



PENILE CANCER

What is cancer?

The body is made up of hundreds of millions of living cells. Normal body cells grow, divide, and die in an orderly fashion. 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 or dying cells or to repair injuries.

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 out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells continue to grow and form new, abnormal cells. Cancer cells can also invade (grow into) other tissues, something that normal cells cannot do. Growing out of control and invading other tissues are what makes a cell a cancer cell.

Cells become cancer cells because of damage to DNA. DNA is in every cell and directs all its actions. In a normal cell, when DNA gets damaged the cell either repairs the damage or the cell dies. In cancer cells, the damaged DNA is not repaired, but the cell doesn't die like it should. Instead, this cell goes on making new cells that the body does not need. These new cells will all have the same damaged DNA as the first cell does.

People can inherit damaged DNA, but most DNA damage is caused by mistakes that happen while the normal cell is reproducing or by something in our environment. Sometimes the cause of the DNA damage is something obvious, like cigarette smoking. But often no clear cause is found.

In most cases the cancer cells form a tumor. Some cancers, like leukemia, rarely form tumors. Instead, these cancer cells involve the blood and blood-forming organs and circulate through other tissues where they grow.

Cancer cells often travel to other parts of the body, where they begin to grow and form new tumors that replace normal tissue. This process is called metastasis. It happens when the cancer cells get into the bloodstream or lymph vessels of our body.

No matter where a cancer may spread, it is always named for the place where it started. For example, 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 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 particular kind of cancer.

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

What is penile cancer?

To understand penile cancer, it helps to know about the normal structure and function of the penis.

About the penis

The penis is the external male sexual organ, as well as part of the urinary system. It contains several types of tissue, including skin, nerves, smooth muscle, and blood vessels.

The main part of the penis is known as the *shaft*, and the head of the penis is called the *glans*. At birth, the glans is covered by a piece of skin called the *foreskin*, or prepuce. The foreskin is often removed in infant boys in an operation called a circumcision.

Inside the penis are 3 chambers that contain a soft, spongy network of blood vessels. Two of these cylinder-shaped chambers, known as the *corpora cavernosa*, lie on either side of the upper part of the penis. The third lies below them and is known as the *corpus spongiosum*. This chamber widens at its end to form the glans. The corpus spongiosum surrounds the *urethra*, a thin tube that starts at the bladder and runs through the penis. Urine and semen travel through the urethra and leave the body through an opening in the glans of the penis, called the *meatus*.

When a man gets an erection, nerves signal to his body to store blood in the vessels inside the corpora cavernosa. As the blood fills the chambers, the spongy tissue expands, causing the penis to elongate and stiffen. After ejaculation, the blood flows back into the body, and the penis becomes soft again.

Semen is made up of fluid produced by the prostate gland and the seminal vesicles (2 small sacs near the bladder and prostate), plus sperm cells that are made in the testicles. It is stored in the seminal vesicles. During ejaculation, semen passes into the urethra and out the meatus at the tip of the penis.

Cancers of the penis

Each of the tissues in the penis contains several types of cells. Different types of penile cancer (cancer of the penis) can develop in each kind of cell. The differences are important because they determine the seriousness of the cancer and the type of treatment needed.

Almost all penile cancers start in skin cells of the penis.

Squamous cell carcinoma

About 95% of penile cancers develop from flat skin cells called *squamous cells*. Squamous cell cancers can develop anywhere on the penis. Most of these cancers are found on the foreskin (in men who have not been circumcised) or on the glans. These tumors tend to grow slowly. If they are found at an early stage, these tumors can usually be cured.

Verrucous carcinoma: This is an uncommon form of squamous cell cancer that can occur in the skin in many areas. A verrucous carcinoma growing on the penis is also known as *Buschke-Lowenstein tumor*. This cancer looks a lot like a large benign genital wart. These cancers tend to grow slowly but can sometimes grow to a very large size. They can invade deeply into surrounding tissue, but they rarely spread to other parts of the body.

Carcinoma in situ (CIS): This is the earliest stage of squamous cell cancer of the penis. In this stage the cancer cells are only found in the top layers of skin -- they have not yet grown into the deeper tissues of the penis. Depending on the location of a CIS of the penis, doctors may use other names for the disease. CIS of the glans is sometimes called *erythroplasia of Queyrat*. The same condition when found on the shaft of the penis (or other parts of the genitals) is called *Bowen disease*.

Melanoma

Melanoma is a type of skin cancer that starts in melanocytes, the cells that make the brownish pigment that provides color to the skin and helps protect it from the sun. These cancers tend to grow and spread quickly and are more dangerous than other types of skin cancer. Although melanomas are most often found in sun-exposed skin, they do rarely occur

in other areas. Less than 2% of penile cancers are melanomas. For more information about melanoma and its treatment, please see our document, *Melanoma Skin Cancer*.

Basal cell cancer

Basal cell cancer is another type of skin cancer that can develop on the penis. It makes up less than 2% of penile cancers. This type of cancer is slow-growing and rarely spreads to other parts of the body.

Adenocarcinoma (Paget disease of the penis)

This very rare type of penile cancer can develop from sweat glands in the skin of the penis. It can be very hard to tell apart from carcinoma in situ of the penis. At first, the cancer cells spread within the skin. Later on, these cells can invade, growing into the tissues underneath the skin and then spreading to lymph nodes.

Sarcoma

A small number of penile cancers develop from the blood vessels, smooth muscle, or other connective tissue cells of the penis and are called sarcomas. This document does not further discuss sarcoma. For more information about this type of cancer, please see our document, *Sarcoma -- Adult Soft Tissue Cancer*.

Benign conditions of the penis

Sometimes, growths can develop on the penis that are abnormal but are not cancers (they are benign). These lesions can look like warts or irritated patches of skin. Like penile cancer, they are most often found on the glans or on the foreskin, but they can also occur along the shaft of the penis.

Condylomas

These are wart-like growths that look like tiny cauliflowers. Some are so small that they can only be seen when the skin is viewed under a magnifying lens. Others may be as large as an inch or more across. Condylomas are caused by infection with human papilloma virus (HPV).

Bowenoid papulosis

In this condition, dysplastic (abnormal) cells are seen only in the surface layer of the penile skin. This condition tends to occur in younger men and is seen as small, reddish, pimple-like patches on the shaft of the penis. Bowenoid papulosis can be mistaken for CIS, but most doctors agree it is not cancer or a pre-cancerous condition.

What are the key statistics about penile cancer?

The American Cancer Society estimates that in the United States about 1,290 new cases of penile cancer will be diagnosed and an estimated 300 men will die of penile cancer in 2009. Penile cancer occurs in about 1 man in 100,000 in the United States.

Penile cancer is very rare in North America and Europe. It accounts for less than 1% of cancers in men in the United States. However, penile cancer is much more common in some parts of Asia, Africa, and South America, where it accounts for up to 10% of cancers in men.

What are the risk factors for penile cancer?

A risk factor is anything that affects your chance of getting a disease such as cancer. Different cancers have different risk factors. For example, exposing skin to strong sunlight is a risk factor for skin cancer. Smoking is a risk factor for many cancers.

But risk factors don't tell us everything. Having a risk factor, or even several, does not mean that you will get the disease. On the other hand, some men who develop penile cancer have no known risk factors. Even if a man does have one or more risk factors for penile cancer, it is impossible to know for sure how much that risk factor may have contributed to causing his cancer.

Scientists have found certain risk factors that make a man more likely to develop penile cancer.

Not being circumcised

Circumcision is the removal of all (or a part) of the foreskin. This procedure is most often done in infants but it can be done later in life. Circumcision seems to protect against penile cancer when it is done shortly after birth. Men who were circumcised as babies have a lower chance of getting penile cancer than those who were not.

The reasons for this are not entirely clear, but may be related to other known risk factors. For example, men who are circumcised cannot develop a condition called phimosis (see below). Men with phimosis have an increased risk of penile cancer. Also, circumcised men seem to be less likely to be infected with the human papillomavirus (HPV), even after adjusting for differences in sexual behavior.

In weighing the risks and benefits of circumcision, doctors consider the fact that penile cancer is very uncommon in the United States, even among uncircumcised men. Neither the

American Academy of Pediatrics nor the Canadian Academy of Pediatrics recommends routine circumcision of newborns just for medical reasons. In the end, decisions about circumcision are highly personal and depend more on social and religious factors than on medical evidence.

Circumcision reduces the risk of penile cancer if it is done shortly after birth, but removing the foreskin later (as an adult) does not lower this risk. Adult men can lower their risk of penile cancer by avoiding things that are known to raise the risk of penile cancer. These factors are discussed in more detail later below.

Phimosis and smegma

Uncircumcised men with certain conditions may be at higher risk for penile cancer.

Phimosis

In men who are not circumcised, the foreskin can sometimes become tight and difficult to retract. This condition is known as *phimosis*. Penile cancer is more common in men with phimosis. Since the foreskin is hard to retract, someone with phimosis may have trouble cleaning the entire penis well. This can lead to the build up of secretions, leading to *smegma*.

Smegma

Sometimes secretions can build up underneath the intact foreskin. If the area under the foreskin isn't cleaned well, this build up can get worse and eventually result in something called *smegma*. Smegma is a thick, sometimes smelly substance found under the foreskin. It is made up of oily secretions from the skin, along with dead skin cells and bacteria.

It hasn't been proven, but some experts are concerned that smegma may also contain compounds that can cause cancer. Some older studies have suggested a link between smegma and penile cancer. Smegma probably doesn't cause penile cancer by itself, but it can cause the penis to become irritated and inflamed, and may make it harder to see very early cancers. Men can prevent smegma from building up simply by washing the penis with the foreskin retracted.

Human papillomavirus infection

Human papillomavirus (HPV) is a group of more than 100 related viruses. They are called papilloma viruses because some of them cause a type of growth called a *papilloma*. Papillomas are not cancers, and are more commonly called warts. Different HPV types cause different types of warts in various parts of the body. Some types cause common warts on the hands and feet. Other types tend to cause warts on the lips or tongue.

HPV infection is found in about half of all penile cancers. It's not clear exactly what role HPV may play in the development of penile cancer, but some researchers believe that infection with HPV may be a risk factor for penile cancer.

HPV is the major cause of cancer of the cervix in women and may cause some cancers of the anus in men and women. It may also cause some cancers of the vagina and vulva in women as well as throat cancers (in men and women). HPV is passed from one person to another during skin-to-skin contact. HPV can be spread during sex -- including vaginal intercourse, anal intercourse, and even during oral sex. Certain factors can increase a person's risk of HPV infection, such as:

- starting to have sex at an early age
- having many sexual partners
- having sex with a partner who has had many other partners
- having unprotected sex (not using a condom)

When HPV infects the skin of the external (outer) genital organs and anal area, it often causes raised, bumpy warts. These warts are called genital warts or *condyloma acuminatum*. They can range in size from being almost too small to see to being several inches across. HPV 6 and HPV 11 cause most cases of genital warts. Because these warts rarely turn into cancer, HPV 6 and HPV 11 are called "low-risk" types of HPV. Some other HPV types are more likely to cause cancer and so are called "high-risk." They include HPV 16 and HPV 18, which cause most cases of cervical cancer, as well as some others like HPV 33, HPV 35, and HPV 45.

Smoking

Men who smoke are more likely to develop penile cancer than those who do not smoke. Smokers who have HPV infections have an even higher risk. Smoking exposes your body to many cancer-causing chemicals. These harmful substances are inhaled into the lungs, where they are absorbed into the blood. While in the bloodstream, they can travel throughout the body to cause cancer in many different areas. Researchers believe that these substances damage the DNA of cells in the penis, which can lead to the development of penile cancer.

UV light treatment of psoriasis

Men who have a skin disease called psoriasis are sometimes treated with drugs called psoralens, followed by exposure of the body to an ultraviolet A (UVA) light source. This is known as PUVA therapy. Men who have received this treatment have been found to have a higher rate of penile cancer. Because of this risk, men being treated with PUVA now have their genitals covered during treatment.

Age

The risk of penile cancer goes up with age. About 4 out of 5 cases of the disease are diagnosed in men over age 55.

AIDS

Men with AIDS (*acquired immunodeficiency syndrome*) have a higher risk of penile cancer. This higher risk seems to be related to their lowered immune response, but lifestyle factors may also play a role. In some studies, men with penile cancer who were HIV-positive were more likely to smoke and to be infected with HPV than HIV-negative men with penile cancer.

Do we know what causes penile cancer?

The exact cause of most penile cancers is not known. However, scientists have found that the disease is associated with a number of other conditions (described in the section, "What are the risk factors for penile cancer?"). A great deal of research is now under way to learn more about how these risk factors cause cells of the penis to become cancerous.

For example, research has shown that normal cells make substances called *tumor suppressor gene products* to keep them from growing too fast and becoming cancers. Two proteins (E6 and E7) made by high-risk types of human papillomavirus (HPV) can block the function of tumor suppressor gene products in cells, which may make them more likely to become cancerous.

Smoking produces cancer-causing chemicals that spread throughout the body and can damage the DNA of cells of the penis. (DNA is the chemical in each of our cells that makes up our genes -- the instructions for how our cells grow and divide.) DNA damage affecting genes that regulate cell growth can contribute to the development of cancer.

Can penile cancer be prevented?

The large variations in penile cancer rates throughout the world strongly suggest that penile cancer is a preventable disease. The best way to reduce the risk of penile cancer is to avoid known risk factors whenever possible (see the section, "What are the risk factors for penile cancer?").

In the past, circumcision has been suggested as a way to prevent penile cancer. This was based on studies that reported much lower penile cancer rates among circumcised men than among uncircumcised men. But most researchers now believe those studies were flawed because they failed to consider other risk factors, such as smoking, personal hygiene, and the number of sexual partners.

Most public health researchers believe that the risk of penile cancer is low among uncircumcised men without known risk factors living in the United States. Most experts agree that circumcision should not be recommended solely as a way to prevent penile cancer.

Genital hygiene

Perhaps the most important factor in preventing penile cancer in uncircumcised men is good genital hygiene. Uncircumcised men need to retract the foreskin and clean the entire penis. If the foreskin is constricted and difficult to retract, a doctor may be able to cut the skin through a procedure called a *dorsal slit* to make retraction easier.

Avoiding HPV infection

All men should do what they can to avoid infection with the human papillomavirus (HPV). In addition to decreasing penile cancer risk, this could have an even bigger impact on the risk of cervical cancer in female partners.

Delaying sex until you are older can help you avoid HPV infection. It also helps to limit your number of sexual partners and avoid having sex with someone who has had many other sexual partners.

Using condoms ("rubbers") can lower the chance of HPV infection, but they cannot completely prevent infection. This is because HPV can be passed from one person to another by skin-to-skin contact with an HPV-infected area of the body that is not covered by a condom -- like the skin in the genital or anal area. Still, it is important to use condoms to help protect against AIDS and other sexually transmitted diseases that are passed on through some body fluids.

Infection with HPV can be present for years without any symptoms; so the absence of visible warts cannot be used to tell if someone has HPV. Even when someone doesn't have warts (or any other symptom), he (or she) can still be infected with HPV and pass the virus to somebody else.

Vaccines have been developed to help prevent infection with some types of HPV. Gardasil[®] protects against HPV types 6 and 11, which can cause genital warts, and types 16 and 18, which cause some types of cancer. It is currently approved for use in young females and males. Another vaccine, Cervarix[®], protects against HPV types 16 and 18 and is approved for use only in young females. The vaccines work best if given before the person starts having

sex (and is exposed to HPV). The hope is that HPV vaccines may eventually help reduce the risk of cancers linked to HPV, including penile cancers.

Not smoking

Smoking also increases penile cancer risk. It can also cause other more common cancers, as well as serious conditions such as heart disease and stroke. Quitting smoking or never starting in the first place is a good way to reduce your risk of many diseases, including penile cancer.

Some men with penile cancer have no known risk factors, so it is not possible to completely prevent this disease.

Can penile cancer be found early?

There are no widely recommended screening tests for penile cancer, but many cases can be found early.

Almost all penile cancers start in the skin, so they may be noticed early in the course of the disease. Cancers that start under the foreskin may not be seen as quickly, especially if phimosis (constriction of the foreskin) is present. Some penile cancers may cause symptoms that appear to be due to a disease other than cancer.

Even if a man sees or feels something abnormal, he may not recognize it as something that needs medical attention right away. You should see a doctor if you find a new growth or other abnormality of your penis, even if it is not painful. Things like warts, blisters, sores, ulcers, white patches, or other abnormal areas need to be looked at by a doctor. Most are not cancerous, but they may be caused by an infection or some other condition that needs to be treated.

Unfortunately, some men avoid going to the doctor for lesions (abnormalities) on their penis. Many men with penile lesions delay seeking treatment for a year or more after they first notice the problem.

If a cancer is found early, it can often be removed with little or no damage to the penis. If it is not diagnosed until later, part or all of the penis may need to be removed to treat the cancer. It is also more likely to require other, more invasive treatments, and may even be life threatening.

How is penile cancer diagnosed?

Certain signs and symptoms might suggest that a man may have penile cancer, but tests are needed to confirm the diagnosis.

Signs and symptoms of penile cancer

In most cases, the first sign of penile cancer is a change in the skin of the penis. The skin may change color, become thicker, or tissue may build up in one area. Some men may notice an ulcer (sore) or a lump on the penis. These are most likely to be found on the glans (the head of the penis) or foreskin, but may also develop on the shaft. The sore or lump is not usually painful, but it can be in some cases.

Sometimes the cancer appears as a reddish, velvety rash, small crusty bumps, or flat growths that are bluish-brown. It may not be visible unless the foreskin is pulled back. A persistent discharge (drainage), often with a bad smell, may also be present beneath the foreskin.

Swelling at the end of the penis, especially when the foreskin is constricted, is another common sign that penile cancer may be present.

If the cancer spreads from the penis, it most often travels first to lymph nodes in the groin. This can cause those lymph nodes to become swollen. Lymph nodes are bean-sized collections of immune system cells that fight infection. Normally, they can barely be felt at all. If they are swollen, the lymph nodes may be easy to feel as lumps under the skin.

These signs and symptoms don't always mean cancer -- they can also be caused by benign conditions. For example, infection can cause swollen lymph nodes in the groin area. Still, if you have any of these signs or symptoms, go see your doctor right away. Remember, the sooner you receive a correct diagnosis, the sooner you can start treatment and the more effective your treatment is likely to be.

Medical history and physical exam

If you have symptoms that suggest you might have penile cancer, your doctor will want to take a complete medical history to get details about your symptoms and any possible risk factors you may have.

Your doctor will also look at the genital region carefully for possible signs of penile cancer or other health problems. Penile lesions usually affect the skin on the surface of the penis, so a doctor often can find cancers and other abnormalities by looking closely at the penis.

If symptoms and/or the results of the physical exam suggest you may have penile cancer, other tests will likely be done. These might include a biopsy and imaging tests.

Biopsy procedures

A biopsy is needed to make an accurate diagnosis of cancer. In this procedure, a small piece of the abnormal tissue is cut out and sent to a pathologist (a doctor specializing in laboratory diagnosis of diseases), who looks at the tissue under a microscope to see whether cancer cells are present. The results are usually available within a few days, but may take longer in some cases.

The type of biopsy used depends on the nature of the abnormality.

Incisional biopsy

For an incisional biopsy only a part of the abnormal tissue is removed. This type of biopsy is often done for lesions that are larger, are ulcerated (the top layer of skin is missing or the lesion appears as a sore), or that appear to grow deeply into the tissue.

These biopsies are usually done in a doctor's office, clinic, or outpatient surgical center with local anesthesia (numbing medicine).

Excisional biopsy

In an excisional biopsy, the entire lesion is removed. This type of biopsy is more commonly used if the abnormal area is small, such as a nodule (swollen lump) or plaque (raised, flat area) that is 1 cm (about 3/8 inch) or less in size. If the abnormal area is only on the foreskin, your doctor may recommend a circumcision as a form of excisional biopsy to remove the lesion completely.

These biopsies are usually done in a doctor's office, clinic, or outpatient surgical center with local anesthesia (numbing medicine).

Fine needle aspiration

For a fine needle aspiration (FNA) the doctor places a thin, hollow needle directly into the abnormal area for about 10 seconds and withdraws cells and a few drops of fluid. This type of biopsy is often done to see if enlarged lymph nodes contain cancer. It is not used to sample lesions on the penis itself.

If anesthesia is needed, local anesthesia may be injected into the skin over the mass to numb the area. This procedure can be done in a doctor's office or clinic.

If the enlarged lymph node is deep inside your body and the doctor cannot feel it, imaging methods such as ultrasound or CT scans can be used to guide the needle into the node.

FNA is not used in every case, but it is one alternative to a more extensive procedure, called a lymph node dissection, for some patients.

Surgery to check lymph nodes

Patients with cancers that have invaded deep within the penis usually need to have nearby lymph nodes checked for cancer spread. This is done to help determine the stage (extent) of the cancer after the diagnosis has been made.

If the biopsy is not done with FNA, it will require some type of surgery. These surgical lymph node biopsies are described in the section, "How is penile cancer treated?"

Imaging tests

Imaging tests use x-rays, magnetic fields, or sound waves to create pictures of the inside of your body. They are generally not useful in men with early penile cancer. If the doctor thinks the cancer is advanced or has spread, then one or more of these tests may be ordered.

Computed tomography (CT)

The CT scan is an x-ray procedure that produces detailed cross-sectional images of your body. Instead of taking one picture, like a conventional x-ray, a CT scanner takes many pictures as it rotates around you while you are lying on a narrow platform. A computer then combines these pictures into images of slices of the part of your body that is being studied.

CT scans are helpful in staging the cancer. They help tell if your cancer has spread into your lungs, liver, or other organs.

Prior to the scan, you may be asked to drink a contrast solution and/or get an intravenous (IV) injection of a contrast dye that helps better outline abnormal areas in the body. The injection can cause some flushing (redness and warm feeling). A few people are allergic to the dye and get hives or, rarely, more serious reactions like trouble breathing and low blood pressure. Medicine can be given to help prevent and treat allergic reactions. Be sure to tell the doctor if you have ever had a reaction to any contrast material used for x-rays or if you have an allergy to shellfish.

CT scans take longer than regular x-rays. You need to lie still on a table while they are being done. During the test, the table moves in and out of the scanner, a ring-shaped machine that completely surrounds the table. You might feel a bit confined by the ring you have to lie in while the pictures are being taken.

Spiral CT (also known as helical CT) is now available in many medical centers. This type of CT scan uses a faster machine. The scanner part of the machine rotates around the body continuously, creating the images much more quickly than standard CT. This lowers the chance of blurred images. It also lowers the dose of radiation received during the test. The slices it images are thinner, which yields more detailed pictures.

CT scans can also be used to guide a biopsy needle precisely into a suspected metastasis. For this procedure, called a *CT-guided needle biopsy*, you remain on the CT scanning table while a radiologist advances a biopsy needle through the skin and toward the location of the mass. CT scans are repeated until the needle is within the mass. A biopsy sample is then removed and sent to be looked at under a microscope.

Magnetic resonance imaging (MRI)

Like CT scans, MRI scans provide detailed images of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. The energy from the radio waves is absorbed and then released in a pattern formed by the type of tissue and by certain diseases. A computer translates the pattern of radio waves given off by the tissues into a very detailed image of parts of the body. A contrast material might be injected just as with CT scans but is used less often.

MRI scans are most helpful in looking at the brain and spinal cord. When they are used to look at penile tumors, the pictures are better if the penis is erect. The doctor can inject a substance called prostaglandin into the penis to make it erect.

MRI scans are a little more uncomfortable than CT scans. First, they take longer -- often up to an hour. You may be placed inside a large, narrow tube, which can upset people with a fear of enclosed spaces. Newer, more open MRI machines can sometimes help with this if needed. The MRI machine makes buzzing and clicking noises that you may find disturbing. Some places will provide earplugs to help block this out.

Ultrasound

This test uses sound waves and their echoes to produce a picture of internal organs or masses. A small microphone-like instrument called a transducer emits sound waves and picks up the echoes as they bounce off body tissues. The echoes are converted by a computer into a black and white image that is displayed on a computer screen.

This test is painless and does not expose you to radiation. For most ultrasound exams, the skin is first lubricated with gel. Then a technician moves the transducer over the skin above the part of your body being examined.

Ultrasound may be useful for determining how deeply the cancer has penetrated into the penis. It can also spot enlarged lymph nodes in the groin.

How is penile cancer staged?

Staging is the process of finding out how far a cancer has spread. Once penile cancer is diagnosed, your doctor will determine the stage of the cancer using the results of exams, biopsies, and any imaging tests you have had. (These were described in the section, "How is penile cancer diagnosed?") The stage of your cancer is a very important factor in planning your treatment and estimating your prognosis (outlook).

If you have penile cancer, ask your cancer care team to explain staging in a way that you can understand. Knowing all you can about staging will let you take a more active role in making informed decisions about your treatment.

The American Joint Committee on Cancer (AJCC) TNM system

A staging system is a standardized way for the cancer care team to summarize information about how far a cancer has spread. The most common system used to describe the stages of squamous cell penile cancers is the American Joint Committee on Cancer (AJCC) TNM system. This system is based on 3 key pieces of information:

- **T** stands for **tumor** (how far it has spread within the penis and to nearby organs).
- **N** stands for spread to nearby lymph **nodes** (bean-sized collections of immune system cells that help fight infections and cancers).
- **M** is for **metastasis** (spread to distant organs).

Additional letters or numbers appear after T, N, and M to provide more details about each of these factors. The numbers 0 through 4 indicate increasing severity. The letter X means "cannot be assessed because the information is not available." The letters "is" after the T stand for "in situ," which means the cancer is only in the top layers of skin and has not yet invaded (grown into) a deeper layer of tissue. The type of staging described here is known as surgical or pathologic staging. This type of staging is based on the results of biopsies and the findings at surgery. Penile cancer can also be clinically staged. Clinical staging is based on the results of a physical exam and imaging studies (such as CT scans).

Another factor that can affect staging is the grade of the cancer. The grade is a measure of how abnormal the cancer cells appear when they are examined under a microscope. The grade can be expressed as a number, from 1 to 4. The higher the number, the more abnormal the cells look. Higher grade cancers tend to grow and spread more quickly than lower grade cancers.

T categories:

TX: Primary tumor cannot be assessed

T0: No evidence of primary tumor

Tis: Carcinoma in situ (cancer that is only in the top layers of skin)

Ta: Verrucous (wart-like) carcinoma that is only in the top layers of skin

T1: Tumor has grown into the tissue below the top layers of skin (called the subepithelial connective tissue)

T1a: The cancer has grown into the subepithelial connective tissue, but it has not grown into blood or lymph vessels. The cancer is grade 1 or 2.

T1b: The cancer has grown into the subepithelial connective tissue and either it has grown into blood and lymph vessels OR it is high-grade (grade 3 or 4).

T2: Tumor has grown into one of the internal chambers of the penis (the corpus spongiosum or corpora cavernosum)

T3: Tumor has grown into the urethra (the tube that carries urine and semen outside of the body)

T4: Tumor has grown into the prostate or other nearby structures

N categories

NX: Nearby lymph nodes cannot be assessed

N0: No spread to nearby lymph nodes

N1: The cancer has spread to a single lymph node in the groin (inguinal lymph node)

N2: The cancer has spread to more than 1 inguinal lymph node

N3: The cancer has spread to lymph nodes in the pelvis and/or the cancer in the lymph nodes has grown through the outer covering of the lymph node and into the surrounding tissue

M categories

MX: Cannot tell if the cancer has spread to distant organs or tissues

M0: The cancer has not spread to distant organs or tissues

M1: The cancer has spread to distant organs or tissues (such as lymph nodes outside of the pelvis, lungs, or liver)

Using the TNM system, a doctor might describe one case of penile cancer as T2, N0, M0 and another as T4, N1, M0.

Stage groupings

To summarize this information, TNM combinations are grouped together into a simpler set of stages, labeled stage 0 through stage IV. This is known as stage grouping.

Stage 0: Tis or Ta, N0, M0:

The cancer has not grown into tissue below the top layers of skin and has not spread to lymph nodes or distant sites.

Stage I: T1a, N0, M0:

The cancer has grown into tissue just below the superficial layer of skin but has not grown into blood or lymph vessels. It is a grade 1 or 2. It has not spread to lymph nodes or distant sites.

Stage II Any of the following:

T1b, N0, M0: The cancer has grown into tissue just below the superficial layer of skin and is either high-grade or has grown into blood or lymph vessels. It has not spread to lymph nodes or distant sites

OR

T2, N0, M0: The cancer has grown into one of the internal chambers of the penis (the corpus spongiosum or corpora cavernosum). The cancer has not spread to lymph nodes or distant sites.

OR

T3, N0, M0: The cancer has grown into the urethra. It has not spread to lymph nodes or distant sites.

Stage IIIa: T1 to T3, N1, M0:

The cancer has grown into tissue below the superficial layer of skin (T1). It may also have grown into the corpus spongiosum, the corpus cavernosum, or the urethra (T2 or T3). The cancer has spread to a single groin lymph node (N1). It has not spread to distant sites.

Stage IIIb: T1 to T3, N2, M0:

The cancer has grown into the tissues of the penis and may have grown into the corpus spongiosum, the corpus cavernosum, or the urethra (T1 to T3). It has spread to 2 or more groin lymph nodes. It has not spread to distant sites

Stage IV: Any of the following:

T4, any N, M0: The cancer has grown into the prostate or other nearby structures. It may or may not have spread to groin lymph nodes. It has not spread to distant sites.

OR

Any T, N3, M0: The cancer has spread to lymph nodes in the pelvis OR the cancer spread in the groin lymph nodes has grown through the lymph nodes' outer covering and into the surrounding tissue. The cancer has not spread to distant sites.

OR

Any T, any N, M1: the cancer has spread to distant sites.

Recurrent cancer

Recurrent disease means that the cancer went away with treatment, but then later came back. Recurrent penile cancer may return in the penis or in any other part of the body. This isn't a formal stage of the TNM system, but a doctor may note it by putting a small 'r' in front of the stage (for example, rT2N1M0).

Survival rates for penile cancer

Survival rates are a way for doctors and patients to get a general idea of the outlook for people with a certain type and stage of cancer. Some people want to know the statistics for people in their situation, while others may not find them helpful, or may even not want to know them. Whether or not you want to read about the survival statistics below for penile cancer is up to you.

Survival rates are typically based on previous outcomes of large numbers of people who had the disease, but they cannot predict what will happen in any particular person's case. Many other factors may affect a person's outlook, such as a person's age and general health, and how well the cancer responds to treatment. Your doctor can tell you if the numbers below may apply to you, as he or she is familiar with the aspects of your particular situation.

The 5-year survival rate is the percentage of patients who live *at least* five years after their cancer is diagnosed. Many of these patients live much longer than five years, but 5-year rates

are used to produce a standard way of discussing prognosis (outlook). *Relative* survival rates compare the survival of people with the cancer to the survival for people without the cancer. Since some people will die of causes other than cancer, this is a way to look only at deaths from the cancer in question. The 5-year relative survival rate is a more accurate way to describe the outlook for patients with a particular type and stage of cancer.

Because penile cancer is not common, it is hard to find accurate survival rates based on the TNM stage of the cancer. The numbers below come from the National Cancer Institute's SEER database, looking at more than 1,000 men diagnosed with penile cancer between 1988 and 2001. These men were diagnosed at least several years ago, so men now being diagnosed may have a better outlook.

- For cancers that are still confined to the penis, the 5-year relative survival rate is around 85%.
- If the cancer has spread to nearby tissues or lymph nodes, the 5-year relative survival rate is around 59%.
- If the cancer has spread to distant parts of the body, 5-year relative survival rate is about 11%.

How is penile 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.

In recent years, much progress has been made in treating penile cancer. New medicines or ways to use medicines have been developed. Surgical methods involving microscopic techniques and lasers have been refined, and more is known about the best way to use radiation.

Making treatment decisions

After the cancer is found and staged, your cancer care team will discuss treatment options with you. You should take time and think about all of your choices. In choosing a treatment plan, factors to consider include:

- the type and stage of your cancer
- your overall physical health
- your personal preferences about treatments and their side effects

If time permits, it is often a good idea to seek a second opinion. A second opinion can provide more information and help you feel more confident about the treatment plan you have chosen. Some insurance companies even require a second opinion before they will agree to pay for certain treatments.

The main types of treatments that can be used to treat penile cancers are:

- surgery
- radiation therapy
- chemotherapy

Surgery is the main method of treatment for nearly all penile cancers, but sometimes radiation therapy may be used, either instead of or in addition to surgery. Chemotherapy may be given if the cancer has spread.

The goal of your cancer care team is to treat the cancer effectively while limiting the treatment's effects on the function and appearance of the penis. If the cancer can't be cured, the goal may be to remove or destroy as much of the cancer as possible and to prevent the tumor from growing, spreading, or returning for as long as possible. Sometimes treatment is aimed at relieving symptoms, such as pain or bleeding, even if you won't be cured.

Surgery

Surgery is the most common treatment for all stages of penile cancer. If the cancer is detected early, then the tumor can often be treated without having to remove part of the penis. If the cancer is detected at a more advanced stage, part or all of the penis might have to be removed with the tumor. Your team will discuss with you the treatment options that give you the best chance of curing your cancer while preserving as much of the penis as possible.

Patients with cancers that have invaded deep within the penis (stage T2 or higher) usually need to have some nearby lymph nodes removed as well to check for cancer spread. Instead of removing all of the groin lymph nodes to look for cancer, some doctors prefer to do a sentinel lymph node biopsy, which is discussed later in this section.

Several different kinds of surgery are used to treat penile cancers.

Circumcision

This operation removes the foreskin and some nearby skin. This method can often cure cancers that are limited to the foreskin.

Circumcision is also done to remove the foreskin before radiation therapy to the penis. Radiation can cause swelling and constriction of the foreskin, which could lead to other problems.

Simple excision

In this operation, the tumor is cut out with a surgical knife, along with some surrounding normal skin. If the tumor is small, the remaining skin can then be stitched back together. This is the same as an excisional biopsy.

In a *wide local excision*, the cancer is removed along with a large amount of normal tissue around it (called *wide margins*). Removing healthy tissue makes it less likely that any cancer cells are left behind. If not enough skin remains to cover the area, a skin graft may be taken from another part of the body and placed over the area.

Mohs surgery (microscopically-controlled surgery)

Using the Mohs technique, the surgeon removes a layer of the skin that the tumor may have invaded and then checks the sample under a microscope right away. If it contains cancer, another layer is removed and examined. This process is repeated until the skin samples are found to be free of cancer cells.

This process is slow, but it means that more normal tissue near the tumor can be saved. This creates a better appearance and function after surgery. This is a highly specialized technique that should be used only by doctors who have been trained in this specific type of surgery. It is used for pre-cancerous conditions and for some cancers that have not invaded deeply into the penis.

Laser surgery

This approach uses a beam of laser light to vaporize cancer cells. It is useful for squamous cell carcinoma in situ (involving only the outer layer of the skin) and for very thin or shallow basal cell cancers.

Partial or total penectomy

This operation removes part or all of the penis. It is the most common and most effective way to treat a penile cancer that has grown deeply inside the penis. The goal is to remove all of the cancer. To do this the surgeon needs to remove some of the normal looking penis as well. The surgeon will try to leave as much of the shaft as possible.

The operation is called a *partial penectomy* if only the end of the penis is removed (and some shaft remains).

If not enough of the shaft can be saved for the person to urinate standing upright without dribbling, a *total penectomy* will be done. This operation removes the entire penis, including the roots that extend into the pelvis. The surgeon creates a new opening for urine to drain from the perineum, which is the area between the scrotum (sac for the testicles) and the anus. This is known as a perineal urethrostomy. Urination can still be controlled because the sphincter (the "on-off" valve) in the urethra is left behind, but the man will have to sit down to urinate.

This operation can affect a man's self image, as well as his ability to have sexual intercourse. For more information, see the section, "What happens after treatment?"

Surgery to remove lymph nodes

Patients with cancers that have invaded deep within the penis (stage T2 or higher) usually need to have some nearby lymph nodes removed to check for cancer spread.

Sentinel lymph node biopsy: This operation can sometimes help the surgeon to see if the groin lymph nodes contain cancer without having to remove all of them. It is most often done when lymph nodes are not enlarged but there is a chance that the cancer may have reached them.

The surgeon finds the first lymph node that drains the tumor (called the sentinel node) and removes it. If the cancer has spread outside of the penis, this lymph node is the one most likely to contain cancer cells. If the sentinel node contains cancer, a more extensive operation, known as a lymph node dissection or inguinal lymphadenectomy, is done (see below). If the sentinel node does not have cancer cells, the surgeon doesn't have to remove any more lymph nodes.

To find the right lymph node, a radioactive tracer is injected into the region around the tumor the day before surgery. A radiation detection device is used to determine whether the lymphatic channels around the cancer drain into the left groin or right groin. This tells the doctor which side is likely to contain cancer if it has spread. On the day of surgery, a blue dye is injected into the region of the tumor.

The lymphatic vessels will carry the dye and radioactive material to the sentinel node. The surgeon finds this node during the operation either visually (by the blue dye) or with a Geiger counter (radiation detector) and removes it.

Using this approach, fewer patients need to have as many lymph nodes removed. The more lymph nodes that are removed, the higher the risk of side effects such as lymphedema (swelling in the groin and legs caused by the buildup of fluid) and problems with wound healing.

Not all doctors agree on how useful this type of operation is for penile cancer, and some prefer to remove more lymph nodes up front with an inguinal lymphadenectomy. If your

doctor is considering a sentinel lymph node biopsy, it might be useful to determine how many sentinel node biopsies he/she has done. Experience is very important. Discuss the procedure with your doctor.

Inguinal lymphadenectomy (groin lymph node dissection): Many men with penile cancer have swollen groin lymph nodes at the time of diagnosis. These lymph nodes only need to be removed if they contain cancer cells. About half of the time, the swelling is from infection or inflammation -- not from cancer. If the lymph nodes are swollen, doctors routinely give a course of antibiotics and wait 4 to 6 weeks after the main penile tumor is removed. If the swelling doesn't go away with time, then a second operation, called an inguinal lymphadenectomy, is done to remove the lymph nodes.

This operation may also be done if cancer is found during a sentinel lymph node biopsy.

In this procedure, the surgeon makes a 4-inch incision in your groin and carefully removes the tissues containing lymph nodes. This must be done with care because important muscles, nerves, and blood vessels run through this area. The nodes are then sent to a lab, where a pathologist looks at them under a microscope to see if they contain cancer.

The lymph nodes are part of the system that normally helps excess fluid drain out of the legs and back into the bloodstream. Removing many lymph nodes in an area can lead to abnormal swelling from problems with fluid drainage. This condition is called *lymphedema*. In the past, this was a common problem after treatment for penile cancer because the lymph nodes from groin areas on both sides were removed to check for cancer spread. Up to half of the patients who had this surgery went on to develop severe lymphedema in both legs. Now this operation is only done when there is a good chance that the cancer has spread. If the sentinel lymph node is removed first, the doctor may be able to avoid doing an inguinal lymphadenectomy. Still, lymphedema can occur even when the lymph nodes from only one groin area are removed.

Radiation therapy

Radiation therapy uses high-energy rays or particles to destroy cancer cells. It can be used to treat some early stage penile cancers instead of surgery. In cases where cancer has reached several lymph nodes, radiation may be used along with surgery to remove lymph nodes to try to reduce the risk the cancer will come back. Radiation may also be used for advanced cancers to try to slow the growth of the cancer or to relieve symptoms caused by the cancer.

For uncircumcised men who are going to get radiation to the penis, circumcision is done first to remove the foreskin. This is because radiation can cause swelling and constriction of the foreskin, which could lead to other problems.

There are 2 main ways to get radiation therapy.

External beam radiation therapy

The most common way to get radiation therapy is from carefully focused beams of radiation aimed at the tumor from a machine outside the body. The treatment is much like getting an x-ray, but the radiation is more intense. The procedure itself is painless. Each treatment lasts only a few minutes, but the setup time -- getting you into place for treatment -- usually takes longer. Treatments are usually given 5 days a week for a period of 6 weeks or so.

Brachytherapy

For brachytherapy, a radioactive source is placed into or right next to the penile tumor. The radiation travels only a short distance, so nearby healthy tissues don't get much radiation. This type of treatment is done while you are in the hospital. There are 2 ways to get brachytherapy for penile cancer.

In one method, known as *interstitial radiation*, hollow needles are first placed into the penis in the operating room. Then tiny pellets of radioactive materials are put into the needles to treat the tumor. The pellets are kept in place for several days while they release their radiation. After the treatment is over, the needles are removed.

Another type of brachytherapy involves putting the radiation source close to (but not into) the tumor. This is called *plesiobrachytherapy*. In this method, a plastic cylinder is placed around the penis and then another cylinder with a radiation source is placed on top of the first cylinder. Another way to do this is to make a sponge-like mold of the penis and put the radioactive material into hollowed-out spaces in the mold. Treatment is usually done for several days in a row.

Possible side effects of radiation therapy

The main drawback of radiation therapy is that it can destroy or damage nearby healthy tissue along with the cancer cells. Many men have side effects such as swelling, redness, and sensitivity. The skin in the treated area may have patches that are oozing and tender. For some, the skin may even peel. For a while, you may feel a burning sensation when you urinate.

Patients treated with brachytherapy will find their side effects tend to be worse 1 to 2 weeks after the treatment is finished. If external beam radiation is used, the side effects tend to occur during treatment and then improve after radiation is stopped. Most symptoms go away in 1 to 2 months. Over time, men treated with radiation may notice the skin of the penis has become darker or less elastic. Tiny web-like blood vessels (called *telangiectasia*) may be visible. Some more serious side effects can include:

- destruction (necrosis) of some of the skin or tissue at the end of the penis
- problems urinating due to narrowing (stenosis) of the urethra from scar tissue
- development of an abnormal opening (fistula) between the urethra and skin

In many cases, the function and appearance of the penis gradually return to normal in the months and years after radiation therapy. In cases where the tumor has not grown beyond the glans, radiation is directed only at the tip of the penis, so the ability to achieve erections should not be affected.

Possible side effects of radiation to the pelvic area and groin lymph nodes include tiredness, nausea, or diarrhea.

Chemotherapy

Chemotherapy (often called *chemo*) is the use of drugs to treat cancer. Two types of chemotherapy that may be used in treating penile cancer are topical chemotherapy and systemic chemotherapy.

Topical chemotherapy

Topical chemotherapy means that an anti-cancer medicine is placed directly onto the skin instead of being taken as a pill or injected into a vein. The drug most often used in topical treatment of penile cancer is 5-fluorouracil (5-FU), which is applied daily for several weeks.

When applied directly onto the skin in the form of a cream, 5-FU reaches cancer cells near the skin surface but cannot reach cancer cells that have invaded deeply into the skin or spread to other organs. For this reason, treatment with 5-FU generally is used only for pre-cancerous conditions or carcinoma in situ (Tis, stage 0).

Because the drug does not spread throughout the body, the side effects that often occur with systemic chemotherapy do not occur with topical chemotherapy. Treatment with 5-FU cream causes the treated skin to become red and very sensitive for a few weeks. Use of other topical medicines or creams can help relieve this.

Systemic chemotherapy

Systemic chemotherapy uses anti-cancer drugs that are injected into a vein or given by mouth. These drugs enter the bloodstream to reach cancer cells in all areas of the body. This treatment is useful for cancers that have spread to lymph nodes or distant organs. Chemotherapy can also be used to shrink cancers before surgery to make them easier to remove. It is also being studied to see if giving it after surgery will keep the cancer from coming back and improve survival.

Doctors give chemotherapy in cycles, with each period of treatment followed by a rest period to allow the body time to recover. Chemotherapy cycles generally last about 3 to 4 weeks. One or more chemotherapy drugs may be used to treat penile cancer that has spread to other organs. Some of the drugs most commonly used to treat penile cancer include:

- cisplatin
- fluorouracil (5-FU)
- vincristine
- methotrexate
- bleomycin

Possible side effects: Chemotherapy drugs work by attacking cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, such as those in the bone marrow, the lining of the mouth and intestines, and the hair follicles, also divide quickly. These cells are also likely to be affected by chemotherapy, which can lead to side effects.

The side effects of chemotherapy depend on the type and dose of drugs you are given and how long they are used. These side effects can include:

- hair loss
- mouth sores
- loss of appetite
- nausea and vomiting
- increased chance of infections (due to low white blood cell counts)
- easy bruising or bleeding (due to low blood platelet counts)
- fatigue (due to low red blood cell counts)

These side effects are usually short-term and go away after treatment is finished. There are often ways to lessen these side effects. For example, there are drugs that can be given to help prevent or reduce nausea and vomiting. Be sure to ask your doctor or nurse about medicines to help reduce side effects, and let him or her know when you do have side effects so they can be managed effectively.

Some of the drugs used to treat penile cancer can have specific side effects.

- Cisplatin can cause nerve damage (neuropathy) and kidney damage (nephropathy). The nerve damage can cause problems with numbness and tingling in the hands and feet. Doctors give a lot of intravenous (IV) fluid with cisplatin to help prevent the kidney damage.
- 5-fluorouracil (5-FU) can cause sores in the mouth (mucositis) that can make it hard to eat. This drug can also cause diarrhea.
- Vincristine can cause nerve damage.
- A rare side effect of bleomycin is lung damage, which can lead to problems breathing.

Immune therapy

Imiquimod is a drug that boosts the body's immune system. It is available as a cream that is placed directly on the skin. It is sometimes used to treat carcinoma in situ of the penis.

Clinical trials

You may have had to make a lot of decisions since you've been told you have cancer. One of the most important decisions you will make is choosing 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 <http://clinicaltrials.cancer.org>. You can also get a list of current clinical trials by calling the National Cancer Institute's Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials Web site at www.cancer.gov/clinicaltrials.

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

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

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

Complementary and alternative therapies

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

What exactly are complementary and alternative therapies?

Not everyone uses these terms the same way, and they are used to refer to many different methods, so it can be confusing. 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 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 have even been found 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 pose danger, or have life-threatening side effects. But the biggest danger in most cases is that you may lose the chance to be helped by standard medical treatment. Delays or interruptions in your medical treatments may give the cancer more time to grow and make it less likely that treatment will help.

Finding out more

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

As you consider 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 about 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 always 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.

Treatment options by stage

The type of treatment your cancer care team will recommend depends on how far the cancer has spread. This section summarizes the choices available according to the stage of your cancer.

Stage 0

Stage 0 includes 2 types of tumors: carcinoma in situ and verrucous carcinoma. They are treated differently.

Patients with carcinoma in situ that only involves the foreskin can often be treated with circumcision. If the tumor developed in the glans and does not affect other tissues, it may be possible to treat it with topical chemotherapy (such as 5-FU cream) or immunotherapy (imiquimod), or Mohs (microscopically directed) surgery. Laser treatment and radiation therapy may also be options. Penectomy is not often needed.

Verrucous carcinoma can often be treated with laser therapy or Mohs surgery. Only rarely will penectomy be needed. Radiation is not used for this type of tumor, because it can make it more likely to spread.

Stage I

These tumors have grown below the skin of the penis but have not invaded deeper layers. Options for treatment may include circumcision (for tumors confined to the foreskin), surgical removal of part of the penis (partial penectomy), radiation therapy, and Mohs surgery. The use of laser surgery for superficial penile cancer is currently being studied.

Stage II

Stage II penile cancer usually requires a partial or total penectomy, with or without radiation therapy. A less common approach is to use radiation therapy as the first treatment with surgery remaining as an option if the cancer is not completely destroyed by the radiation.

Many doctors recommend checking groin lymph nodes, even if they are not enlarged. This may be done with a sentinel lymph node biopsy or with a more extensive lymph node dissection. If the lymph nodes show cancer spread, then the cancer is not really a stage II. It is a stage III or IV.

Stage III

Stage III penile cancer is treated with a partial or total penectomy. If the tumor involves the scrotum or parts of the abdominal wall, it may also be necessary to remove the testicles and/or the scrotum. A new opening can be made in the abdomen or the perineum to allow urination. In extreme cases, removal of the bladder and prostate may also be needed. Chemotherapy or chemotherapy plus radiation may be used first to shrink the tumor so that it can be removed with surgery.

These cancers usually require an inguinal lymphadenectomy to remove lymph nodes in the groin. Radiation therapy to the groin may be used as well, either after surgery or instead of surgery in selected cases.

These tumors can be hard to treat, so men may want to consider taking part in clinical trials of new treatments.

Stage IV

Stage IV penile cancer is usually not considered curable by current methods. Treatment is designed to try to keep the cancer in check and to prevent or relieve symptoms to the best extent possible. Choices to treat the penile tumor usually include wide local excision, penectomy, or radiation therapy. Surgery or radiation therapy may also be considered to treat nearby lymph nodes.

Chemotherapy may be used to treat cancer that has spread to other areas, such as the lungs or liver. Studies are under way to determine the value of chemotherapy combined with surgery or radiation therapy.

These tumors can be hard to treat, so men may want to think about taking part in clinical trials of new treatments.

Recurrent cancer

The treatment of recurrent cancer depends on where the cancer comes back and what treatments were used before. If penectomy was not done before, a recurrent penile cancer may be treated with surgical removal of the penis. Radiation therapy may also be an option. Surgery and/or radiation may also be options for some cancers that recur in the lymph nodes. Chemotherapy may be helpful in treating more advanced recurrent penile cancers. These tumors can be hard to treat, so men may want to think about taking part in a clinical trial of a newer treatment.

More treatment information

For more details on treatment options -- including some that may not be addressed in this document -- the National Cancer Institute (NCI) is a good source of information.

The NCI provides treatment guidelines via its telephone information center (1-800-4-CANCER) and its Web site (www.cancer.gov). Detailed guidelines intended for use by cancer care professionals are also available on www.cancer.gov.

What should you ask your doctor about penile cancer?

It is important to have honest, open discussions with your cancer care team. You should feel free to ask any question that's on your mind, no matter how small it might seem. Nurses, social workers, and other members of the treatment team may also be able to answer many of your questions. Here are some questions you might want to ask:

- What kind of penile cancer do I have?
- Has my cancer spread beyond the primary site?
- Can the stage of my cancer be determined and what does that mean?
- Are there other tests that need to be done before we can decide on treatment?
- How much experience do you have treating this type of cancer?
- What treatment choices do I have?

What do you recommend and why?

- What should I do to be ready for treatment?
- How long will treatment last? What will it involve? Where will it be done?
- Will I need surgery on my groin lymph nodes?
- How long will it take me to recover from treatment?
- When can I go back to work after treatment?
- What risks or side effects are there to the treatments you suggest?
- How will treatment affect my ability to urinate or to have sex?
- What are the chances that my cancer will recur? What would we do if that happens?

In addition to these sample questions, be sure to write down some of your own. For instance, you may want to ask about second opinions or about clinical trials for which you may qualify.

After treatment, you should report any new symptoms to your doctor right away so that cancer recurrence or side effects of therapy can be treated as effectively as possible.

The doctors, nurses, oncology social workers, and other members of the health care team can help refer you to other organizations for help. Your local American Cancer Society has information and programs that may help meet your medical, emotional, social, and financial needs. Some of these are listed in the "Additional resources" section of this document.

What happens after treatment for penile cancer?

Completing treatment can be both stressful and exciting. You will be relieved to finish treatment, yet it is hard not to worry about cancer coming back. (When cancer returns, it is called *recurrence*.) This is a very common concern among those who have had cancer.

It may take a while before your confidence in your own recovery begins to feel real and your fears are somewhat relieved. You can learn more about what to look for and how to learn to live with the possibility of cancer coming back in our document, *Living With Uncertainty: The Fear of Cancer Recurrence*, available at 1-800-227-2345.

Follow-up care

After your treatment is over, it is very important to keep all follow-up appointments. Your doctor will discuss a follow-up schedule with you, based on your particular situation. During these visits, your doctor will ask about symptoms, do physical exams, and may order blood tests or imaging tests such as CT scans. Follow-up is needed to check for cancer recurrence or spread, as well as possible side effects of certain treatments. This is the time for you to ask your health care team any questions you need answered and to discuss any concerns you might have.

Almost any cancer treatment can have side effects. Some may last for a few weeks to several months, but others can be permanent. Don't hesitate to tell your cancer care team about any symptoms or side effects that bother you so they can help you manage them.

It is also important to keep medical insurance. Even though no one wants to think of their cancer coming back, it is always a possibility. If it happens, the last thing you want is to have to worry about paying for treatment.

Should your cancer come back, our document *When Your Cancer Comes Back: Cancer Recurrence* can give you information on how to manage and cope with this phase of your treatment. You can get this document by calling 1-800-227-2345.

Physical and emotional aspects of penile cancer treatment

For any man, dealing with cancer of the penis is a frightening prospect. Partial or complete removal of the penis is often the most effective way to cure penile cancer, but for many men this cure seems worse than the disease.

It is natural for a man facing treatment for penile cancer to suffer mental distress, depression, and feelings of grief or despair. The better you can anticipate and prepare for these feelings in advance, the better your quality of life will be following treatment. You may want to ask your health care team for a referral to a counselor, who can help you sort through your feelings and adjust to your new body.

Effects on urination

Most men are still continent after surgery -- that is, they can still control the start and stop of urine flow. In certain cases, a partial penectomy leaves enough of the penis to allow relatively normal urination. Many men who have undergone a total penectomy must sit to urinate.

Effects on sexuality

If cancer of the penis is diagnosed early, treatments other than penectomy can often be used. Conservative techniques (such as topical chemotherapy, Mohs surgery, and laser surgery) may have little effect on sexual pleasure and intercourse.

Removing of all or part of the penis can have a devastating effect on a man's self-image and ability to have sexual intercourse. You and your sexual partner may wish to consider counseling to help understand the impact of treatment for penile cancer and to explore other approaches to obtaining sexual satisfaction.

Satisfying intercourse is possible for many, but not all men after partial penectomy. The remaining shaft of the penis still becomes erect with arousal. It usually gains enough length to achieve penetration. Although the most sensitive area of the penis (the glans, or "head") is gone, a man can still reach orgasm and ejaculate normally. His partner should also still be able to enjoy intercourse and often reach orgasm.

Normal intercourse is not possible after total penectomy. Some men give up sex after the surgery. Since cancer of the penis is most common in elderly men, some are already unable to have intercourse because of other health problems. If a man is willing to put some effort into his sex life, however, pleasure is possible after total penectomy. He can learn to reach orgasm when sensitive areas such as the scrotum, skin behind the scrotum, and the area surrounding the surgical scars are caressed. Having a sexual fantasy or looking at erotic pictures or stories can also increase excitement.

A man can help his partner reach orgasm by caressing the genitals, by oral sex, or by stimulation with a sexual aid such as a vibrator. The activity some couples enjoy after total penectomy can give hope to those coping with fewer changes in their sex lives.

After total penectomy, surgical reconstruction of the penis may be possible in some cases. If you are interested in this, talk to your doctor about whether this may be an option in your case.

Seeing a new doctor

At some point after your cancer diagnosis and treatment, you may find yourself in the office of a new doctor. Your original doctor may have moved or retired, or you may have moved or changed doctors for some reason. It is important that you be able to give your new doctor the exact details of your diagnosis and treatment. Make sure you have the following information handy:

- a copy of your pathology report from any biopsies or surgeries
- if you had surgery, a copy of your operative report(s)
- if you were hospitalized, a copy of the discharge summary that doctors must prepare when patients are sent home
- if you had radiation therapy, a summary of the type and dose of radiation and when and where it was given
- if you had chemotherapy or other medicines, a list of your drugs, drug doses, and when you took them

Lifestyle changes to consider during and after treatment

Having cancer and dealing with treatment can be time-consuming and emotionally draining, 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. Some people even begin this process during cancer treatment.

Make healthier choices

Think about your life before you learned you had cancer. Were there things you did that might have made you less healthy? Maybe you drank too much alcohol, or ate more than you needed, or smoked, or didn't exercise very often. Emotionally, maybe you kept your feelings bottled up, or maybe you let stressful situations go on too long.

Now is not the time to feel guilty or to blame yourself. However, you can start making changes today that can have positive effects for the rest of your life. Not only will you feel better but you will also be healthier. What better time than now to take advantage of the motivation you have as a result of going through a life-changing experience like having cancer?

You can start by working on those things that you feel most concerned about. 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's Quitline[®] tobacco cessation program at 1-800-227-2345.

Diet and nutrition

Eating right can be a challenge for anyone, but it can get even tougher during and after cancer treatment. For instance, treatment often may change your sense of taste. Nausea can be a problem. You may lose your appetite for a while and lose weight when you don't want to. On the other hand, some people gain weight even without eating more. This can be frustrating, too.

If you are losing weight or have taste problems during treatment, do the best you can with eating and remember that these problems usually improve over time. You may want to ask your cancer team for a referral to a dietitian, an expert in nutrition who can give you ideas on how to fight some of the side effects of your treatment. You may also find it helps to eat small portions every 2 to 3 hours until you feel better and can go back to a more normal schedule.

One of the best things you can do after treatment is to put healthy eating habits into place. You will be surprised at the long-term benefits of some simple changes, like increasing the variety of healthy foods you eat. Try to eat 5 or more servings of vegetables and fruits each day. Choose whole grain foods instead of white flour and sugars. Try to limit meats that are high in fat. Cut back on processed meats like hot dogs, bologna, and bacon. Get rid of them altogether if you can. If you drink alcohol, limit yourself to 1 or 2 drinks a day at the most. And don't forget to get some type of regular exercise. The combination of a good diet and regular exercise will help you maintain a healthy weight and keep you feeling more energetic.

Rest, fatigue, work, and exercise

Fatigue is a very common symptom in people being treated for cancer. This is often not an ordinary type of tiredness but a "bone-weary" exhaustion that doesn't get better with rest. For some, this fatigue lasts a long time after treatment, and can discourage them from physical activity.

However, exercise can actually help you reduce fatigue. Studies have shown that patients who follow an exercise program tailored to their personal needs feel physically and emotionally improved and can cope better.

If you are ill and need to be on bed rest during treatment, it is normal to expect your fitness, endurance, and muscle strength to decline some. Physical therapy can help you maintain strength and range of motion in your muscles, which can help fight fatigue and the sense of depression that sometimes comes with feeling so tired.

Any program of physical activity should fit your own situation. An older person who has never exercised will not be able to take on the same amount of exercise as a 20-year-old who plays tennis 3 times a week. If you haven't exercised in a few years but can still get around, you may want to think about taking short walks.

Talk with your health care team before starting, and get their opinion about your exercise plans. Then, try to get an exercise buddy so that you're not doing it alone. Having family or friends involved when starting a new exercise program can give you that extra boost of support to keep you going when the push just isn't there.

If you are very tired, though, you will need to balance activity with rest. It is okay to rest when you need to. It is really hard for some people to allow themselves to do that when they are used to working all day or taking care of a household.

Exercise can improve your physical and emotional health.

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

And long term, we know that exercise plays a role in preventing some cancers. The American Cancer Society, in its guidelines on physical activity for cancer prevention, recommends that adults take part in at least 1 physical activity for 30 minutes or more on 5 days or more of the week.

How about your emotional health?

Once your treatment ends, you may find yourself overwhelmed by emotions. This happens to a lot of people. You may have been going through so much during treatment that you could only focus on getting through your treatment.

Now you may find that you think about the potential of your own death, or the effect of your cancer on your family, friends, and career. You may also begin to re-evaluate your relationship with your spouse or partner. Unexpected issues may also cause concern -- for instance, as you become healthier and have fewer doctor visits, you will see your health care team less often. That can be a source of anxiety for some.

This is an ideal time to seek out emotional and social support. You need people you can turn to for strength and comfort. Support can come in many forms: family, friends, cancer support groups, church or spiritual groups, online support communities, or individual counselors.

Almost everyone who has been through cancer can benefit from getting some type of support. What's best for you depends on your situation and personality. Some people feel safe in peer-support groups or education groups. Others would rather talk in an informal setting, such as church. Others may feel more at ease talking one-on-one with a trusted friend

or counselor. 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. It is not necessary or realistic to go it all by yourself. And 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 an appropriate group or resource.

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 feeling as well as possible, physically and emotionally.

What happens if treatment is no longer working?

If cancer continues to grow after one kind of treatment, or if it returns, it is often possible to try another treatment plan that might still cure the cancer, or at least shrink the tumors enough to help you live longer and feel better. On the other hand, when a person has received several different medical treatments and the cancer has not been cured, over time the cancer tends to become resistant to all treatment. At this time it's important to weigh the possible limited benefit of a new treatment against the possible downsides, including continued doctor visits and treatment side effects.

Everyone has his or her own way of looking at this. Some people may want to continue treatment for as long as possible, while others may want to focus on remaining comfortable during their limited time left.

This is likely to be the most difficult time in your battle with cancer -- when you have tried everything medically within reason and it's just not working anymore. Although your doctor may offer you new treatment, you need to consider that at some point, continuing treatment is not likely to improve your health or change your prognosis or survival.

If you want to continue treatment to fight your cancer as long as you can, you still need to consider the odds of more treatment having any benefit. In many cases, your doctor can estimate the response rate for the treatment you are considering. Some people are tempted to try more chemotherapy or radiation, for example, even when their doctors say that the odds of benefit are less than 1%. In this situation, you need to think about and understand your reasons for choosing this plan.

No matter what you decide to do, it is important that you be as comfortable as possible. Make sure you are asking for and getting treatment for any symptoms you might have, such as pain. This type of treatment is called *palliative* treatment.

Palliative treatment helps relieve these symptoms, but is not expected to cure the disease; its main purpose is to improve your quality of life. Sometimes, the treatments you get to control your symptoms are similar to the treatments used to treat cancer. For example, radiation therapy might be given to help relieve bone pain from bone metastasis. Or chemotherapy might be given to help shrink a tumor and keep it from causing a bowel obstruction. But this is not the same as receiving treatment to try to cure the cancer.

At some point, you may benefit from hospice care. Most of the time, this is given at home. Your cancer may be causing symptoms or problems that need attention, and hospice focuses on your comfort. You should know that receiving hospice care doesn't mean you can't have treatment for the problems caused by your cancer or other health conditions. It just means that the focus of your care is on living life as fully as possible and feeling as well as you can at this difficult stage of your cancer.

Remember also that maintaining hope is important. 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 happiness and meaning. In a way, pausing at this time in your cancer treatment is an opportunity to refocus on the most important things in your life. This 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.

What's new in penile cancer research and treatment?

Important research into penile cancer is currently under way in many university hospitals, medical centers, and other institutions around the country. Each year, scientists find out more about what causes the disease, how to prevent it, and how to improve treatment.

Unfortunately, penile cancer is an uncommon disease, which makes it harder to study. For example, it is hard to get large numbers of men to enroll in clinical trials to test newer forms of treatment, simply because there are fewer men with this type of cancer.

In some cases, the use of laser therapy can cure or control the disease in its early stages and preserve the appearance and function of the penis. Research is being done to identify the best type of laser to use in these early tumors.

Scientists are working to discover the best ways to use radiation. This may mean combining radiation with chemotherapy to avoid surgical removal of the penis, whenever possible.

Doctors are also studying newer uses of chemotherapy for penile cancer, such as giving it before surgery to try to shrink the tumor. This might make surgery more effective, or might even allow the doctor to do a less invasive type of surgery. Doctors are also looking at using different chemotherapy drugs to treat penile cancer, such as paclitaxel, docetaxel, and ifosfamide.

Scientists are learning much more about how certain genes called *oncogenes* and *tumor suppressor genes* control cell growth and how changes in these genes cause normal cells to become cancerous. The ultimate goal of this research is *gene therapy* -- replacing the damaged genes in cancer cells with normal genes to stop the abnormal behavior of these cells.

Vaccines that protect against infection with types of HPV linked to certain cancers have been developed. One of these, Gardasil, is now approved for use in young men to help prevent genital warts. While it has not yet been studied, the hope is that the vaccine may eventually help prevent several types of cancer linked to HPV, including penile cancers.

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.

After Diagnosis: A Guide for Patients and Families (also available in Spanish)

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

Living With Uncertainty: The Fear of Cancer Recurrence

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

Surgery (also available in Spanish)

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

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

When Your Cancer Comes Back: Cancer Recurrence

The following books are available from the American Cancer Society. Call us at 1-800-227-2345 to ask about costs or place your order.

American Cancer Society Complete Guide to Complementary & Alternative Cancer Therapies, 2nd Edition

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

Caregiving: A Step-By-Step Resource for Caring for the Person With Cancer at Home

Couples Confronting Cancer

Lymphedema: Understanding and Managing Lymphedema After Cancer Treatment
What Helped Get Me Through: Cancer Patients Share Wisdom and Hope

National organizations and Web sites*

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

National Cancer Institute

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

Web site: www.cancer.gov

National Coalition for Cancer Survivorship

Toll-free number: 1-877-622-7937 (1-877-NCCS-YES)

Web site: www.canceradvocacy.org

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

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

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1 · 800 · ACS-2345 or www.cancer.org