Penile Cancer

What is cancer?

The body is made up of trillions of living cells. Normal body cells grow, divide to make new cells, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out 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 named (and treated) based on the place where it started. For example, breast cancer that has spread to the liver is still breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bone is still 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.

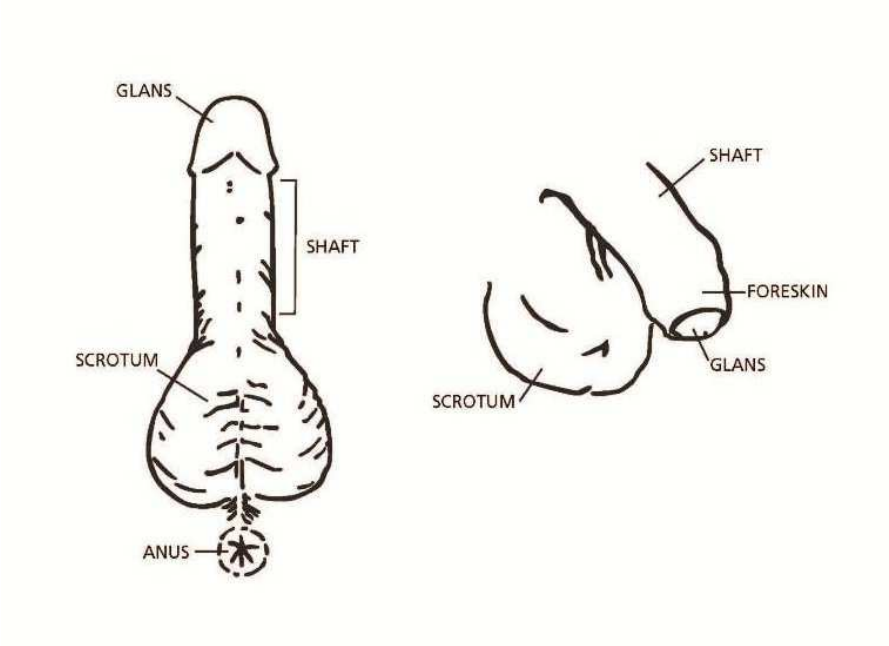
Not all tumors are cancerous. Tumors that aren't cancer are called *benign*. Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they cannot grow into (invade) other tissues. Because they can't invade, they also can't spread to other parts of the body (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.

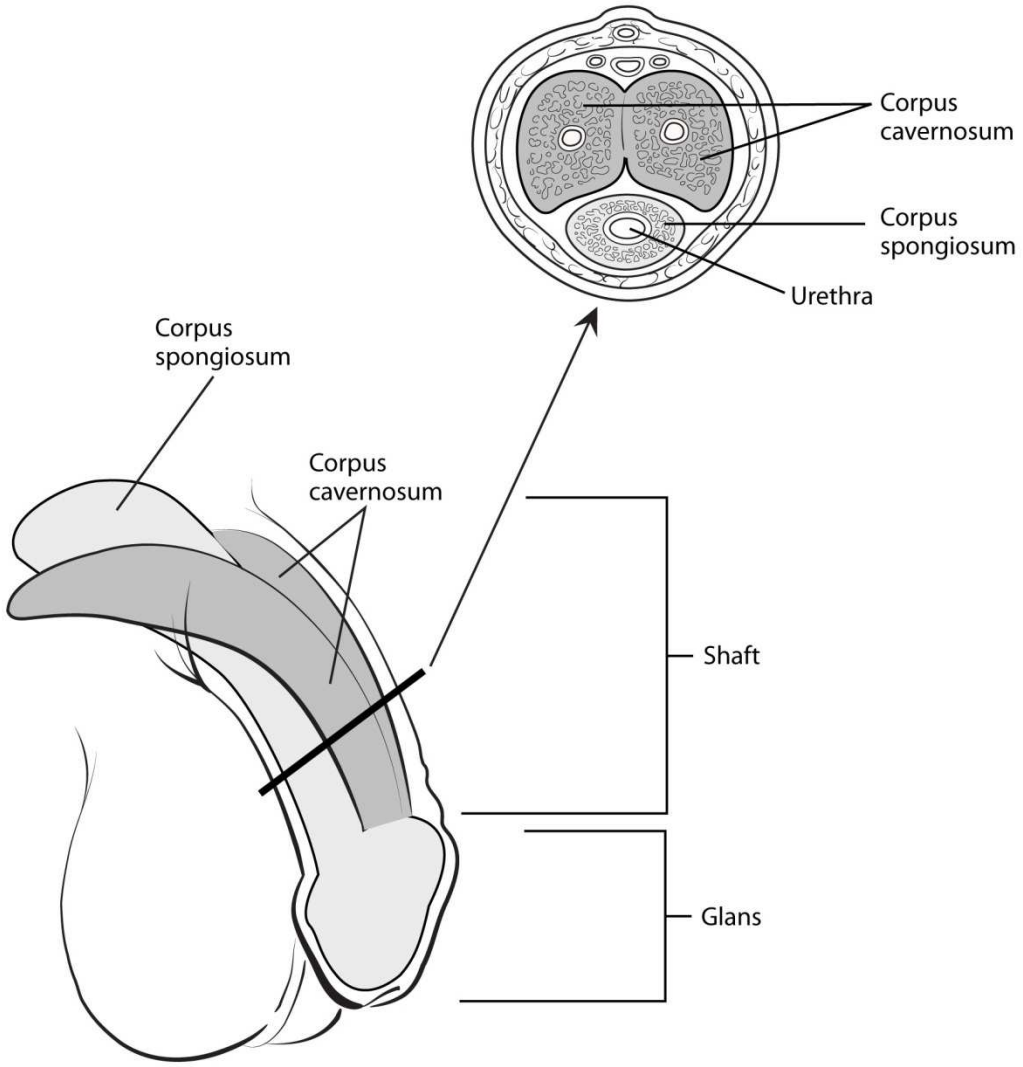
About the penis

The penis is the external male sexual organ, as well as part of the urinary system. It has 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 chamber 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 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.

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 with 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 early-stage cancer called *carcinoma in situ* (CIS), but most doctors agree it is not cancer or a pre-cancerous condition.

Cancers of the penis

Each tissue 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 get very large. They can grow deep 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 color in the skin that helps protect it from the sun. These cancers tend to grow and spread quickly and are more dangerous than other types of skin cancer. Melanomas are most often found in sun-exposed skin, but they 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 grow into the tissues under the skin and then spread to lymph nodes.

Sarcoma

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

What are the key statistics about penile cancer?

The American Cancer Society estimates for penile cancer in the United States for 2014 are:

- About 1,640 new cases of penile cancer will be diagnosed

- About 320 men will die of penile cancer

Penile cancer is very rare in North America and Europe. Penile cancer occurs in less than 1 man in 100,000 and accounts for less than 1% of cancers in men in the United States. Penile cancer is, however, 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.

Human papilloma virus infection

Human papilloma virus (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.

Certain HPV types can infect the outer female and male genital organs and the anal area, causing raised, bumpy warts. These warts may barely be visible or they may be several inches across. The medical term for genital warts is *condyloma acuminatum*. Two types of HPV, HPV 6 and HPV 11, cause most cases of genital warts. These 2 types are seldom linked to cancer, and so are called *low-risk* types of HPV. However, other HPV types have been linked with cancers and are known as *high-risk* types of HPV. These include HPV 16, HPV 18, HPV 31, as well as others. Infection with a high-risk HPV may produce no visible signs until pre-cancerous changes or cancer develops.

HPV infection is found in about half of all penile cancers. Researchers believe that infection with HPV is an important risk factor for penile cancer. HPV infection is also linked to many other cancers, including cancers of the cervix, vagina, and vulva in women and cancers of the anus in men and women. It is also a factor in some throat cancers (in men and women).

HPV is passed from one person to another during skin-to-skin contact with an infected area of the body. HPV can be spread during sex -- including vaginal, anal, and oral – but sex doesn't have to occur for the infection to spread. All that is needed is skin-to-skin contact with an area of the body infected with HPV. Infection with HPV seems to be able to be spread from one part of the body to another, for example, infection may start in the penis and then spread to the anus. The only way to completely prevent anal and genital HPV infection may be to never allow another person to have contact with those areas of the body.

HPV infection is common. One study found that about half of men 18 and older have a genital HPV infection at any point in time. In most people, the body is able to clear the infection on its own. In some, however, the infection does not go away and becomes chronic. Chronic infection, especially with high-risk HPV types, can eventually cause certain cancers, including penile cancer. Men who are not circumcised are more likely to get and stay infected with HPV.

Not being circumcised

Circumcision removes all (or 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 during childhood. Men who were circumcised as children have a lower chance of getting penile cancer than those who were not, but studies looking at this issue have not found the same protective effect if the foreskin is removed as an adult. Some studies even suggested a higher risk of penile cancer in men who were circumcised as adults. 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 the condition called *phimosis,* and cannot accumulate material known as *smegma* (see next section). Men with smegma or phimosis have an increased risk of penile cancer. The later a man is circumcised the more likely it is that one of these conditions will occur first. Also, circumcised men are less likely to get and stay infected with the human papilloma virus (HPV), even after accounting for differences in sexual behavior. Again, the later a man is circumcised, the more likely it is that he will be infected with HPV before the procedure.

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. Although the American Academy of Pediatrics has stated that the health benefits of circumcision in newborn males outweigh the risks, it also stated these benefits are not great enough to recommend that all newborns be routinely circumcised.

In the end, decisions about circumcision are highly personal and often depend more on social and religious factors than on medical evidence.

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. The reason for this is not clear. Phimosis can often be prevented by retracting the foreskin when washing the penis.

Smegma

Sometimes secretions can build up underneath the intact foreskin. If the area under the foreskin isn't cleaned well, these secretions build up enough to become 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 is more common in men with phimosis, but can occur in anyone with a foreskin, if the foreskin is not regularly retracted to clean the head of the penis.

Some older studies have suggested a link between smegma and penile cancer, and in the past some experts were concerned that smegma may also contain compounds that can cause cancer. Most experts now believe that smegma itself probably doesn't cause penile cancer, but it can irritate and inflame the penis, which may increase the risk of cancer. It may also make it harder to see very early cancers. Men can prevent smegma from building up simply by washing the penis with the foreskin retracted.

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. They can travel in the bloodstream throughout the body to cause cancer in many different areas. Researchers believe that these substances damage genes in cells of the penis, which can lead to the development of penile cancer. Smoking also increases the risk of HPV infection, likely due to effects on immune function.

UV light treatment of psoriasis

Men who have a skin disease called *psoriasis* are sometimes treated with drugs called *psoralens*, followed by exposing 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 (**a**cquired **i**mmuno**d**eficiency **s**yndrome) 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(human immunodeficiency virus)-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 called "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 regulate themselves by making 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 papilloma virus (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. One 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 in some studies, the protective effect of circumcision was no longer seen after factors like smegma and phimosis were taken into account.

In the United States, the risk of penile cancer is low even among uncircumcised men. Men who wish to lower their risk of penile cancer can do so by avoiding human papilloma virus (HPV) infection and not smoking. Those who aren't circumcised can also lower their risk of penile cancer by practicing good hygiene. Although infant circumcision can lower the risk of penile cancer, based on the risk of this cancer in the US, it would take over 900 circumcisions to prevent one case of penile cancer in this country.

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 prescribe a cream or ointment that can be applied to the foreskin to make it easier to do so. If this doesn't work the doctor may cut the skin of the foreskin in a procedure called a *dorsal slit* to make retraction easier.

Avoiding HPV infection

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

The 2 main factors influencing the risk of genital HPV infection in men are circumcision and the number of sexual partners. Men who are circumcised (have had the foreskin of the penis removed) have a lower chance of becoming and staying infected with HPV. Men who have not been circumcised are more likely to be infected with HPV and pass it on to their partners. The reasons for this are unclear. It may be that after circumcision the skin on the glans (of the penis) goes through changes that make it more resistant to HPV infection. Another theory is that the surface of the foreskin (which is removed by circumcision) is more easily infected by HPV. Still, circumcision does not completely protect against HPV infection -- men who are circumcised can still get HPV and pass it on to their partners. The risk of being infected with HPV is also strongly linked to having many sexual partners (over a man's lifetime).

Condoms ("rubbers") provide some protection against HPV, but they do not completely prevent infection. Men who regularly use condoms are less likely to be infected with HPV and pass it on to their female partners. Condoms cannot protect completely because they don't cover every possible HPV-infected area of the body, such as the skin on the

genital or anal area. Still, condoms do provide some protection against HPV, and they also protect against HIV and some other sexually transmitted diseases.

HPV infection 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.

Vaccination against HPV

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 HPV types 16 and 18, which cause some cancers. Another vaccine, Cervarix®, protects against HPV types 16 and 18. Both Gardasil and Cervarix are approved for use in females, but only Gardasil is approved for use in males.

Gardasil's approval for males is based on studies that show that it can help prevent genital warts and anal cancers in men. So far, it has not been studied to see if it lowers the risk of penile cancer. In 2011, the Advisory Committee on Immunization Practices (ACIP) published its recommendations for the use of Gardasil in males. The committee recommends that the vaccine be given routinely to males aged 11 or 12 years. ACIP also recommended that the vaccine be given to males aged 13 through 21 years who have not been vaccinated previously or who have not completed the 3-dose series. Men aged 22 through 26 years may also be vaccinated.

These vaccines work best if given before the person starts having sex (and is exposed to HPV). Giving them the vaccine when they are young helps ensure that the person receiving the vaccine has not yet been exposed to HPV and so is more likely to benefit.

The hope is that HPV vaccines may eventually help reduce the risk of all cancers linked to HPV, including penile cancers.

Not smoking

Since smoking also increases penile cancer risk, not smoking might lower that risk. 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 avoidable 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 caused by 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 of 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.

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 might 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 could also develop on the shaft. The sore or lump is not usually painful, but it can be in some cases.

Sometimes the cancer looks like 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 make those lymph nodes swell. Lymph nodes are collections of immune system cells that fight infection. Normally, they are bean-sized and can barely be felt at all. If they are swollen, the lymph nodes may easily be felt 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 it is likely to be.

How is penile cancer diagnosed?

If you have symptoms of penile cancer you should go to a doctor, who will do an exam and may order some tests.

Medical history and physical exam

Your doctor will need to take a complete medical history to get details about your symptoms and any possible risk factors you have.

Your doctor will also look at your genital area 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 have penile cancer, you will need other tests. 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 tissue from the abnormal area 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 if cancer cells are present. The results are usually available in 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. If the abnormal area is only on the foreskin, your doctor may recommend circumcision as a form of excisional biopsy to remove the lesion completely.

These biopsies are usually done in a hospital or outpatient surgical center. Local anesthesia (numbing medicine) or general anesthesia (where you are asleep) may be used.

Lymph node biopsy

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. These lymph nodes may be checked either with fine needle aspiration or with surgery to remove them.

For 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.

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.

In some cases, the lymph nodes are not checked with FNA, but instead through surgery to remove one or more lymph nodes. These surgical lymph node biopsies, which include sentinel lymph node biopsies and lymphadenectomy, are described in the section “Surgery for penile cancer.” To learn more about biopsies, see our document, *Testing Biopsy and Cytology Specimens for Cancer*.

Imaging tests

Imaging tests use x-rays, magnetic fields, or sound waves to create pictures of the inside of your body. 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.

A CT scanner has been described as a large donut, with a narrow table in the middle opening. You will need to lie still on the table while the scan is being done. CT scans take longer than regular x-rays, and you might feel a bit confined by the ring while the pictures are being taken

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

Before the test, you may be asked to drink 1 to 2 pints of a liquid called *oral contrast* 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-guided needle biopsy: 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. Special, more open MRI machines can sometimes help with this if needed, but the drawback is that the images may not be as clear. The MRI machine makes buzzing and clicking noises that you may find disturbing. Some places will provide earplugs to help block this noise out. MRIs are not safe for people with pacemakers or certain implants containing metals that are strongly attracted to magnets.

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 show 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).

The stage of a cancer does not change over time, even if the cancer progresses. A cancer that comes back or spreads is still referred to by the stage it was given when it was first found and diagnosed, only information about the current extent of the cancer is added. A person keeps the same diagnosis stage, but more information is added to the diagnosis to explain the current disease status

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 **t**umor (how far it has spread within the penis and to nearby organs).
- **N** stands for spread to nearby lymph **n**odes (bean-sized collections of immune system cells that help fight infections and cancers).

- **M** is for **m**etastasis (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 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). This is sometimes called *erythroplasia of Queyrat* when it occurs on the glans of the penis. It can be called *Bowen disease* when it occurs on the shaft of the penis.

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

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

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 case 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 is only in the top layers of the 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 top 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 top 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 top 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 also 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 tissue below the top layer of skin and may have grown into the corpus spongiosum, the corpus cavernosum, or the urethra (T1 to T3). It has also 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 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

A cancer is called *recurrent* if it 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.

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. If you decide that you don’t want to know them, stop reading here and skip to the next section.

The 5-year survival rate is the percentage of patients who live *at least* 5 years after their cancer is diagnosed. Many of these patients live much longer than 5 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 better way to see the impact of cancer on survival.

To get 5-year survival rates, doctors have to look at people who were treated at least 5 years ago. Improvements in treatment since then may result in a more favorable outlook for people now being diagnosed with penile cancer.

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 rates below are based on the stage of the cancer when it is first *diagnosed*. When looking at survival rates, it’s important to understand that the stage of a cancer does not change over time, even if the cancer progresses. A cancer that comes back or spreads is still referred to by the stage it was given when it was first found and diagnosed, but more information is added to explain the current extent of the cancer. (And of course, the treatment plan is adjusted based on the change in cancer status.)

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.

- For cancers that are still confined to the penis (like stage I and II), the 5-year relative survival rate is around 85%.
- If the cancer has spread to nearby tissues or lymph nodes (like stage III and some stage IV), 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 penile cancer 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.

Depending on the type and stage of your cancer, you might need more than one type of treatment. Doctors on your cancer treatment team may include:

- A urologist: a surgeon who specializes in diseases of the male genitals and urinary tract
- A radiation oncologist: a doctor who uses radiation to treat cancer
- A medical oncologist: a doctor who uses chemotherapy and other medicines to treat cancer

Many other specialists may be involved in your care as well, including nurse practitioners, nurses, psychologists, social workers, rehabilitation specialists, and other health professionals.

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

- Surgery
- Topical therapy (for some very early penile cancers)
- 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.

It is important to discuss all of your treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. It’s also very important to ask questions if there is anything you’re not sure about. You can find some good questions to ask in the section, “What should you ask your doctor about penile cancer?

For information about some of the most common approaches used based on the extent of the disease, see the section “Treatment of penile cancers, by stage.”

Surgery for penile cancer

Surgery is the most common treatment for all stages of penile cancer. If the cancer is detected early, 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 of 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 grown 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 surgery can often cure cancers that are only in 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 carcinoma in situ and for some cancers that have not grown 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 (cancer cells in only the outer layer of the skin) and for very thin or shallow basal cell cancers.

Cryosurgery

This approach freezes the cancer cells with a probe cooled with liquid nitrogen. It is useful for some verrucous penile cancers and carcinoma in situ of the glans.

Partial or total penectomy

This operation removes part of 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 man 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.

For advanced tumors, sometimes the penis is removed along with the scrotum (and testicles). This operation is called *emasculation*. Since this operation removes the main natural source of the male hormone testosterone, men who have this procedure must take a man-made version of this hormone for the rest of their life.

Any of these operations 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 for penile cancer?"

Surgery to remove lymph nodes

Patients with cancers that have grown 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 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 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 have 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 by seeing 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. Early studies showed that a sentinel lymph node procedure was helpful in finding those men whose cancer had spread to their lymph nodes, but later studies did not show that it was very accurate, and some men with lymph node spread could be missed if the sentinel lymph node procedure was used.

Also, 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 to the success of this procedure. Discuss the procedure with your doctor.

Inguinal lymphadenectomy (groin lymph node dissection): Many men with penile cancer have swollen groin lymph nodes when they are first diagnosed. 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 over 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 have cancer.

Side effects of lymph node surgery: The groin 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 problems with fluid drainage, causing abnormal swelling. 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 developed severe lymphedema in both legs. Now fewer lymph nodes are usually removed, which lowers the chance that lymphedema will occur. Still,

lymphedema can occur even when only one lymph node or the lymph nodes from only one groin area are removed. For more on this, see our document, *Understanding Lymphedema: For Cancers Other than Breast Cancer*.

Other side effects can occur after lymph node surgery, and can include problems with wound healing, infection, and skin breakdown (necrosis). These are not common.

Radiation therapy for penile cancer

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 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 puts 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 given 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. The skin in the treated area can become red and sensitive. There may be patches of skin that are oozing and tender. For some, the skin may even peel. For a while, you may feel a burning sensation when you urinate. The area may also swell for a time.

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:

- Some of the skin or tissue at the end of the penis can die (called *necrosis*).
- The urethra can become narrow from scar tissue (called *stenosis*), leading to problems passing urine.
- An abnormal opening (fistula) can form 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.

For more on using radiation to treat cancer, see our document *Understanding Radiation Therapy: A Guide for Patients and Families.*

Topical therapy for penile cancer

Some very early penile cancers (carcinoma in situ) can be treated with drugs applied directly on the penis. This is called *topical therapy*.

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 grown 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 makes the treated skin red and very sensitive for a few weeks. Using other topical medicines or creams can help relieve this.

Imiquimod

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.

If you'd like more information on a drug used in your treatment or a specific drug mentioned in this section see our Guide to Cancer Drugs , ask a member of your health care team, or call us with the names of the medicines you're taking.

Chemotherapy for penile cancer

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.

Systemic chemotherapy

Systemic chemo uses anti-cancer drugs that are injected into a vein or given by mouth. These drugs go through the bloodstream and reach cancer cells in all areas of the body. This treatment is useful for cancers that have spread to lymph nodes or distant organs. Chemo 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 (called *adjuvant* chemotherapy) will keep the cancer from coming back and improve survival.

Doctors give chemo in cycles, with each cycle of treatment followed by a rest period to give the body time to recover. Chemo cycles generally last about 3 to 4 weeks. Some of the drugs used to treat penile cancer include:

- Cisplatin
- Fluorouracil (5-FU)
- Methotrexate (MTX)
- Bleomycin
- Paclitaxel (Taxol®)
- Ifosfamide (Ifex®, ifos)
- Vincristine

Often, these drugs are used together to treat penile cancer that has spread to lymph nodes or other organs. Some commonly used combinations include:

- Vincristine, bleomycin, and methotrexate
- Cisplatin plus 5-FU
- BMP: bleomycin, methotrexate, and cisplatin ("platinum")
- TIP: paclitaxel (Taxol), ifosfamide, and cisplatin ("platinum")

Possible side effects: Chemotherapy drugs attack 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, divide quickly, too. These cells are also likely to be affected by chemotherapy, which can lead to some side effects.

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

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Low blood counts

Chemo drugs can affect the blood-forming cells of the bone marrow. This can lead to:

- Increased chance of infections (from low white blood cell counts)
- Easy bruising or bleeding (from low blood platelet counts)

- Fatigue (from low red blood cell counts)

These side effects usually don’t last long and go away after treatment is finished. There are often ways to lessen chemo side effects. For example, you can get medicine to help prevent or reduce nausea and vomiting.

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 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 and paclitaxel can also cause nerve damage.
- A rare side effect of bleomycin is lung damage, which can lead to problems breathing. This risk is higher in patients who smoke.
- Ifosfamide can damage the lining of the bladder (called *hemorrhagic cystitis*). A drug called *mesna* is often given with ifosfamide to prevent this problem.

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.

For more information on chemotherapy, see our document, *Understanding Chemotherapy: A Guide for Patients and Families*. If you’d like to know more about a drug used in your treatment or a specific drug mentioned in this section see our Guide to Cancer Drugs , ask a member of your health care team, or call us with the names of the medicines you’re taking.

Clinical trials for penile cancer

You may have had to make a lot of decisions since you've been told you have cancer. One of the most important decisions you will make is 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 website at www.cancer.org/clinicaltrials. You can also get a list of current clinical trials by calling the National Cancer Institute's Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) or by visiting the NCI clinical trials website 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. In some cases they may be the only way to get access to newer treatments. They are also the only way for doctors to learn better methods to treat cancer. Still, they are not right for everyone.

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

Complementary and alternative therapies for penile cancer

When you have cancer you are likely to hear about ways to treat your cancer or relieve symptoms that your doctor hasn't mentioned. Everyone from friends and family to Internet groups and websites might 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 few or no side effects sounds great. Sometimes medical treatments like chemotherapy can be hard to take, or they may no longer work. 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. You can also learn more on the *Complementary and Alternative Medicine* page of our website.

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 for penile cancer, 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 the 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 is only in 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 therapy (such as 5-FU cream or imiquimod) or Mohs (microscopically directed) surgery. Laser treatment, cryotherapy, and radiation therapy are also possible options. Penectomy is not often needed.

Verrucous carcinoma can often be treated with laser therapy, cryotherapy, 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 not into 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. Laser surgery may also be an option.

Stage II

Stage II penile cancer includes tumors that have grown into the tissues of the penis (such as the corpus spongiosum or cavernosum) or the urethra, but have not spread to nearby lymph nodes. These cancers are usually treated with 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. Radiation may also be used as the main treatment in men who cannot have surgery due to severe medical problems.

Some 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 cancers include T1, T2, and T3 tumors that have spread to nearby lymph nodes (N1 or N2). Stage III includes tumors that have grown into the corpus spongiosum, corpus cavarnosum, or urethra, but not tumors that have grown into nearby structures like the bladder or prostate.

Stage III cancers are treated with a partial or total penectomy. In a few cases, chemotherapy (chemo) or chemo plus radiation may be used first to shrink the tumor so that it can be more easily removed with surgery.

These cancers 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 includes cancers that have spread to nearby tissues, like the prostate, bladder, scrotum, or abdominal wall (T4). Treatment may include surgery to remove the main tumor, such as penectomy. If the tumor is in 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. If the tumor has grown into the prostate or bladder, these may need to be removed, as well. Chemo (sometimes with radiation) may be given before surgery (this is called *neoadjuvant* treatment) to try to shrink the tumor and make it easier to remove. The inguinal (groin) lymph nodes on both sides will be removed as well. This area may also be treated with radiation after surgery (unless it was given before surgery).

Stage IV also includes smaller cancers with more extensive spread to the lymph nodes (N3), such as cancer in groin lymph nodes that has grown through the lymph nodes' outer covering and into surrounding tissue or cancer spread to lymph nodes inside the pelvis. This stage is treated with surgery to remove the main tumor in the penis, such as penectomy. The lymph nodes in both groins are also removed. The lymph nodes inside the pelvis will also be removed if they are thought to contain cancer spread (if they are enlarged, for example). After the lymph nodes are removed, those areas are often treated with radiation to try to kill any cancer cells that may be have left behind (but are too small to see).

Penile cancer that has spread to distant organs and tissues is also considered stage IV. This 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. Radiation may also be used to treat areas of cancer spread in the bones or in the brain or spinal cord.

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

Stage IV cancers are 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 penile cancer

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 website (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 ask any question, no matter how small it might seem. Nurses, social workers, and other members of the treatment team might 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 (metastasized)?
- What is the stage of my cancer and what does that mean?
- Do I need more tests before we can decide on treatment?
- How much experience do you have treating this type of cancer?
- What are my treatment choices?
- What do you recommend and why?
- What should I do to be ready for treatment?
- How long will treatment last? What will it be like? 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?
- Will treatment affect my ability to urinate, have sex, or to have children?

- 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.

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 for penile cancer " section of this document.

What happens after treatment for penile cancer?

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

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

For other people, the cancer may never go away completely. These people may get regular treatments with chemotherapy, radiation therapy, or other therapies to try to help keep the cancer in check. Learning to live with cancer that does not go away can be difficult and very stressful. It has its own type of uncertainty. Our document *When Cancer Doesn't Go Away* talks more about this.

Follow-up care

When treatment ends, your doctors will still want to watch you closely. It is very important to go to all of your follow-up appointments. During these visits, your doctors will ask questions about any problems you may have and may do exams and lab tests or x-rays and scans to look for signs of cancer or treatment side effects. Almost any cancer treatment can have side effects. Some may last for a few weeks to months, but others can last the rest of your life. This is the time for you to talk to your cancer care team about any changes or problems you notice and any questions or concerns you have.

After your cancer treatment is finished, you will probably need to still see your cancer doctor for many years. So, ask what kind of follow-up schedule you can expect.

It is important to keep your health insurance. Tests and doctor visits cost a lot, and even though no one wants to think of their cancer coming back, this could happen.

Should your cancer come back, our document *When Your Cancer Comes Back: Cancer Recurrence* gives you information to help manage and cope with this phase of your treatment.

Long-term side effects of penile cancer treatment

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 once you have fully recovered.

Removing 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 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, ask your doctor if this might be an option for you.

For more information on these topics, see our document, *Sexuality for the Man with Cancer*.

Seeing a new doctor after treatment for penile cancer

At some point after your cancer diagnosis and treatment, you may find yourself seeing a new doctor who does not know anything about your medical history. It is important that you be able to give your new doctor the details of your diagnosis and treatment. Gathering these details soon after treatment may be easier than trying to get them at some point in the future. Make sure you have this information handy:

- A copy of your pathology report(s) 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 copy of the treatment summary
- If you had chemotherapy or other medicines, a list of your drugs, drug doses, and when you took them

The doctor might want copies of this information for his records, but always keep copies for yourself.

Lifestyle changes after having penile cancer

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 choices to help you stay healthy and feel as well as you can. This can 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 start during cancer treatment.

Making healthier choices

For many people, a diagnosis of cancer helps them focus on their health in ways they may not have thought much about in the past. Are there things you could do that might make you healthier? Maybe you could try to eat better or get more exercise. Maybe you could cut down on the alcohol, or give up tobacco. Even things like keeping your stress

level under control may help. Now is a good time to think about making changes that can have positive effects for the rest of your life. You will feel better and you will also be healthier.

You can start by working on those things that worry you most. Get help with those that are harder for you. For instance, if you are thinking about quitting smoking and need help, call the American Cancer Society for information and support. This tobacco cessation and coaching service can help increase your chances of quitting for good.

Eating better

Eating right can be hard for anyone, but it can get even tougher during and after cancer treatment. Treatment may change your sense of taste. Nausea can be a problem. You may not feel like eating and lose weight when you don't want to. Or you may have gained weight that you can't seem to lose. All of these things can be very frustrating.

If treatment caused weight changes or eating or taste problems, do the best you can and keep in mind that these problems usually get better over time. You may find it helps to eat small portions every 2 to 3 hours until you feel better. You may also want to ask your cancer team about seeing a dietitian, an expert in nutrition who can give you ideas on how to deal with these treatment side effects.

One of the best things you can do after cancer treatment is put healthy eating habits into place. You may be surprised at the long-term benefits of some simple changes, like increasing the variety of healthy foods you eat. Getting to and staying at a healthy weight, eating a healthy diet, and limiting your alcohol intake may lower your risk for a number of types of cancer, as well as having many other health benefits.

Rest, fatigue, and exercise

Extreme tiredness, called fatigue, is very common in people treated for cancer. This is not a normal tiredness, but a "bone-weary" exhaustion that doesn't get better with rest. For some people, fatigue lasts a long time after treatment, and can make it hard for them to exercise and do other things they want to do. But exercise can help reduce fatigue. Studies have shown that patients who follow an exercise program tailored to their personal needs feel better physically and emotionally and can cope better, too.

If you were sick and not very active during treatment, it is normal for your fitness, endurance, and muscle strength to decline. Any plan for physical activity should fit your own situation. A person who never exercises will not be able to take on the same amount of exercise as someone who plays tennis twice a week. If you haven't exercised in a few years, you will have to start slowly – maybe just by taking short walks.

Talk with your health care team before starting anything. Get their opinion about your exercise plans. Then, try to find an exercise buddy so 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, you will need to balance activity with rest. It is OK to rest when you need to. Sometimes it's really hard for people to allow themselves to rest when they are used to working all day or taking care of a household, but this is not the time to push yourself too hard. Listen to your body and rest when you need to. (For more information on dealing with fatigue, please see *Fatigue in People With Cancer* and *Anemia in People With Cancer*.)

Keep in mind exercise can improve your physical and emotional health.

- It improves your cardiovascular (heart and circulation) fitness.
- Along with a good diet, it will help you get to and stay at a healthy weight.
- It makes your muscles stronger.
- It reduces fatigue and helps you have more energy.
- It can help lower anxiety and depression.
- It can make you feel happier.
- It helps you feel better about yourself.

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

How does having penile cancer affect your emotional health?

For any man, dealing with cancer of the penis is a frightening prospect. Partially or completely removing 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 might 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.

When treatment ends, you may find yourself overcome with many different 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 each day. Now it might feel like a lot of other issues are catching up with you.

You may find yourself thinking about death and dying. Or maybe you're more aware of the effect the cancer has on your family, friends, and career. You may take a new look at your relationship with those around you. Unexpected issues may also cause concern. For instance, as you feel better and have fewer doctor visits, you will see your health care team less often and have more time on your hands. These changes can make some people anxious.

Almost everyone who has been through cancer can benefit from getting some type of 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 one-on-one counselors. 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 good for you to try to deal with everything on your own. And your friends and family may feel shut out if you do not include them. Let them in, and let in anyone else who you feel may help. If you aren't sure who can help, call your American Cancer Society at 1-800-227-2345 and we can put you in touch with a group or resource that may work for you. You can also learn more in our booklet *Distress in People With Cancer*.

If treatment for penile cancer stops working

If cancer keeps growing or comes back after one kind of treatment, it is possible that another treatment plan might still cure the cancer, or at least shrink it enough to help you live longer and feel better. But when a person has tried many different treatments and the cancer has not gotten any better, the cancer tends to become resistant to all treatment. If this happens, it's important to weigh the possible limited benefits of a new treatment against the possible downsides. Everyone has their own way of looking at this.

This is likely to be the hardest part of your battle with cancer -- when you have been through many medical treatments and nothing's working anymore. Your doctor may offer you new options, but at some point you may need to consider that treatment is not likely to improve your health or change your outcome or survival.

If you want to continue to get treatment for as long as you can, you need to think about the odds of treatment having any benefit and how this compares to the possible risks and side effects. In many cases, your doctor can estimate how likely it is the cancer will respond to treatment you are considering. For instance, the doctor may say that more chemo or radiation might have about a 1% chance of working. Some people are still tempted to try this. But it is important to think about and understand your reasons for choosing this plan.

No matter what you decide to do, you need to feel as good as you can. Make sure you are asking for and getting treatment for any symptoms you might have, such as nausea or pain. This type of treatment is called palliative care.

Palliative care helps relieve symptoms, but is not expected to cure the disease. It can be given along with cancer treatment, or can even be cancer treatment. The difference is its purpose - the main purpose of palliative care is to improve the quality of your life, or help you feel as good as you can for as long as you can. Sometimes this means using drugs to help with symptoms like pain or nausea. Sometimes, though, the treatments used to control your symptoms are the same as those used to treat cancer. For instance, radiation might be used to help relieve bone pain caused by cancer that has spread to the bones. Or chemo might be used to help shrink a tumor and keep it from blocking the bowels. But this is not the same as treatment to try to cure the cancer. You can learn more about the changes that occur when curative treatment stops working, and about planning ahead for yourself and your family, in our documents Nearing the End of Life and Advance Directives. You can read them online or call us to have free copies mailed to you.

At some point, you may benefit from hospice care. This is special care that treats the person rather than the disease; it focuses on quality rather than length of life. Most of the time, it is given at home. Your cancer may be causing problems that need to be managed, and hospice focuses on your comfort. You should know that while getting hospice care often means the end of treatments such as chemo and radiation, it doesn't mean you can't have treatment for the problems caused by your cancer or other health conditions. In hospice the focus of your care is on living life as fully as possible and feeling as well as you can at this difficult time. You can learn more about hospice in our document called *Hospice Care*.

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

What's new in penile cancer research and treatment?

Since penile cancer is an uncommon disease in this country, it is hard 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, 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 have looked at using different drugs to treat penile cancer, such as irinotecan (Camptosar®) and interferon. One drug being studied now is dacomitinib. This drug targets a protein called *EGFR*, and it has side effects that are different from traditional chemotherapy.

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.

Learning more about these abnormal genes in penile cancer can also help guide use of targeted therapies. Targeted therapy is a term used for drugs that target certain cell changes and signals that are needed for a cancer to develop and keep growing. Targeted cancer therapies do not damage bone marrow or blood cells like most standard chemo drugs do. They can be used alone or along with other drugs and cancer treatments. Targeted therapy is still relatively new compared with other forms of cancer treatment, like surgery, radiation, or regular chemo.

These treatments have been helpful in treating some kinds of cancer, but not as much is known about the value of these new drugs in penile cancer, because penile cancer is so rare. There have been a few cases of advanced penile cancer in which doctors chose targeted therapies that are effective against cancers with cells similar to those of penile cancer. Preliminary results suggest some value, but more research is needed.

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 and anal cancer. While it has not yet been studied, the hope is that the vaccine may eventually help prevent other cancers linked to HPV in men, including penile cancers.

Additional resources for penile cancer

More information from your American Cancer Society

Here is more information you might find helpful. You also can order free copies of our documents from our toll-free number, 1-800-227-2345, or read them on our website, www.cancer.org.

Living with Cancer

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

Distress in People With Cancer

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

Guide to Controlling Cancer Pain (also available in Spanish)

Living With Uncertainty: The Fear of Cancer Recurrence

When Cancer Doesn't Go Away

When Your Cancer Comes Back: Cancer Recurrence

Understanding cancer treatments

Understanding Cancer Surgery: A Guide for Patients and Families (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)

Family and caregiver concerns

Talking With Friends and Relatives About Your Cancer (also in Spanish)

What It Takes to Be a Caregiver

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

Helping Children When a Family Member Has Cancer: Dealing With Diagnosis (also available in Spanish)

Work, insurance, and finances

Health Insurance and Financial Assistance for the Cancer Patient

Returning to Work After Cancer Treatment

Working During Cancer Treatment

Your American Cancer Society also has books that you might find helpful. Call us at 1-800-227-2345 or visit our bookstore online to find out about costs or to place an order.

National organizations and websites*

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

American Association of Sexuality Educators and Therapists (AASECT)
Phone: (202) 449-1099
Website: aasect.org

> Offers books, online articles, and resources on sexuality. Also offers an online locator to help you find a therapist with expertise in sexuality

National Cancer Institute
Toll-free number: 1-800-422-6237 (1-800-4-CANCER)
Website: www.cancer.gov

> Provides information on all types of cancer, living with cancer, support information for families of people with cancer, research, and more

National Coalition for Cancer Survivorship
Toll-free number: 1-877-622-7937 (1-877-NCCS-YES)
Website: www.canceradvocacy.org

> Offers information on work, health insurance, and more. The Cancer Survival Toolbox is a free, self-learning audio program to help cancer survivors and caregivers develop practical tools needed to deal with the diagnosis, treatment and challenges of cancer. Listen online or order CDs. Also in Spanish and Chinese.

**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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Last Medical Review: 12/6/2013
Last Revised: 2/6/2014

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