

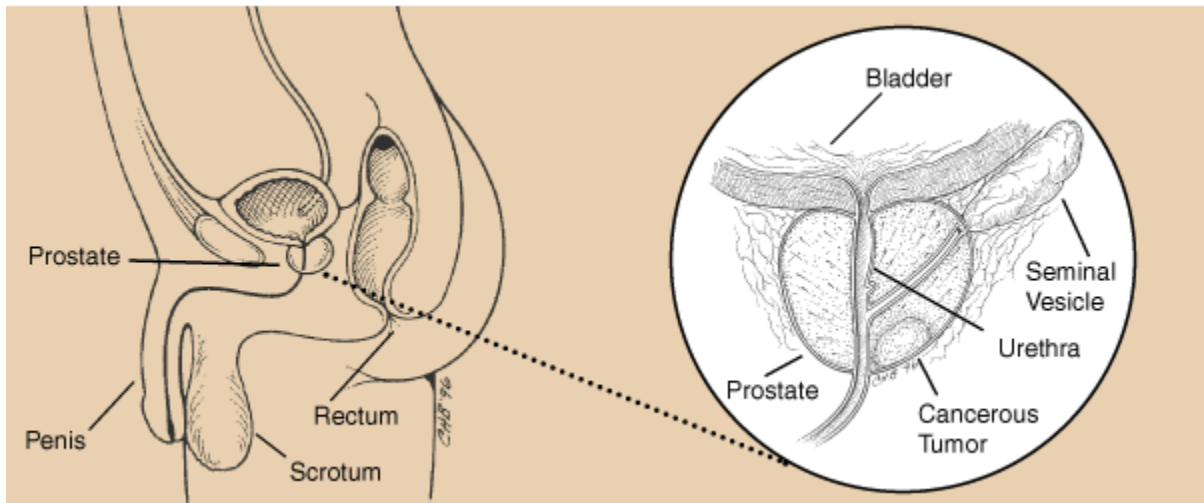


Prostate Cancer: Early Detection

What is prostate cancer?

To understand prostate cancer, it helps to know something about the prostate and nearby structures in the body. The prostate is a gland found only in males. It is located in front of the rectum and below the urinary bladder. 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 prostate's job is to make some of the fluid that protects and nourishes sperm cells in semen, making the semen more liquid. Just behind the prostate are glands called *seminal vesicles* that make most of the fluid for semen. The *urethra*, which is the tube that carries urine and semen out of the body through the penis, goes through the center of the prostate.



The prostate starts to develop before birth. It grows rapidly during puberty, fueled by male hormones (called androgens) in the body. The main androgen, *testosterone*, is made in the testicles. The enzyme *5-alpha reductase* converts testosterone into *dihydrotestosterone* (DHT). DHT is the main hormone that signals the prostate to grow.

The prostate usually stays at about the same size or grows slowly in adults, as long as male hormones are present.

Benign prostatic hyperplasia (BPH)

The inner part of the prostate (around the urethra) often keeps growing as men get older, which can lead to a common condition called *benign prostatic hyperplasia* (BPH). In BPH, the prostate tissue can press on the urethra, leading to problems passing urine.

BPH is *not* cancer and does not develop into cancer. But it can be a serious medical problem for some men. If it requires treatment, medicines can often be used to shrink the size of the prostate or to relax the muscles within 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.

Prostate cancer

Several types of cells are found in the prostate, but almost all prostate cancers develop from the gland cells. Gland cells make the prostate fluid that is added to the semen. The medical term for a cancer that starts in gland cells is *adenocarcinoma*.

Other types of cancer can also start in the prostate gland, including sarcomas, small cell carcinomas, and transitional cell carcinomas. But these other types of prostate cancer are so rare that if you have prostate cancer it is almost certain to be an adenocarcinoma.

Some prostate cancers can grow and spread quickly, but most of them grow slowly. In fact, autopsy studies show that many older men (and even some younger men) who died of other diseases also had prostate cancer that never affected them during their lives. In many cases neither they nor their doctors even knew they had it.

Finding prostate cancer early

The word *screening* refers to testing to find a disease like cancer in people who do not have symptoms of that disease. For some types of cancer, screening can help find cancers at an early stage, when they are more easily cured. The goal of screening is to help people live healthier, longer lives.

The goal of screening for prostate cancer is to find it early, in the hope that it can be treated more effectively.

Prostate cancer can often be found early by testing the amount of prostate-specific antigen (PSA) in a man's blood. Another way to find prostate cancer early is the digital rectal exam (DRE). For this exam, the doctor puts a gloved finger into the rectum to feel the prostate gland. These 2 tests are described in more detail in the section, "What tests can detect prostate cancer?"

If the results of either one of these tests are abnormal, further testing is needed to see if there is a cancer. If prostate cancer is found as a result of screening with the PSA test or

DRE, it will probably be at an earlier, more treatable stage than if no screening were done.

Since using early detection tests for prostate cancer became relatively common in the United States (about 1990), the prostate cancer death rate has dropped. But it isn't clear yet that this drop is a direct result of screening. It could also be caused by something else, like improvements in treatment.

There is no question that screening can help spot many prostate cancers early, but there are limits to the prostate cancer screening tests used today. Neither the PSA test nor the DRE is 100% accurate. These tests can sometimes have abnormal results even when a man does not have cancer (known as *false-positive* results). Normal results can also occur even when a man does have cancer (known as *false-negative* results). Unclear test results can cause confusion and anxiety. False-positive results can lead some men to have a prostate biopsy (with small risks of pain, infection, and bleeding) when they do not have cancer. And false-negative results can give some men a false sense of security even though they actually have cancer.

Another important issue is that even if screening detects a cancer, doctors often can't tell if the cancer is truly dangerous. Finding and treating all prostate cancers early might seem as if it would always be a good thing, but some prostate cancers grow so slowly that they would probably never cause problems. Because of an elevated PSA level, some men may be diagnosed with a prostate cancer that they would have never even known about at all. It would never have led to their death, or even caused any symptoms.

But these men may still be treated with either surgery or radiation, either because the doctor can't be sure how quickly the cancer might grow and spread, or because the men are uncomfortable knowing they have cancer and not getting any treatment. Treatments like surgery and radiation can have urinary, bowel, and/or sexual side effects that may seriously affect a man's quality of life.

Men and their doctors may end up struggling over whether they need treatment or whether they might be able to be followed without being treated right away (an approach called *watchful waiting* or *active surveillance*). Even when men are not treated right away, they still need regular blood tests and prostate biopsies to determine the need for future treatment. These tests are linked with risks of anxiety, pain, infection, and bleeding.

To help figure out if prostate cancer screening is worthwhile, doctors are conducting large studies to see if early detection tests will lower the risk of death from prostate cancer. The most recent results from 2 large studies were conflicting, and didn't offer clear answers.

Early results from a study done in the United States found that annual screening with PSA and DRE did detect more prostate cancers than in men not screened, but this screening did not lower the death rate from prostate cancer. A European study did find a lower risk of death from prostate cancer with PSA screening (done about once every 4 years), but the researchers estimated that about 1,400 men would need to be screened (and 48 treated) in order to prevent one death from prostate cancer. Neither of these

studies has shown that PSA screening helps men live longer (lowers the overall death rate).

Prostate cancer is often a slow-growing cancer, so the effects of screening in these studies may become clearer in the coming years. Both of these studies are being continued to see if longer follow-up will give clearer results. Several other large studies of prostate cancer screening are now going on as well.

At this time, the American Cancer Society recommends that men thinking about prostate cancer screening should make informed decisions based on available information, discussion with their doctor, and their own views on the benefits and side effects of screening and treatment. (See the section called “American Cancer Society recommendations for prostate cancer early detection.”)

Until more information is available, you and your doctor can decide whether you should have tests to screen for prostate cancer. There are many factors to take into account, including your age and health. If you're young and develop prostate cancer, it may shorten your life if it's not caught early. Screening men who are older or in poor health in order to find early prostate cancer is less likely to help them live longer. This is because most prostate cancers are slow-growing, and men who are older or sicker are likely to die from other causes before their prostate cancer grows enough to cause problems.

American Cancer Society recommendations for prostate cancer early detection

The American Cancer Society (ACS) recommends that men have a chance to make an informed decision with their health care provider about whether to be screened for prostate cancer. The decision should be made after getting information about the uncertainties, risks, and potential benefits of prostate cancer screening. Men should not be screened unless they have received this information.

The discussion about screening should take place at age 50 for men who are at average risk of prostate cancer and are expected to live at least 10 more years.

This discussion should take place starting at age 45 for men at high risk of developing prostate cancer. This includes African Americans and men who have a first-degree relative (father, brother, or son) diagnosed with prostate cancer at an early age (younger than age 65).

This discussion should take place at age 40 for men at even higher risk (those with more than one first-degree relative who had prostate cancer at an early age).

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

If, after this discussion, a man is unable to decide if testing is right for him, the screening decision can be made by the health care provider, who should take into account the patient's general health preferences and values.

Assuming 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 choose to be tested who have a PSA of less than 2.5 ng/ml, 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 do not have a 10-year life expectancy should not be offered testing since they are not likely to benefit. Overall health status, and not age alone, is important when making decisions about screening.

Even after a decision about testing has been made, the discussion about the pros and cons of testing should be repeated as new information about the benefits and risks of testing becomes available. Further discussions are also needed to take into account changes in the patient's health, values, and preferences.

What tests can detect prostate cancer?

The tests discussed below are used to look for warning signs of prostate cancer. But these early detection tests can't tell for sure if a man has cancer. If the result of one of these tests is abnormal, you will probably need a *prostate biopsy* to determine if you have cancer. (A biopsy uses needles to take samples from the prostate and looking at the cells under a microscope.)

Prostate-specific antigen (PSA) blood test

Prostate-specific antigen (PSA) is a substance made by cells in the prostate gland (both normal cells and cancer cells). PSA is mostly found in semen, but a small amount is also found in the blood. Most healthy men have levels under 4 nanograms per milliliter (ng/mL) of blood. The chance of having prostate cancer goes up as the PSA level goes up.

When prostate cancer develops, the PSA level usually goes above 4. Still, a level below 4 does not guarantee that a man doesn't have cancer – about 15% of men with a PSA below 4 will have prostate cancer on a biopsy. Men with borderline PSA level between 4 and 10 have about a 1 in 4 chance of having prostate cancer. If the PSA is more than 10, the chance of having prostate cancer is over 50%.

If your PSA level is high, your doctor may advise either waiting a while and repeating the test, or getting a prostate biopsy to find out if you have cancer (see the section, “What if the test results aren't normal?”). Not all doctors use the same PSA cutoff point when advising whether to do a biopsy. Some may advise it if the PSA is 4 or higher, while

others might recommend it at 2.5 or higher. Other factors, such as your age, race, and family history, may also come into play.

Factors that might affect PSA levels

The PSA level can also be increased by a number of factors other than prostate cancer, such as:

- **An enlarged prostate:** Conditions such as *benign prostatic hyperplasia* (BPH), a non-cancerous enlargement of the prostate that many men get as they grow older, may raise PSA levels.
- **Older age:** PSA levels normally go up slowly as you get older, even if you have no prostate abnormality.
- **Prostatitis:** This term refers to infection or inflammation of the prostate gland, which may raise PSA levels.
- **Ejaculation:** This can cause the PSA to go up for a short time, and then go down again. This is why some doctors suggest that men abstain from ejaculation for 2 days before testing.
- **Riding a bicycle:** Some studies have suggested that cycling may raise PSA levels (possibly because the seat puts pressure on the prostate), although not all studies have found this.
- **Certain urologic procedures:** Some procedures done in a doctor's office that affect the prostate, such as a prostate biopsy or cystoscopy, may result in higher PSA levels for a short time. Some studies have suggested that a digital rectal exam (DRE) might raise PSA levels slightly, although other studies have not found this. Still, if both a PSA test and a DRE are being done during a doctor visit, some doctors advise having the blood drawn for the PSA before having the DRE, just in case.
- **Certain medicines:** Taking testosterone (or other medicines that raise testosterone levels) may cause a rise in PSA.

Some things might cause PSA levels to go down (even if cancer is present):

- **Certain medicines:** Certain drugs used to treat BPH or urinary symptoms, such as finasteride (Proscar or Propecia) or dutasteride (Avodart), may lower PSA levels. You should tell your doctor if you are taking these medicines because they may lower PSA levels and require the doctor to adjust the reading.
- **Herbal mixtures:** Some mixtures that are sold as dietary supplements may also mask 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 that are not necessarily meant for prostate health. Saw palmetto (an herb used by some men to treat BPH) does not seem to affect PSA.
- **Obesity:** Obese (very overweight) men tend to have lower PSA levels.

- **Aspirin:** Some recent research has suggested that men taking aspirin regularly may have lower PSA levels. This effect may be greater in non-smokers. More research is needed to confirm this finding. If you take aspirin regularly (such as to help prevent heart disease), talk to your doctor before you stop taking it for any reason.

For men not known to have prostate cancer, it is not always clear if lowering the PSA is helpful. In some cases the factor that lowers the PSA may also lower a man's risk of prostate cancer. But in other cases, it might lower the PSA level without affecting a man's risk of cancer. This could actually be harmful, if it were to lower the PSA from an abnormal level to a normal one, as it might result in not detecting a cancer. This is why it is important to talk to your doctor about anything that might affect your PSA level.

Newer types of PSA tests

Some doctors might consider using newer types of PSA tests (discussed below) to help decide if you need a prostate biopsy, but not all doctors agree on how to use these other PSA tests. If your PSA test result is not normal, ask your doctor to discuss your cancer risk and your need for further tests.

Percent-free PSA

PSA occurs in 2 major forms in the blood. One form is attached to blood proteins while the other circulates free (unattached). The *percent-free PSA* (fPSA) is the ratio of how much PSA circulates free compared to the total PSA level. The percentage of free PSA is lower in men who have prostate cancer than in men who do not.

This test is sometimes used to help decide if you should have a prostate biopsy if your PSA results are in the borderline range (between 4 and 10). A *lower* percent-free PSA means that your likelihood of having prostate cancer is higher and you should probably have a biopsy. Many doctors recommend biopsies for men whose percent-free PSA is 10% or less, and advise that men consider a biopsy if it is between 10% and 25%. Using these cutoffs detects most cancers and helps some men avoid unnecessary prostate biopsies. This test is widely used, but not all doctors agree that 25% is the best cutoff point to decide on a biopsy, and the cutoff may change depending on PSA level.

A newer test, known as *complexed PSA*, directly measures the amount of PSA that is attached to other proteins (the portion of PSA that is not "free"). This test is done instead of checking the total and free PSA, and it could give the same amount of information as the other two done separately. Studies are now under way to see if this test provides the same level of accuracy.

PSA velocity

The PSA velocity is not a separate test. It is a measure of how fast the PSA rises over time. Normally, PSA levels go up slowly with age. Some research has found that these levels go up faster if a man has cancer, but studies have not shown that the PSA velocity is more helpful than the PSA level itself in finding prostate cancer. For this reason, the ACS guideline does not recommend using the PSA velocity as part of screening for prostate cancer.

PSA density

PSA levels are higher in men with larger prostate glands. The PSA density (PSAD) is sometimes used for men with large prostate glands to try to adjust for this. The doctor measures the volume (size) of the prostate gland with transrectal ultrasound (discussed below) and divides the PSA number by the prostate volume. A higher PSA density indicates a greater likelihood of cancer. PSA density has not been shown to be as useful as the percent-free PSA test.

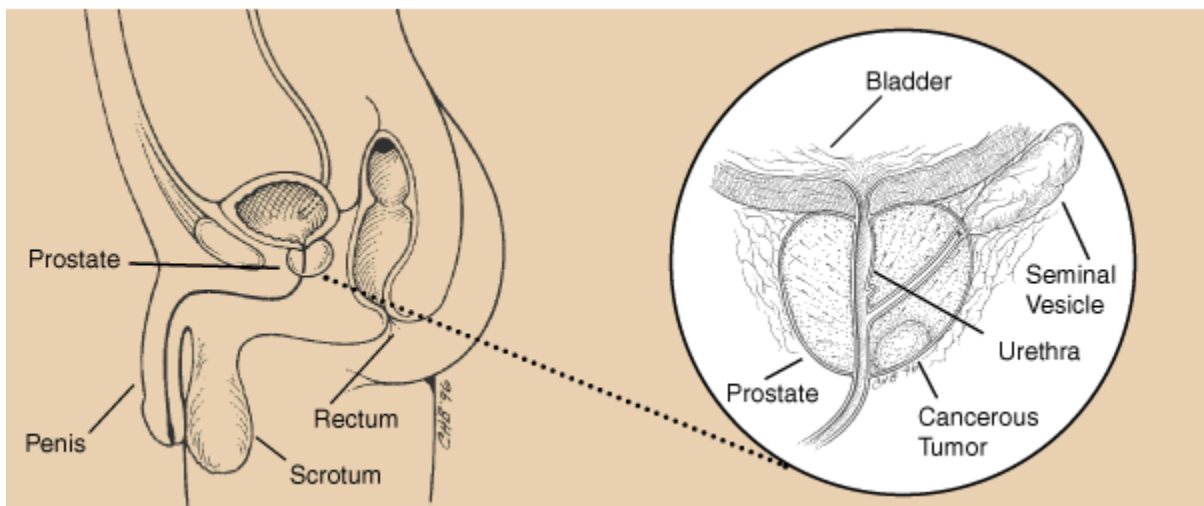
Age-specific PSA ranges

PSA levels are normally higher in older men than in younger men, even when there is no cancer. A PSA result within the borderline range might be very worrisome in a 50-year-old man but cause less concern in an 80-year-old man. For this reason, some doctors have suggested comparing PSA results with results from other men of the same age.

But because the usefulness of age-specific PSA ranges is not well proven, most doctors and professional organizations (as well as the makers of the PSA tests) do not recommend their use at this time.

Digital rectal exam (DRE)

For a digital rectal exam (DRE), the doctor inserts a gloved, lubricated finger into the rectum to feel for any bumps or hard areas on the prostate that might be cancer. As shown in the picture below, the prostate gland is just in front of the rectum, and most cancers begin in the back part of the gland, which can be felt during a rectal exam. This exam can be uncomfortable (especially in men who have hemorrhoids), but it usually isn't painful and only takes a short time.



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 included as a part of prostate cancer screening.

Transrectal ultrasound (TRUS)

Transrectal ultrasound (TRUS) uses sound waves to make an image of the prostate on a video screen. For this test, a small probe that gives off sound waves is placed in the rectum. The sound waves 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 image of the prostate.

The procedure often takes less than 10 minutes and is done in a doctor's office or outpatient clinic. The ultrasound probe is about the width of a finger and is lubricated before it is placed in your rectum. You will feel some pressure when the TRUS probe is placed in your rectum, but it is usually not painful. The area may be numbed before the procedure.

TRUS is not used as a screening test for prostate cancer because it can't always tell the difference between normal tissue and cancer. Instead, it is most often used during a prostate biopsy (described in the section "What if the test results aren't normal?"). TRUS is used to guide the biopsy needles into the right area of the prostate.

TRUS is useful in other situations as well. It can be used to measure the size of the prostate gland, which can help determine the PSA density and may also affect which treatment options a man has.

What if the test results aren't normal?

If the results of early detection tests – the prostate-specific antigen (PSA) blood test and/or digital rectal exam (DRE) – suggest that you might have prostate cancer, your doctor will do a prostate biopsy to find out.

Prostate biopsy

A biopsy is a procedure in which a sample of body tissue is removed and then looked at under a microscope. A *core needle biopsy* is the main method used to diagnose prostate cancer. It is usually done by a urologist, a surgeon who treats cancers of the genital and urinary tract, which includes the prostate gland.

Using transrectal ultrasound to "see" the prostate gland, the doctor quickly inserts a thin, hollow needle through the wall of the rectum into the prostate gland. When the needle is pulled out, it removes a small cylinder (core) of prostate tissue. This is repeated from 8 to 18 times, but most urologists will take about 12 samples.

Though the procedure sounds painful, it usually causes only a brief uncomfortable sensation because it is done with a special spring-loaded biopsy instrument. The device inserts and removes the needle in a fraction of a second. Most doctors who do the biopsy will numb the area first with local anesthetic. You might want to ask your doctor if he or she plans to do this.

The biopsy itself takes about 10 minutes and is usually done in the doctor's office. You will likely be given antibiotics to take before the biopsy and possibly for a day or 2 after to reduce the risk of infection.

For a few days after the procedure, you may feel some soreness in the area and will probably notice blood in your urine. You may also have some light bleeding from your rectum, especially if you have hemorrhoids. Many men also see some blood in their semen or have rust colored semen. This can last for several weeks after the biopsy, depending on how frequently you ejaculate.

Your biopsy samples will be sent to a lab, where a *pathologist* (a doctor who specializes in diagnosing disease in tissue samples) will look at them under a microscope to see if they contain cancer cells. If cancer is present, the pathologist will also assign it a *grade*, also known as a *Gleason score* (or *Gleason sum*), which is number between 2 and 10. The higher your Gleason score, the more likely it is that your cancer will grow and spread quickly.

Getting the biopsy results usually takes at least 1 to 3 days, but it can take longer.

Even taking many samples, biopsies can still sometimes miss a cancer if none of the biopsy needles pass through it. This is known as a *false negative* result. If your doctor still strongly suspects prostate cancer (due to a very high PSA level, for example) a repeat biopsy may be needed to help be sure.

Prostate biopsy results are sometimes called *suspicious*. The pathologist may use terms such as prostatic intraepithelial neoplasia (PIN), atypical small acinar proliferation (ASAP, or just atypia), or proliferative inflammatory atrophy (PIA). Suspicious results mean that the cells do not look quite normal, but they don't look like cancer, either. If your biopsy results come back suspicious, your doctor may want to repeat the biopsy.

More information about the possible results of prostate biopsies can be found in our document, *Prostate Cancer*.

What are the signs and symptoms of prostate cancer?

Early prostate cancer usually causes no symptoms. Some advanced prostate cancers can slow or weaken your urinary stream or make you need to urinate more often, especially at night. But non-cancerous diseases of the prostate, such as benign prostatic hyperplasia (BPH) are a more common cause of these symptoms.

If the prostate cancer is advanced, you might develop blood in your urine (hematuria) or trouble getting an erection (impotence). Advanced prostate cancer commonly spreads to the bones, which can cause pain in the hips, back (spine), ribs (chest), or other areas. Sometimes cancer that has spread to the bones of the spine will press on the spinal cord or its nerves, causing weakness or numbness in the legs or feet, or even loss of bladder or bowel control.

Other diseases can also cause many of these same symptoms. It is important to tell your doctor about any of them so that the cause can be determined and treated, if needed.

What are the risk factors for prostate cancer?

A risk factor is anything that affects your chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like 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.

We don't yet completely understand the causes of prostate cancer, but researchers have found several factors that might change the risk of getting it. 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, but the chance of having prostate cancer rises rapidly after age 50. Almost 2 out of 3 prostate cancers are found in men over the age of 65.

Race/ethnicity

Prostate cancer occurs more often in African-American men than in men of other races. African-American men are also more likely to be diagnosed at an advanced stage, and are more than twice as likely to die of prostate cancer as white men. 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, Australia, and on Caribbean islands. It is less common in Asia, Africa, Central America, and South America.

The reasons for this are not clear. More intensive screening in some developed countries very likely accounts for at least part of this difference, but other factors such as lifestyle differences (diet, etc.) are likely to be important as well. For example, men of Asian descent living in the United States have a lower risk of prostate cancer than white Americans, but their risk is higher than that of men of similar backgrounds living in Asia.

Family history

Prostate cancer seems to run in some families, which suggests that in some cases there may be an inherited or genetic factor. Having a father or brother with prostate cancer more than doubles a man's risk of developing this disease. (The risk is higher for men who have a brother with the disease than for those with an affected father.) The risk is much higher for men with several affected relatives, particularly if their relatives were young at the time the cancer was found.

Genes

Scientists have found several inherited gene changes 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 gene changes is not yet available.

Some inherited gene changes raise the risk for more than one type of cancer. For example, inherited mutations of the BRCA1 or BRCA2 genes are the reason that breast and ovarian cancers are much more common in some families. Mutations in these genes may also increase prostate cancer risk in some men, but they account for a very small percentage of prostate cancer cases.

Recently, some common gene variations have been linked to a higher risk of prostate cancer. Studies to confirm this are needed to see if testing for the gene variants will be useful in predicting prostate cancer risk.

Diet

The exact role of diet in prostate cancer is not clear, but several factors have been studied.

Men who eat a lot of red meat or high-fat dairy products appear to have a slightly higher chance of getting prostate cancer. These men also tend to eat fewer fruits and vegetables. Doctors are not sure which of these factors is responsible for raising the risk.

Some studies have suggested that men who consume a lot of calcium (through food or supplements) may have a higher risk of developing advanced prostate cancer. Most studies have not found such a link with the levels of calcium found in the average diet, and it's important to note that calcium is known to have other important health benefits.

Obesity

Most studies have not found that being obese (very overweight) is linked with a higher risk of getting prostate cancer overall.

Some studies have found that obese men have a lower risk of getting a low-grade (less dangerous) form of the disease, but a higher risk of getting more aggressive prostate cancer. The reasons for this are not clear.

Some studies have also 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.

Exercise

Exercise may slightly lower prostate cancer risk. High levels of physical activity, particularly in older men, may lower the risk of advanced prostate cancer. More research in this area is needed.

Smoking

Most studies have not found a link between smoking and the risk of developing prostate cancer. Some recent research has 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.

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. Inflammation is often seen in samples of prostate tissue that also contain cancer. The link between the two is not yet clear, but this is an active area of research.

Sexually transmitted infections

Researchers have looked to see if sexually transmitted infections (like gonorrhea or chlamydia) might increase the risk of prostate cancer. These infections could increase cancer risk by leading to inflammation of the prostate. So far, studies have not agreed, and no firm conclusions have been reached.

Vasectomy

Some earlier studies had suggested that men who have a vasectomy (minor surgery to make men infertile) – especially those younger than 35 at the time of the procedure – may have a slightly increased risk for prostate cancer. But most recent studies have not found any increased risk among men who have had this operation. Fear of an increased risk of prostate cancer should not be a reason to avoid a vasectomy.

Can prostate cancer be prevented?

Because the exact cause of prostate cancer is not known, at this time it is not possible to prevent most cases of the disease. Many risk factors such as age, race, and family history cannot be controlled. 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, physical activity, 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 physical activity 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. Examples of 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 be sensible 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 certain vitamin or mineral supplements might lower prostate cancer risk. Of special interest were vitamin E and the mineral selenium.

To study the possible effects of selenium and vitamin E on prostate cancer risk, doctors conducted the Selenium and Vitamin E Cancer Prevention Trial (SELECT). Men in this large study took one or both of these supplements or an inactive placebo each day for about 5 years. Neither vitamin E nor selenium was found to lower prostate cancer risk in this study. In fact, men taking the vitamin E supplements were later found to have a slightly higher risk of prostate cancer.

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

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.

Medicines

Some drugs may help reduce the risk of prostate cancer.

5-alpha reductase inhibitors

5-alpha reductase is the enzyme in the body that changes testosterone into dihydrotestosterone (DHT), the main hormone that causes the prostate to grow. Drugs called 5-alpha reductase inhibitors block the enzyme and prevent the formation of DHT.

Two 5-alpha reductase inhibitors are already in use to treat benign prostatic hyperplasia (BPH), a non-cancerous growth of the prostate:

- Finasteride (Proscar[®])
- Dutasteride (Avodart[®])

Large studies of both of these drugs have been done to see if they might also be useful in lowering the prostate cancer risk. In these studies, men taking either drug were less likely to develop prostate cancer after several years than men getting an inactive placebo.

However, 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 such as lowered sexual desire and impotence. But they can help with urinary problems such as trouble urinating and leaking urine (incontinence).

At this time, not all doctors agree taking finasteride or dutasteride specifically to lower prostate cancer risk is a good thing. Men who want to know more about this should discuss it with their doctors.

Other drugs

Other drugs and dietary supplements that may help lower prostate cancer risk are now being tested in clinical trials. No other drug or supplement has been found to be helpful in studies large enough to allow experts to recommend whether or not they should be given to men.

State efforts to ensure prostate cancer screening coverage

The American Cancer Society supports legislation assuring that men will receive insurance coverage for prostate screening exams. The Society recognizes that differing opinions exist as to whether early detection testing for prostate cancer lowers disease-specific mortality. Until such time when studies are conclusive, patients, in consultation with their doctors, should be free to determine on an individual basis whether testing is

appropriate. Prostate cancer screening should not be prevented because of the reimbursement limitations of health insurance plans.

The American Cancer Society does not support routine testing for prostate cancer at this time because we believe proper pretest guidance and education is necessary. Doctors and other clinicians should provide information on the potential risks and benefits of PSA testing to appropriate patients, allowing them to make an informed decision on testing.

States have passed laws on a variety of issues relating to prostate cancer including:

- Assured health insurance coverage for prostate cancer screening
- Public education on prostate cancer
- Prostate cancer research funds

Many states have laws assuring that private health insurers cover procedures to detect prostate cancer, including the PSA test and DRE (see table below). Some of these states also assure that public employee benefit health plans provide coverage for prostate cancer screening procedures. Most state laws assure annual coverage for men ages 50 and over and for high-risk men, ages 40 and over. High risk refers to African-American men and/or men with a family history of prostate cancer. Some states may have slightly different coverage requirements.

States with prostate cancer screening coverage laws

State	States with prostate cancer screening coverage laws	States with prostate cancer screening mandated offering laws*
Alaska	X	
Arkansas	X	
California	X	
Colorado	X	
Connecticut	X	
Delaware	X	
Georgia	X	
Illinois	X	
Indiana	X	
Kansas	X	
Louisiana	X	

Maine	X	
Maryland	X	
Minnesota	X	
Missouri	X	
New Jersey	X	
New York	X	
North Carolina	X	
North Dakota	X	
Oklahoma		X
Rhode Island	X	
South Carolina	X	
South Dakota	X	
Tennessee	X	
Texas	X	
Vermont	X	
Virginia	X	
Washington	X	
Wyoming	X	

** A Mandated Offering Law requires insurance companies to offer coverage for prostate cancer screening. It is not required that the purchaser select prostate cancer screening coverage.*

Sources: National Conference of State Legislatures, October 2011, Department of Insurance, State of South Carolina

Medicare coverage

Medicare covers a DRE and a prostate-specific antigen (PSA) blood test once a year for all men with Medicare age 50 and over. There is no co-insurance and no Part B deductible for the PSA test. For other services, the beneficiary would pay 20% of the Medicare-approved amount after the yearly Part B deductible.

Additional resources

More information from your American Cancer Society

The following related information may also be helpful to you. These materials may be ordered from our toll-free number, 1-800-227-2345.

Facts on Prostate Cancer and Prostate Cancer Testing

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

Prostate Cancer (also available in Spanish)

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

National organizations and Web sites*

In addition to the American Cancer Society, other sources of information and support include:

American Urological Association Foundation

Toll-free number: 1-800-828-7866

Web site: www.urologyhealth.org

National Cancer Institute

Toll-free number: 1-800-422-6237 (1-800-4-CANCER); TYY: 1-800-332-8615

Web site: www.cancer.gov

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

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

Web site: www.zerocancer.org

Prostate Cancer Foundation (formerly "CaPCURE")

Toll-free number: 1-800-757-2873 (1-800-757-CURE) or 1-310-570-4700

Web site: www.pcf.org

US Too International, Inc.

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

Web site: www.ustoo.com

**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.

References

American Cancer Society. *Cancer Facts & Figures 2012*. Atlanta, Ga: American Cancer Society; 2012.

American Cancer Society. Prostate Cancer. Cancer Information Database. 2012.

National Conference of State Legislatures. Prostate cancer screening mandates. 2011. Accessed at www.ncsl.org/issues-research/health/prostate-cancer-screening-mandates.aspx on February 21, 2012.

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