of the prostate

Some doctors believe that prostate cancer starts out with very small changes in the size and shape of the prostate gland cells, although this is not known for sure.

### **Prostatic intraepithelial neoplasia (PIN)**

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). Almost half of all men have PIN by the time they reach age 50.

The importance of low-grade PIN to prostate cancer is not clear. If low-grade PIN is found on a prostate biopsy, the follow-up for patients is most often the same as if nothing abnormal was seen.

If high-grade PIN has been found on your prostate biopsy, there is about a 20% to 30% chance that you also have cancer in another place in your prostate. This is why doctors often watch men with high-grade PIN carefully and may advise them to have a repeat prostate biopsy, especially if the first biopsy did not take samples from all parts of the prostate.

## **Proliferative inflammatory atrophy (PIA)**

This is another finding that may be noted on a prostate biopsy. In PIA, the prostate cells look smaller than normal, and there are signs of inflammation in the area. PIA is not cancer, but researchers believe that PIA may sometimes lead to high-grade PIN, or perhaps to prostate cancer.

## **How many men get prostate cancer?**

The American Cancer Society's most recent estimates for prostate cancer in the United States are for 2012:

- About 241,740 new cases of prostate cancer
- About 28,170 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.

Prostate cancer can be a serious disease, but most men found to have prostate cancer do not die from it. In fact, more than 2.5 million men in the United States who have had prostate cancer at some point are still alive today.

## **What are the risk factors for prostate cancer?**

On a basic level, 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. We often look like our parents because they are the source of our DNA. But DNA affects more than how we look. A small percentage (about 5% to 10%) of prostate cancers are linked to inherited DNA 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 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

Most DNA changes related to prostate cancer seem to happen during a man's life rather than having been inherited. 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 changes (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) such as testosterone may play a part in prostate cancer risk in some men. Some studies have found 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.

## Risk factors for prostate cancer

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 changed. 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 few or no known risk factors. For some of these factors, the link to prostate cancer risk is not yet clear.

**Age:** Prostate cancer is very rare in men younger than 40. 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:** 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. (The risk

is higher for men who have a brother with the disease than for those with an affected father.)

**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.

Some studies have found that men who consume a lot of calcium or dairy foods may have a higher risk of advanced prostate cancer. But most studies have not found this link with the levels of calcium found in the average diet.

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

**Smoking:** Most studies have not found a link between smoking and the risk of getting prostate cancer. A recent study linked smoking to a possible small increase in the risk of death from prostate cancer, but this is a new finding that 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, there are some things you can do that might lower your risk of prostate cancer.

### Body weight, physical activity, and diet

The effects of body weight, exercise, and diet on prostate cancer risk are not clear, but there may be things you can do that might lower your risk.

Some studies have found that men who are overweight may have a slightly lower risk of prostate cancer overall, but a higher risk of prostate cancers that are likely to be fatal.

Studies have found that men who get regular exercise have a slightly lower risk of prostate cancer. Vigorous activity may have a greater effect, especially on the risk of advanced prostate cancer.

Several studies have suggested that diets high in certain vegetables (including tomatoes, cruciferous vegetables, soy, beans, and other legumes) or fish may be linked with a lower risk of prostate cancer, especially more advanced cancers. Cruciferous vegetables include cabbage, broccoli, and cauliflower.

For now, the best advice about diet and activity to possibly reduce the risk of prostate cancer is to:

- Eat at least 2½ cups of a wide variety of vegetables and fruits each day.
- Be physically active.
- Stay at a healthy weight.

It may also make sense to limit calcium supplements and to not get too much calcium in the diet.

For more information, see our document, *American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention*.

## Vitamin, mineral, and other supplements

Some earlier studies suggested that taking supplements of vitamin E or the mineral selenium might lower prostate cancer risk. But in a large study (known as SELECT), neither vitamin E nor selenium was found to lower prostate cancer risk. In fact, men taking the vitamin E supplements were later found to have a slightly higher risk of prostate cancer.

Several studies are now looking at the possible effects of soy proteins (called isoflavones) on prostate cancer risk. The results of these studies are not yet available.

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

## Medicine

Large studies have looked at 2 drugs used to treat benign prostatic hyperplasia (BPH), finasteride (Proscar<sup>®</sup>) and dutasteride (Avodart<sup>®</sup>), to see if they might also help lower prostate cancer risk. In these studies, men taking either drug were less likely to develop prostate cancer after several years than men getting a placebo.

But in men who took these drugs, there were more cases of prostate cancer that looked like they might grow and spread quickly. Researchers are still watching the men in these studies to see if this had an effect on how long the men live.

These drugs can cause sexual side effects like lowered sexual desire and impotence. But they can help with urinary problems such as trouble urinating and leaking urine (incontinence). At this time it's not clear whether taking these drugs to lower the risk of prostate cancer is a good idea or not. Men who want to know more about this should discuss it with their doctors.

Other drugs that may help prevent prostate cancer are now being tested in clinical trials. So far, no other supplement or drug has been found to be helpful in studies large enough to allow experts to recommend 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 a man's blood. Another way prostate cancer is found early is when the doctor does a *digital rectal exam (DRE)*. If prostate cancer is found as a result of either one of these tests, it has probably been found at an early, more treatable stage.

Since about 1990 it has become fairly common for men in the United States 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 if it might be caused by something else, like better treatments.

There is no question that screening can help find many prostate cancers early, but these tests are not perfect. These tests can sometimes have abnormal results even when a man does not have cancer, or they can have normal results even when a man does have cancer. Uncertain or false test results could cause confusion and worry.

Even if these tests find cancer, they 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 may never have led to their deaths or even caused any problems. Often these men are 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 knowing he has cancer and not having treatment. These treatments can lead to urinary or bowel problems or problems with sex. Doctors and patients are still trying 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 should 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 more than one close family member [father, brothers, sons] who had prostate cancer at an early age).

After this discussion, men who want to be screened should be tested with the PSA blood test. The digital rectal exam (DRE) may also be done as a part of screening.

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.

If no prostate cancer is found as a result of screening, the time between future screenings depends on the results of the PSA blood test:

- Men 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 often grows slowly, 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.

## 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, such as:

- **An enlarged prostate** like BPH (benign prostatic hyperplasia– not cancer), which many men get as they grow older

- **Older age**
- **Infection or inflammation** of the prostate gland (prostatitis)
- **Ejaculation** (may raise PSA for a short time)
- **Riding a bicycle** (but not all studies have found this)
- **Certain urology tests**
- **Certain medicines**, such as testosterone

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

- **Certain medicines:** Some drugs used to treat BPH or urinary symptoms may lower PSA levels. You should tell your doctor if you are taking medicines for these problems, because the doctor will need to adjust the reading.
- **Herbal mixtures:** Some 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 may have lower PSA levels. This effect may be greater in non-smokers. More research is needed to confirm this. If you take aspirin regularly (such as to help prevent heart disease), talk to your doctor before you stop taking it for any reason.

## Newer types of PSA tests

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.

## Other uses of the PSA blood test

The PSA test is used mainly to detect prostate cancer early, but it is also useful if prostate cancer has already been found (see below).

## DRE (digital rectal exam)

To do the DRE, the doctor puts a gloved, lubricated finger into the rectum to feel for any bumps or hard areas on the prostate 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 felt by rectal exam. The exam can be uncomfortable (especially in men with hemorrhoids), but it usually isn't painful and takes only a short time.

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.

## 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).

Other possible 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.

## Medical history and physical exam

If your doctor suspects you might have prostate cancer, he or she will ask you about any symptoms you are having, such as any urinary or sexual problems, and how long you have had them. Your doctor may also ask about bone pain, which could be a sign that the cancer might have spread to your bones.

Your doctor will also do a physical exam and will check other parts of your body to see if the cancer has spread.

## PSA blood test

The prostate-specific antigen (PSA) blood test is used mainly to try to find prostate cancer early in men without symptoms (see above). But it is also one of the first tests done in men who have symptoms that might be caused by prostate cancer.

The PSA test can also be useful if prostate cancer has already been found.

- It can be used along with physical exam results and tumor grade (from the biopsy, described further on) to help decide if other tests (such as CT scans or bone scans) are needed.
- It can help tell if your cancer is still confined to the prostate gland. This may affect your treatment options.

- 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.

## Prostate biopsy

If certain symptoms or the results of tests like the PSA blood test and/or DRE suggest that you might have prostate cancer, your doctor will do a prostate biopsy to find out.

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, hollow needle through the wall of the rectum into the prostate gland. When the needle is pulled out, it takes out a small piece of prostate tissue (called a *core*). 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.

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, blood in your 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" result. 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.

## **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 core 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)
- Sometimes when the prostate cells are seen under the microscope, they don't look like cancer, but they're not quite normal, either. These results are often reported as suspicious. Your doctor can explain what these results might mean in your case.

## **Imaging tests**

Not all men with prostate cancer need to have more tests, but for those who do, the tests below are sometimes used. Imaging tests use x-rays, magnetic fields, sound waves, or radioactive substances to create pictures of the inside of your body. The imaging tests used most often for prostate cancer include:

### **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 often takes less than 10 minutes. The TRUS probe is about the width of a finger and is lubricated before it is placed in your rectum. You will feel some pressure when it is put in, 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).

## **Bone scan**

If prostate cancer spreads to distant places, it often goes to the bones first. (Even when this happens, it is still 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. The radioactive substance is drawn to damaged areas of bone 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 (also known as a *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 few people are allergic and get hives. Rarely, more serious problems, like trouble breathing or low blood pressure, can occur. Be sure to tell your doctor if you have any allergies or have ever had trouble with any contrast material used for x-rays.

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 sometimes 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 it uses radio waves and strong magnets 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 other nearby structures. 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.

## **ProstaScint™ 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.

This test can find the spread of prostate cancer to lymph nodes and other organs, although it is not as helpful for looking at the area around the prostate itself. 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. In some cases, the lymph nodes are looked at 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 might 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, 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 lymph nodes near the prostate 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.

## **Staging of prostate cancer**

*Staging* is the process of finding out the extent of the cancer. It is very important because your treatment and the outlook for your recovery depend on the stage of your cancer.

The stage is based on the prostate biopsy results (including the Gleason score), the PSA level, and any other exams or tests that were done to find out how far the cancer has spread. These tests are described in the section, "How is prostate cancer found?"

## **Putting it all together to get the stage of the cancer**

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.

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.

## **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.

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, biopsy, and any other tests you have had.

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.

# 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. If you would rather not read the survival rates, skip to the next section.

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.

According to the most recent data, when including *all* men with prostate cancer:

- The relative 5-year survival rate is nearly 100%
- The relative 10-year survival rate is 98%
- The 15-year relative survival rate is 91%

## Survival rates by stage

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. About 4 out of 5 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	nearly 100%
regional	nearly 100%
distant	29%

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 prostate cancer 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. Depending on each person's case, the treatment options for men with prostate cancer may include:

- Expectant management (watchful waiting) or active surveillance
- Surgery
- Radiation treatment
- Cryosurgery (cryotherapy)
- Hormone therapy
- Chemotherapy
- Vaccine treatment

These treatments are most often used one at a time, although in some cases they may be combined.

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

Many men may find it helpful to get a second opinion, especially if there are 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.

The main types of doctors who treat prostate cancer include:

- Urologists: surgeons who are expert in treating diseases of the urinary system and male reproductive system (including the prostate)
- Radiation oncologists: doctors who treat cancer with radiation
- Medical oncologists: doctors who treat cancer with medicines such as chemotherapy or hormone therapy

It is important to discuss all of your treatment options, including goals and possible side effects, with your doctors to help you choose the treatment that best fits your needs.

The next few sections describe the types of treatments used for prostate cancer.

## Expectant management (watchful waiting) and active surveillance for prostate cancer

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.

Some doctors use these terms to mean the same thing. For other doctors the terms mean something slightly different:

*Active surveillance* is often used to mean watching the cancer closely with PSA blood tests, digital rectal exams (DREs), and ultrasounds at regular intervals to see if the cancer is growing. Prostate biopsies may be done as well to see if the cancer is starting to grow faster. If there is a change in your test results, your doctor would then talk to you about treatment options.

*Watchful waiting* is sometimes used to describe a less intensive type of follow-up that may mean fewer tests and relying more on changes in a man's symptoms to decide if treatment is needed.

Not all doctors agree with these definitions or use them exactly this way. In fact, some doctors prefer to no longer use the term watchful waiting because it implies that nothing is being done, when in fact a man is still being closely followed. **No matter which term**

**your doctor may use, it is very important to understand exactly what he or she means when they refer to it.**

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 if things change. Still, some early studies have shown that men who choose active surveillance and later go on to be treated tend to 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 the prostate. It is less often a choice if you are young, healthy, and have a cancer that is growing fast.

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

## Surgery for prostate cancer

Surgery is a common choice to try to cure prostate cancer if it is not thought to have spread outside the gland.

The main type of surgery for prostate cancer is known as a *radical prostatectomy*. In this operation, the surgeon removes the entire prostate gland plus some of the tissue around it, including the seminal vesicles. A radical prostatectomy can be done in different ways.

### Open approaches to prostatectomy

In the more traditional approach to doing a prostatectomy, the surgeon operates through a single long incision to remove the prostate and nearby tissues. This is sometimes referred to as an *open* approach.

**Radical retropubic prostatectomy:** For this approach, a 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).

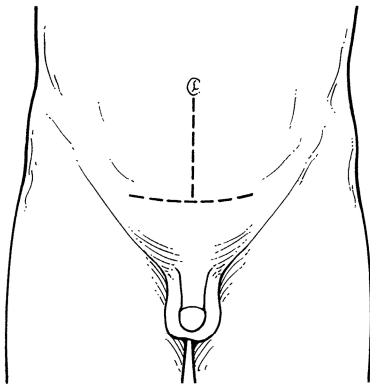
Your doctor may first remove lymph nodes near the prostate and have them looked at under a microscope. If any of the nodes contain cancer, it means the cancer has spread. Since the cancer probably can't be cured by taking out the prostate, the doctor might stop the operation.

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.

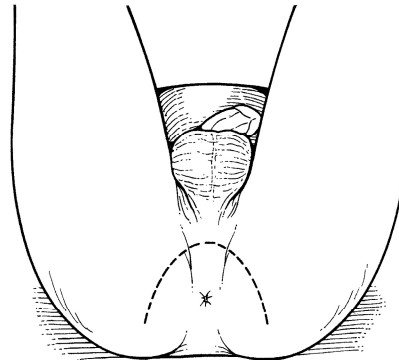
After the surgery, while you are still under anesthesia, a small tube (catheter) will be put in your penis to help drain your bladder. The catheter usually stays in place for 1 to 2 weeks while you are healing. You will be able to urinate on your own after the tube is removed.

You will probably stay in the hospital for a few days after the surgery and be limited in your activities for about 3 to 5 weeks. The possible side effects of prostatectomy are described below.

**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

The perineal approach often takes less time than the retropubic approach, and may result in less pain.

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.

You will probably stay in the hospital for a few days after the surgery and be limited in your activities for about 3 to 5 weeks. The possible side effects of prostatectomy are described below.

## **Laparoscopic approaches to prostatectomy**

Laparoscopic approaches use several smaller incisions and special surgical tools to remove the prostate. This can be done with the surgeon either holding the tools directly, or using a control panel to precisely move robotic arms that hold the tools.

**Laparoscopic radical prostatectomy (LRP):** For an LRP, the surgeon makes several small cuts, through which special long surgery tools are inserted to remove the prostate. One of the tools has a small video camera on the end, which lets the surgeon see inside the abdomen.

LRP has advantages over the open approach: less blood loss and pain, a shorter hospital stay, and faster recovery time. Nerve-sparing is possible with LRP. 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 (RALRP):** A 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 surgery through several small cuts in the patient's belly (abdomen).

Like direct LRP, RALRP has advantages over the open approach in terms of pain, blood loss, and recovery time. So far though, there is little difference between direct LRP and RALRP for the patient.

In terms of the side effects men are most concerned about, such as urinary or sexual problems (described below), there does not seem to be a difference between RALRP and other approaches to prostatectomy.

Robotic LRP has been in use in the United States since 2003. Because this is still a fairly new way of doing the surgery, reports of long-term outcomes are not yet available. Still, this approach has become more popular in recent years, and is now the most common way to do a prostatectomy.

No matter which type of surgery you choose, 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.

## **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.

If lymph nodes are removed, a collection of lymph fluid (called a *lymphocele*) can form and may need to be drained.

Because there are many blood vessels near the prostate gland, there is a risk of bleeding during and after the surgery. Rarely, part of the intestine might be cut during surgery, which could lead to infections and might need more surgery to correct.

### **Side effects**

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 occur with other forms of treatment for prostate cancer, although they are described here in more detail.

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

There are 3 main 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 (erectile dysfunction):** 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.

Your ability to have an erection after surgery depends on your age, your ability to get an erection before the operation, and whether the nerves were cut. Most men can expect some decrease in the ability to have an erection, but the younger you are, the less likely you are to have problems. Each man's situation is different, so ask your doctor about his or her success rates and what the outcome is likely to be in your particular case.

If erections return after surgery, this often occurs slowly. In fact, it can take up to 2 years. During the first few months, you may need to use medicines or other treatments to help.

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:** 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.

**Loss of fertility:** 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, you might talk to your doctor about "banking" your sperm before the operation.

**Lymphedema:** A 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. This is most likely caused by shortening of the urethra when a portion of it is removed along with the prostate.

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

## **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 prostate cancer. The same operation is used even more often to relieve symptoms of non-cancerous prostate swelling called BPH.

During this operation, the surgeon removes the inner part of the prostate that surrounds the urethra. The skin is not cut with this surgery. An instrument called a *resectoscope* is passed through the end of the penis into the urethra to the level of the prostate. Once it is

in place, either electricity is passed through a wire to heat it or a laser is used to cut or destroy the tissue. 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. 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. You can usually leave the hospital after 1 to 2 days and go back to work in 1 to 2 weeks.

## Radiation therapy for prostate cancer

Radiation therapy is treatment with high-energy rays (such as x-rays) to kill cancer cells or shrink tumors. It may be used:

- As the first treatment for low-grade cancer that is still confined within the prostate gland. Cure rates for men with these types of cancers are about the same as those for men getting radical prostatectomy.
- As part of the first treatment (along with hormone therapy) for cancers that have grown outside of the prostate gland and into nearby tissues.
- If the cancer is not completely removed or comes back (recurs) in the area of the prostate after surgery.
- If the cancer is advanced, to reduce the size of the tumor and to provide relief from present and possible future symptoms.

The radiation may come from outside the body (external beam radiation) or from radioactive materials placed directly in the tumor (brachytherapy or internal radiation).

### **External beam radiation therapy (EBRT)**

For this treatment, beams of radiation are focused on the prostate gland from a machine outside the body. This type of radiation can be used to try to cure earlier stage cancers, or to help relieve symptoms such as bone pain if the cancer has spread to a specific area of bone.

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. Each treatment is painless and lasts only a few minutes, although the setup time — getting you into place for treatment — takes longer.

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**

**Bowel problems:** During and after treatment with EBRT, 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. Newer radiation techniques may be less likely to cause these problems.

**Bladder problems:** You might need to urinate more often, have burning while passing urine, and maybe see blood in your urine. Bladder problems usually get better over time, but they last in about 1 out of 3 men, 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.

**Erection problems, including impotence:** Impotence means that a man can't get an erection strong enough to have sex. Some men may still have erections that are not as firm as they once were. Erection problems usually do not happen right after radiation therapy but slowly develop over a year or more. After a few years, the impotence rate after radiation is about the same as that after surgery. As with surgery, the older you are, the more likely it is you will have problems with erections. Impotence may be helped by treatments such as those listed in the "Surgery" section, including erectile dysfunction medicines.

**Feeling tired:** Radiation treatment may 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 carries urine from the bladder out of the body may, rarely, be scarred and narrowed by radiation. This can cause problems with urination, and may 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." The doctor puts the seeds in place by inserting hollow needles through the skin between the anus and the scrotum during a minor operation. Radiation from the seeds travels a very short distance, so the seeds can put out a very large amount of radiation to a very small area. 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. It may not be a good option for men with large prostate glands.

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. The needles are then taken out, but 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.

### **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, as well as erection problems. Talk to your doctor if you have any problems. Often there are medicines or other methods to help.

## **Cryosurgery for prostate cancer**

Cryosurgery is sometimes used to treat early stage prostate cancer by freezing the cells with cold metal probes (hollow needles). It is used only for prostate cancer that has not spread, but it may not be a good option for men with large prostate glands.

The probes are placed through the skin between the anus and the scrotum. This method requires spinal or epidural anesthesia (where the lower half of your body is numbed) or general anesthesia (where you are asleep). Cold gases are then passed through the probes, which creates ice balls that destroy the prostate gland.

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 few weeks later.

You may need to stay in the hospital for a day, but many patients can leave the same day.

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.

### **Possible side effects of cryosurgery**

After the procedure, there will be some bruising and soreness in the area where the probes were 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.

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. Erection problems 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. Most men recover normal bowel and bladder function over time.

## Hormone therapy for prostate cancer

The goal of hormone therapy (also called *androgen deprivation*) is to lower the levels of the male hormones (androgens), such as testosterone, or to stop them from reaching prostate cancer cells. Androgens, which are made mostly in the testicles, cause prostate cancer cells to grow. Lowering androgen levels or stopping them from getting into prostate cancer cells often makes prostate cancer shrink or grow more slowly for a time. Hormone therapy alone 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 who can't have surgery or radiation or who can't be cured by these treatments because the cancer has already spread beyond the prostate.
- For men whose cancer remains or has come back after earlier treatment with surgery or radiation.
- Along with radiation as the first treatment in men who are at high risk of having the cancer return after treatment.
- Before radiation to try to shrink the cancer and make treatment more effective.

While hormone therapy does not cure the cancer on its own, 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 for men with advanced cancer (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.

**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 most of the androgens such as testosterone are made. While this is a fairly simple operation 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 once a month 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<sup>®</sup>) is an LHRH antagonist 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 small amounts of androgens.

Anti-androgens may be used along with orchiectomy or 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<sup>®</sup>) blocks androgens. It is most often used to treat patients with recently diagnosed disease and a large amount of cancer, as it is a quick way to lower testosterone levels. It can also be tried if other forms of hormone therapy are no longer working.

## Newer forms of hormone therapy

Some newer forms of hormone treatment may prove to be work better than some of those now in use.

**Abiraterone (Zytiga®):** Drugs such as LHRH agonists can stop the testicles from making androgens, but other cells in the body, including prostate cancer cells themselves, can still make small amounts, which may fuel cancer growth. Abiraterone blocks an enzyme that helps stop these cells from making certain hormones, including androgens.

Abiraterone is used mainly in men with advanced prostate cancer that is still growing despite low testosterone levels and who have already been treated with chemotherapy. Doctors are now looking to see if this drug might be helpful earlier in the course of the disease as well.

**Other new drugs:** Several other new medicines, including MDV3100 and orteronel, have shown promise in early studies. They are now being tested against prostate cancer, but are only given through clinical trials at this time. These drugs are discussed in the section, "What's new in prostate cancer research and treatment?"

### **Possible side effects of hormone therapy**

Orchiectomy, LHRH analogs, and LHRH antagonists can 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 (which 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

Some research has suggested that the risk of high blood pressure, diabetes, strokes, and heart attacks, and even death from heart disease is also higher in men treated with hormone therapy. But not all studies have found this.

**Anti-androgens** may have fewer sexual side effects than other forms of hormone therapy. When they are used alone, sexual desire and erections can often be maintained. These drugs can also cause diarrhea, nausea, and liver problems.

**Abiraterone** does not usually cause major side effects, although it can cause joint or muscle pain, high blood pressure, fluid buildup in the body, hot flashes, upset stomach, and diarrhea.

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). Drugs can help 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.

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. More studies are being done to look at this issue.

### **Current issues in 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) for prostate cancer**

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.

Doctors give chemo in cycles, with each period of treatment followed by a rest period to allow the body time to recover. Each cycle typically lasts for a few weeks.

There are many different chemo drugs. For prostate cancer, chemo drugs are typically used one at a time.

### **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
- Diarrhea
- 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 for prostate cancer

Sipuleucel-T (Provenge<sup>®</sup>) is a cancer vaccine used to treat advanced prostate cancer. Unlike most vaccines, this vaccine is aimed at treating prostate cancer, not preventing it.

This vaccine is made specially for each person who gets it. It is not mass produced. To make it, white blood cells are removed from the patient's blood and sent to a lab, where they are exposed to a protein from prostate cancer cells called *prostatic acid phosphatase* (PAP). These cells are then sent back to the doctor's office and 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.

Side effects from the vaccine tend to be milder than those from hormone therapy or chemotherapy. Short-term side effects can include 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 after treatment.

Studies to see if this vaccine can help men with less advanced prostate cancer are going on.

## Preventing and treating prostate cancer spread to bone

If prostate cancer grows outside of the prostate gland itself, it may first grow into nearby tissues or spread to nearby lymph nodes. After this, prostate cancer nearly always spreads to the bones. Spread of cancer to the bones can be painful and can also cause other problems, such as breaks or high blood calcium levels.

Preventing or slowing the spread of prostate cancer to the bones is a major goal of treatment if the cancer has grown outside of the prostate. If the cancer has already reached the bones, then it's important to control or relieve pain and other problems.

Treatments mentioned earlier, such as hormone therapy, chemo, and vaccines may help with this, but other treatments target cancer spread to the bones and the problems it may cause.

### **Bisphosphonates**

These drugs can help relieve bone pain and high calcium levels 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.

These drugs work by slowing down cells called *osteoclasts*, which normally break down the hard mineral structure of bones to help keep them healthy. But osteoclasts often become too active when prostate cancer cells spread to the bones, which can cause problems.

The most common bisphosphonate is zoledronic acid (Zometa<sup>®</sup>). It is given into the vein (IV), usually once every 3 or 4 weeks. Men given this drug are advised to take a supplement with calcium and vitamin D to prevent problems with low calcium levels.

Bisphosphonates can cause side effects, such as flu-like symptoms and bone or joint pain. They can also lead to kidney problems.

Some men have a very rare, but serious 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. These problems seem to be more common after having dental work done, 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.

### **Denosumab**

Denosumab (Xgeva<sup>®</sup>) is also a drug that can help when prostate cancer spreads to bone. Like the bisphosphonates, denosumab blocks bone cells called osteoclasts, but it does so in a different way. In men whose cancer has already spread to the bones, denosumab can help prevent or delay problems like fractures.

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.

Common side effects include nausea, diarrhea, and feeling weak or tired. 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).

### **Corticosteroids**

Some studies suggest that corticosteroid drugs can relieve bone pain for some men.

### **Radiation**

External radiation treatment can be used to treat bone pain caused by cancer that has spread to one or a few areas of bone.

Drugs called *radiopharmaceuticals* can be used if the cancer has spread to many bones. 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.

### **Pain medicines**

Pain medicines work very well. When the drugs are used as prescribed to treat cancer pain, it is very rare for them to cause addiction or dependence. Constipation and feeling sleepy are the most common problems, but there are things you can do to help prevent these. Side effects can often be managed by changing the dose or by adding other medicines.

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 for prostate cancer**

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](http://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](http://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. Sometimes they may be the only way to get some newer treatments. They are also 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 for prostate cancer

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 may 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 few or 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 prostate cancer treatment for me?**

If you have early stage 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, how likely it is the cancer will cause problems for you, your goals for treatment, and your feelings about side effects. Some men, for example, may want to avoid side effects such as incontinence or impotence for as long as they can. Others are less concerned about these and more focused on getting rid of the cancer.

If you are older or have serious health problems and your cancer is slow growing, 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. You might decide to choose active surveillance (careful follow-up with your doctor). 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 brachytherapy have about the same cure rates for the earliest stage prostate cancers. But you should think about the pros and cons to each type of treatment, including possible risks and side effects.

These decisions are even harder for you if you try to make them alone. 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.

It is often helpful to discuss treatment options with more than one type of doctor. It's natural for surgical specialists, such as urologists, to recommend surgery, and for radiation oncologists to recommend radiation. Talking to each of them may give you a better view of your options. Your primary care doctor can also help you sort out which treatment plan is best for you.

Many men find it very stressful to have to choose between treatment options, and are very fearful they will choose the "wrong" one. But in many cases there is no single best option. It's important to take your time and decide which option is right for you.

## **What are some questions I can ask my doctor about prostate cancer?**

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?
- Are there other types of doctors I should talk to before deciding on treatment?
- 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 risks or side effects should I 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?
- How quickly do I need to decide on treatment?
- What should I do to be ready for treatment?
- How long will treatment last? What will it involve? Where will it be done?
- How would treatment affect my daily activities?
- 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?
- What type of follow-up will I need after treatment?
- Where can I find more information and support?

Add your own questions below:

## Moving on after treatment for prostate cancer

For most men with prostate cancer, treatment may remove or destroy the cancer. Completing treatment can be both stressful and exciting. You may be relieved to finish treatment, but find it hard not to worry about cancer growing or coming back. (When cancer comes back after treatment, it is called *recurrence*.) This is a very common concern in people who have had cancer.

It may take a while before your fears lessen. But it may help to know that many cancer survivors have learned to live with this uncertainty and are leading full lives. Our document, *Living With Uncertainty: The Fear of Cancer Recurrence*, gives more detailed information on this.

For other men, the cancer may return or may never go away completely. These men may get treatment with hormone treatment or other treatments to help keep the cancer in check for as long as possible. Learning to live with cancer as a more of a chronic disease can be difficult and very stressful. It has its own type of uncertainty.

## Follow-up care

If you have finished treatment 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 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* can help 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
- If you had radiation treatment, a summary of the type and dose of radiation and when and where it was given
- Copies of imaging tests (CT or MRI scans, etc.), which can usually be stored on a CD, DVD, etc.

- If you had hormone therapy, chemo, or other drug treatments, a list of your drugs, drug doses, and when you took them

## Lifestyle changes after treatment for prostate cancer

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**

For many people, having had cancer helps them focus on their health in ways they may not have thought much about in the past. Are there things you could do that might make you healthier? Maybe you could try to eat better or get more exercise. Maybe you could cut down on the alcohol, or give up tobacco. Even things like keeping your stress level under control may help. Now is a good time to think about making changes that can have positive effects for the rest of your life. You will feel better and 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 the American Cancer Society for information and support. This tobacco cessation and coaching service can help increase your chances of quitting for good.

### **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. Getting to and staying at a healthy weight, eating a healthy diet, and limiting your alcohol intake may lower your risk for a number of types of cancer, as well as having many other health benefits.

### **Rest, 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.
- Along with a good diet, it helps you get to and stay at a healthy weight.
- It makes your muscles stronger.
- It reduces fatigue.
- It lowers anxiety and depression.
- It can make you feel generally happier.
- It can help you feel better about yourself.

Long term, we know that getting regular physical activity plays a role in helping to lower the risk of some cancers, as well as having other health benefits.

## **Can I lower my risk of the cancer growing or coming back?**

Most people want to know if there are certain lifestyle changes they can make to reduce their risk of cancer growing or coming back. Unfortunately, for most cancers there is little solid evidence to guide people. This doesn't mean that nothing will help – it's just that for the most part this is an area that hasn't been well studied. Most studies have looked at lifestyle changes as ways of preventing cancer in the first place, not slowing it down or keeping it from coming back.

Some recent research has suggested that men who exercise regularly after treatment may live longer than those who don't. It's not clear exactly how much activity might be needed, but more seems to be better. More vigorous activity may also be more helpful than less vigorous activity. Further studies are needed to follow up on these findings.

Other recent research has suggested that men who smoke are more likely to have their prostate cancer come back than men who don't smoke. More research is needed to see if quitting smoking is helpful, although quitting is already known to have a number of other health benefits.

Other healthy behaviors such as eating well and getting to or staying at a healthy weight may also help, but no one knows for sure. But we do know that these types of changes can have good effects on your health that can extend beyond your risk of prostate or other cancers.

## How about your emotional health after prostate cancer?

During and after treatment, you may find yourself overcome with many different emotions. 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 if medical bills pile up. Or you may begin to think about the changes that cancer has brought to your relationships with those around you. 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. Whatever your source of strength or comfort, make sure you have a place to go with your concerns.

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 to 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 for prostate cancer 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 is 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 document, *Hospice Care*.

Staying hopeful is important, too. Your hope for a cure may not be as bright, but there is still hope for good times with family and friends – times that are filled with joy and meaning. Pausing at this time in your cancer treatment gives you a chance to focus on the most important things in your life. Now is the time to do some things you've always wanted to do and to stop doing the things you no longer want to do. Though the cancer may be beyond your control, there are still choices you can make.

## **What's new in prostate cancer research?**

Research about prostate cancer 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 will help provide answers about the chemical changes that lead to prostate cancer. This may make it possible to design drugs to target 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. In fact, men taking the vitamin E supplements were later found to have a slightly higher risk of prostate cancer.

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 and other natural substances 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 blood tests are not yet available outside of research labs and will need more study before they are widely used to test for prostate cancer. Other new tests being studied are urine tests.

## 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. Doctors are also studying whether MRI can be used to help guide prostate biopsies.

## 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.

A newer type of PET scan may also be helpful in finding prostate cancer in different parts of the body, as well as helping to decide if treatment has been working. Studies of this technique are now in progress.

## 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 stage cancers:** 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 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 used outside of clinical trials 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:** One early 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 trying 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.

Another study 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 diet (no meat, fish, eggs, or dairy products) 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 study only followed the men for 1 year. Also, some men may find these changes hard to follow.

**Hormone treatment:** Several newer forms of hormone therapy have been developed in recent years. Some of these may be helpful even if standard forms of hormone therapy are no longer working. For instance, abiraterone (Zytiga<sup>®</sup>) is a drug that blocks an enzyme called *CYP17*. This drug, which was recently approved to help treat advanced prostate cancer, is described in the section, "Hormone therapy for prostate cancer." Newer drugs such as orteronel and MDV3100 have worked well in early studies.

**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*. Drugs that stop or slow the growth of these blood vessels are being studied for use against prostate cancer. Several of these drugs are now being tested in clinical trials.

**Preventing or treating spread of cancer to the bones:** Several newer medicines may help prevent or treat prostate cancer spread to the bones.

Doctors are also looking at a 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.

## More information about prostate cancer

### From your American Cancer Society

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

Prostate Cancer Detailed Guide (also in Spanish)

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

Clinical Trials: What You Need to Know

Living With Uncertainty: The Fear of Cancer Recurrence

Nutrition for the Person With Cancer: A Guide for Patients and Families (also in Spanish)

Managing Incontinence after Treatment for Prostate Cancer

Sex and Men With Cancer

Sexuality for the Man With Cancer (also in Spanish)

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

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

When Your Cancer Comes Back: Cancer Recurrence

**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 Complementary & Alternative Cancer Therapies*

*American Cancer Society Complete Guide to Family Caregiving, Second Edition*

*American Cancer Society Complete Guide to Nutrition for Cancer Survivors*

*American Cancer Society's Guide to Pain Control, Second Edition*

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

*What Helped Me Get Through: Cancer Patients Share Wisdom and Hope*

*What to Eat During Cancer Treatment*

*When the Focus Is on Care: Palliative Care and Cancer*

## **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: 1-800-828-7866

Web site: [www.urologyhealth.org](http://www.urologyhealth.org)

### **National Association for Continence**

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

Web site: [www.nafc.org](http://www.nafc.org)

### **National Cancer Institute**

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

Web site: [www.cancer.gov](http://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<sup>®</sup> orders

Web site: [www.canceradvocacy.org](http://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](http://www.zerocancer.org)

### **Prostate Cancer Foundation** (formerly "CaPCURE")

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

Web site: [www.pcf.org](http://www.pcf.org)

### **Us TOO International, Inc.**

Toll-free number: 1-800-808-7866 (1-800-80-US-TOO)

Web site: [www.ustoo.org](http://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](http://www.cancer.org).

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For additional assistance please contact your American Cancer Society  
1 - 800 - ACS-2345 or [www.cancer.org](http://www.cancer.org)