VAGINAL CANCER

What is cancer?

Cancer develops when cells in a part of the body begin to grow out of control. Although there are many kinds of cancer, they all start because of out-of-control growth of abnormal cells.

Normal body cells grow, divide, and die in an orderly fashion. During the early years of a person's life, normal cells divide more rapidly until the person becomes an adult. After that, cells in most parts of the body divide only to replace worn-out or dying cells and to repair injuries.

Because cancer cells continue to grow and divide, they are different from normal cells. Instead of dying, they outlive normal cells and continue to form new abnormal cells.

Cancer cells develop because of damage to DNA. This substance is in every cell and directs all its activities. Most of the time when DNA becomes damaged the body is able to repair it. In cancer cells, the damaged DNA is not repaired. People can inherit damaged DNA, which accounts for inherited cancers. Many times though, a person’s DNA becomes damaged by exposure to something in the environment, like smoking.

Cancer usually forms as a tumor. Some cancers, like leukemia, do not form tumors. Instead, these cancer cells involve the blood and blood-forming organs and circulate through other tissues where they grow.

Often, cancer cells travel to other parts of the body, where they begin to grow and replace normal tissue. This process is called metastasis. Regardless of where a cancer may spread, however, it is always named for the place it began. For instance, breast cancer that spreads to the liver is still called breast cancer, not liver cancer.

Not all tumors are cancerous. Benign (non-cancerous) tumors do not spread (metastasize) to other parts of the body and, with very rare exceptions, are not life threatening.

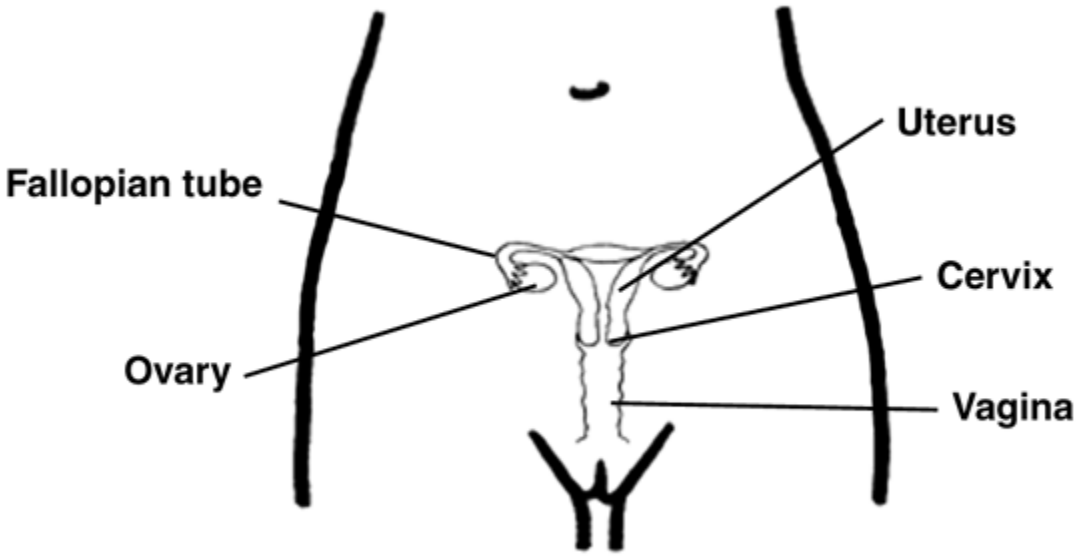
Different types of cancer can behave very differently. For example, lung cancer and breast cancer are very different diseases. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their particular kind of cancer.

Cancer is the second leading cause of death in the United States. Nearly half of all men and a little over one third of all women in the United States will develop cancer during their lifetimes. Today, millions of people are living with cancer or have had cancer. The risk of developing most types of cancer can be reduced by changes in a person's lifestyle, for example, by quitting smoking and eating a better diet. The sooner a cancer is found and treatment begins, the better are the chances for living for many years.

What is vaginal cancer?

The vagina is a 3 to 4 inch (7 1/2 to 10 cm) tube. It is sometimes called the birth canal. The vagina goes from the cervix (the lower part of the uterus) to open up at the vulva (the external genitals). The vagina is lined by a layer of flat cells called *squamous* cells. This layer of cells is also called *epithelium* (or epithelial lining) because it is formed by epithelial cells.

The vaginal wall underneath the epithelium contains connective tissue, muscle tissue, lymph vessels, and nerves. The vagina is usually in a collapsed state with its walls touching each other. The vaginal walls have many folds that help the vagina to open and expand during sexual intercourse or the birth of a baby. Glands near the opening of the vagina secrete mucus to keep the vaginal lining moist.



Types of vaginal cancer

There are several types of vaginal cancer.

Squamous cell carcinoma

About 70% of vaginal cancers are *squamous cell carcinomas***.** These cancers begin in the squamous cells that make up the epithelial lining of the vagina. These cancers are more common in the upper area of the vagina near the cervix. Squamous cell cancers of the vagina are often slow to develop. First, some of the normal cells of the vagina acquire pre-cancerous changes. Then some of the pre-cancer cells turn into cancer cells. This process can take many years.

The medical term most often used for this pre-cancerous condition is vaginal intraepithelial neoplasia (VAIN). "Intraepithelial" means that the abnormal cells are only found in the surface layer of the vaginal skin (epithelium). VAIN is often divided into 3 categories -- VAIN1, VAIN2, and VAIN3, with higher numbers indicating furthest progression toward a true cancer. VAIN is more common in women who have had their uterus removed (hysterectomy) and in those who were previously treated for cervical cancer or pre-cancer.

In the past, the term *dysplasia* had been used instead of VAIN. This term is used much less now. When talking about dysplasia, there is also a range of increasing progress toward cancer - first, mild dysplasia; next, moderate dysplasia; and then severe dysplasia.

Adenocarcinoma

Cancer that begins in gland cells is called *adenocarcinoma*. This type of cancer makes up about 15% of vaginal cancers. The usual type of vaginal adenocarcinoma typically develops in women older than 50. One certain type, called clear cell adenocarcinoma, occurs more often in young women who were exposed to diethylstilbestrol (DES) in utero (when they were in their mother’s womb). (See the section "What are the risk factors for vaginal cancer?" for more information on DES and clear cell carcinoma.)

Malignant melanoma

Melanoma is a cancer that develops from pigment-producing cells called melanocytes. These cancers usually are found on sun-exposed areas of the skin but can form on the vagina or other internal organs. They account for about 9% of all vaginal cancers. Melanoma tends to affect the lower or outer portion of the vagina. The tumors vary greatly in size, color, and growth pattern.

Sarcoma

A sarcoma is a cancer that begins in the cells of bones, muscles, or connective tissue. Up to 4% of vaginal cancers are sarcomas. These cancers form deep in the wall of the vagina, not on its surface. There are several types of vaginal sarcomas. *Rhabdomyosarcoma* is the most common type of vaginal sarcoma. It is most often found in children and is rare in adults. A sarcoma called *leiomyosarcoma* is seen more often in adults. It tends to occur in women older than 50.

Other cancers

Cancers of the vagina are much less common than cancers that start in other organs (such as the cervix, uterus, rectum, or bladder) and then spread to the vagina. These cancers are named after the place where they started. Also, a cancer that involves both the cervix and vagina is considered a cervical cancer. Likewise, if the cancer involves both the vulva and the vagina, it is considered a vulvar cancer. This document refers only to cancers that start in the vagina, also known as *primary* vaginal cancers.

What are the key statistics about vaginal cancer?

Vaginal cancer is rare and accounts for only about 1% of cancers of the female reproductive system. The American Cancer Society estimates that in the year 2009, about 2,160 new cases of vaginal cancer will be diagnosed in the United States and 770 women will die of this cancer.

The 5-year survival rate refers to the percentage of patients who live at least 5 years after their cancer is diagnosed. Five-year rates are used to produce a standard way of discussing prognosis. Of course, many people live much longer than 5 years. Five-year relative survival rates assumes that people will die of other causes and compares the observed survival with that expected for people without vaginal cancer. That means that relative survival only talks about deaths from vaginal cancer.

For all cases of vaginal cancer combined, the relative 5-year survival is about 50%. For squamous cell carcinoma of the vagina, the relative 5-year survival is 54%, while for adenocarcinoma of the vagina it is almost 60%. For vaginal melanoma, 5-year relative survival is only 13%.

What are the risk factors for vaginal 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 cancer of the lung and many other 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. And not having any risk factors doesn't mean that you won't get it, either.

Scientists have found that certain risk factors make a woman more likely to develop vaginal cancer. Even if a woman with vaginal cancer has one or more risk factors, it is impossible to know for sure how much that risk factor contributed to causing the cancer. And many women with vaginal cancer do not have any apparent risk factors.

Age

Squamous cell cancer of the vagina occurs mainly in older women. Only 15% of cases are found in women younger than 40. Almost half of cases occur in women who are 70 years old or older.

Diethylstilbestrol (DES)

DES is a hormonal drug that was given to some women to prevent miscarriage during the years between 1940 and 1971. Women whose mothers took DES (when pregnant with them) develop clear-cell adenocarcinoma of the vagina or cervix more often than would normally be expected. There is about 1 case of this type of cancer in every thousand women whose mother took DES during their pregnancy. This means that about 99.9% of "DES daughters" do not develop this cancer.

DES-related clear cell adenocarcinoma is more common in the vagina than the cervix. The risk appears to be greatest in those whose mothers took the drug during their first 16 weeks of pregnancy. The average age at diagnosis is 19 years. Since the use of DES during pregnancy was stopped by the FDA in 1971, even the youngest DES daughters are older than 35 - past the age of highest risk. But there is no age when a woman is safe from DES-related cancer. Doctors do not know exactly how long women remain at risk.

Although DES daughters have an increased risk of developing clear cell carcinomas, women don’t have to be exposed to DES for clear cell carcinoma to develop. In fact, cases of the disease were diagnosed before DES was invented.

Vaginal adenosis

Normally, the vagina is lined by flat cells called squamous cells. In about 40% of women who have already started periods, the vagina may contain one or more areas where it is lined instead by glandular cells. These cells look like those found in the glands of the cervix, or the lining the body of the uterus (endometrium), or the lining of the fallopian tubes. This change is called *adenosis*. It occurs in nearly all women who were exposed to DES during their mothers' pregnancy. Having adenosis increases the risk of developing clear cell carcinoma, but this cancer is still very rare. The risk of clear cell carcinoma in a woman who has adenosis that is not related to DES is very, very small. Still, many doctors feel that any woman with adenosis should have very careful screening and follow-up.

Human papillomavirus infection

Up to 90% of vaginal cancers and pre-cancers (vaginal intraepithelial neoplasia -- VAIN) contain the human papillomavirus (HPV). 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 known as warts. Different HPV types can cause different types of warts in different 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 female and male genital organs and the anal area. HPV can be passed from one person to another during skin-to-skin contact. It can be spread during sex -- including vaginal intercourse, anal intercourse, and even during oral sex.

Certain types of HPV have been strongly associated with vaginal cancers. These types, HPV types 16 and 18, also cause cervical cancer. Different HPV types cause genital warts. Most cases of genital warts are caused by 2 HPV types: HPV 6 and HPV 11.

HPV infections occur mainly in young women and are less common in women over 30. The reason for this is not clear. Infection with HPV can be present for years without any symptoms, so the absence of visible warts cannot be used to tell if someone has HPV. Even when someone doesn't have warts (or any other symptom), he (or she) can still be infected with HPV and pass the virus to somebody else.

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

Certain types of sexual behavior increase a woman's risk of getting HPV infection. These include starting to have sex at an early age, having many sexual partners, having sex with a person who has had many partners, and having unprotected sex at any age.

Vaccines have been developed to help prevent infection with some types of HPV. Right now, there is an HPV vaccine that has been approved for use in the United States by the Food and Drug Administration (FDA). This

vaccine is called Gardasil®, and it protects against HPV types 6, 11, 16, and 18. It also helps prevent cancers of the cervix, vulva, and vagina. More HPV vaccines are being developed and tested.

Cervical cancer

Having cervical cancer or pre-cancer (cervical intraepithelial neoplasia or cervical dysplasia) increases a woman's risk of vaginal squamous cell cancer. This is most likely because cervical and vaginal cancers have similar risk factors, such as HPV infection and smoking.

Some studies suggest that treating cervical cancer with radiation therapy may increase the risk of vaginal cancer, but this was not seen in other studies, and the issue remains unresolved.

Smoking

Smoking cigarettes more than doubles a woman's risk of getting vaginal cancer.

Alcohol

Alcohol intake may affect the risk of vaginal cancer. A study of alcoholic women found more cases of vaginal cancer than was expected. But this study was flawed because it didn't look at other factor that can alter risk, such as smoking and HPV infection. A more recent study that did take these other risk factors into account found a decreased risk of vaginal cancer in women who do not drink alcohol at all .

HIV infection

HIV (human immunodeficiency virus), the virus that causes AIDS, also increases the risk of vaginal cancer.

Vaginal irritation

In some women, stretching of the pelvic ligaments may cause the uterus to sag into the vagina or even extend outside the vagina. This condition is called uterine prolapse and can be treated by surgery or by wearing a pessary, a device to keep the uterus in place. Some studies suggest that long-term (chronic) irritation of the vagina in women using a pessary may slightly increase the risk of squamous cell vaginal cancer. But this association is extremely rare, and no studies have conclusively proven that pessaries actually cause vaginal cancer.

Do we know what causes vaginal cancer?

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

Research has shown that substances called tumor suppressor gene products are made by normal cells to prevent them from growing too rapidly and becoming cancers. Two proteins (E6 and E7) produced by high-risk (like 16 and 18) HPV (human papilloma virus) types can interfere with the functioning of known tumor suppressor gene products.

As mentioned in the section on risk factors, women exposed to diethylstilbestrol (DES) as a fetus (that is, their mothers took DES during pregnancy) are at increased risk for developing clear cell carcinoma. DES also increases the likelihood of vaginal adenosis (gland-type cells in the vaginal lining rather than the usual squamous cells). Most women with vaginal adenosis never develop vaginal clear cell carcinoma. However, those with a rare type of adenosis (called atypical tuboendometrial adenosis) do have an increased risk of developing this cancer.

Can vaginal cancer be prevented?

The best way to reduce the risk of vaginal cancer is to avoid known risk factors and to find and treat any vaginal pre-cancers. But since many women with vaginal cancer have no known risk factors, it is not possible to completely prevent this disease.

Avoiding risk factors

HPV infection

Infection with human papillomavirus (HPV) is risk factor for vaginal cancer. HPV infections occur mainly in young women and are less common in women over 30. The reason for this is not entirely clear. But most of these infections in young women disappear, in some cases the HPV DNA remains inside cells of a woman's cervix and vagina. This can lead to pre-cancerous changes and even to cancer many years later.

Certain types of sexual behavior increase a woman's risk of getting HPV infection, such as:

- having sex at an early age
- having many sex partners
- having a partner who has had many sex partners
- having sex with uncircumcised males

Delaying sex until you are older can help you avoid HPV. It also helps to limit your number of sex partners and to avoid having sex with someone who has had many other sex partners. Uncircumcised men seem to be more likely to have the virus and be able to pass it on to someone else. Remember that HPV can be present for years with no symptoms -- it does not always cause warts or any other symptoms. Someone can have the virus and pass it on without knowing it.

Condoms provide some protection against HPV. One study found that when condoms are used correctly they can lower the HPV infection rate by about 70% -- if they are used every time sex occurs. Condoms cannot protect completely because they don't cover every possible HPV-infected area of the body, such as skin of 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.

Vaccines have been developed to help prevent infection with some types of HPV. Right now, there is an HPV vaccine that has been approved for use in the United States by the Food and Drug Administration (FDA). This vaccine is called Gardasil®, and it protects against HPV types 6, 11, 16, and 18. Gardasil is recommended for use in young women before they start having sex. This vaccine was designed to lower the risk of cervical cancers and pre-cancers, but it also prevents vulvar and vaginal cancers (and pre-cancers) caused by HPV 16 and 18. Other HPV vaccines are being developed and tested.

Smoking

Not smoking is another way to lower vaginal cancer risk. Women who don't smoke are also less likely to develop a number of other cancers, such as those of the lungs, mouth, throat, bladder, kidneys, and several other organs.

Detecting pre-cancerous conditions

Most vaginal squamous cell cancers are believed to start out as pre-cancerous changes, called vaginal intraepithelial neoplasia (VAIN). VAIN may be present for years before turning into a true (invasive) cancer. These pre-cancers can be found with the same Pap test that is used to screen for cervical cancer and pre-cancer. If a pre-cancer is found, it can be treated, stopping cancer before it really starts.

The American Cancer Society recommends:

> All women should begin cervical cancer screening about 3 years after they start having sex (vaginal intercourse), A woman who waits until she is over 18 to have sex should start screening no later than age 21. Screening should be done every year with the regular Pap test or every 2 years using the newer liquid-based Pap test.
>
> Beginning at age 30, women who have had 3 normal Pap test results in a row may be screened less often -- every 2 to 3 years. Testing can be with either the conventional (regular) or liquid-based Pap test. Some women should continue getting tested yearly -- such as those who were exposed to diethylstilbestrol (DES) before birth, and those with a weakened immune system (from HIV infection, an organ transplant, chemotherapy, or chronic steroid use)..
>
> Another reasonable option for women over 30 is to get screened every 3 years (but not more frequently) with either the conventional or liquid-based Pap test, *plus* the HPV DNA test.
>
> Women 70 years of age or older who have had 3 or more normal Pap tests in a row and no abnormal Pap test results in the last 10 years may choose to stop having cervical cancer screening. Women with a history of cervical cancer, DES exposure before birth, HIV infection or a weakened immune system should continue to have screening as long as they are in good health.
>
> Women who have had a total hysterectomy (the uterus and cervix are removed) may also choose to stop having cervical cancer screening, unless the surgery was done as a treatment for cervical cancer or pre-cancer. Women who have had a hysterectomy without removing the cervix should continue to follow the guidelines above.

How Pap tests and pelvic examinations are done

First, the skin of the outer lips (labia majora) and inner lips (labia minora) is examined for any visible abnormalities. Then the health care professional inserts a speculum, a metal or plastic instrument that keeps the vagina open so that the cervix and vagina can be seen clearly. Next, a sample of cells and mucus is lightly scraped from the exocervix (part next to the vagina) using a spatula. A small brush or a cotton-tipped swab is used to sample the endocervix (the inside part of the cervix that is closest to the body of the uterus). There are 2 main options, conventional cytology and liquid-based cytology, for preparing the cell samples so that they can be examined under a microscope in the laboratory.

Conventional cytology

The first option is to smear the sample directly onto a glass microscope slide, which is then sent to the laboratory. For about 50 years, all cervical cytology (Pap test) samples were handled this way. This method works quite well and is relatively inexpensive, but it does have some drawbacks. One problem with this method is that the cells smeared onto the slide are sometimes piled up on each other, making it hard to see the cells at the bottom of the pile. Also, white blood cells (pus), increased mucus, yeast cells, or bacteria from infection or inflammation can hide the cervical/vaginal cells. Another problem with direct smears is that if the slides are not treated (with a preservative) right away, the cells can get dried out. This can make it difficult to tell if there is something wrong with the cells. The Pap test may need to be repeated if the cells cannot be seen well (due to any of the above problems).

Liquid-based cytology

Another method is to put the sample of cells directly into a special preservative liquid (instead of putting them on a slide directly). This is then sent to the lab. Technicians use special lab instruments that spread some of the cells in the liquid onto glass slides to look at under the microscope. This method is called liquid-based cytology, or a liquid-based Pap test. The liquid helps remove some of the mucus, bacteria, yeast, and pus cells in a sample. It also allows the cells to be spread more evenly on the slide and keeps them from drying out and becoming distorted. Cells kept in the liquid can also be tested for HPV. Using liquid-based testing reduces the chance that the Pap test will need to be repeated, but it does not seem to find more pre-cancers than a regular Pap test. The liquid based test is also more likely to find cell changes that are not pre-cancerous but that will need to be checked out further -- leading to unnecessary tests. This newer method is more expensive than a usual Pap test.

No matter which way is used, the slides are looked at by specially trained technologists (cytotechnologists) and doctors (pathologists). Another way to improve the Pap test by using computerized instruments that can spot abnormal cells in Pap smears. A machine that can read Pap tests has been approved by the US Food and Drug Administration (FDA) to read Pap tests first (instead of them being examined by a technologist). It is also approved by the FDA for rechecking Pap test results that were read as normal by technologists. Any smear identified as abnormal by the machine would then be reviewed by a doctor or a technologist.

After the Pap test, the speculum is removed. The doctor then will check the organs of the pelvis by inserting 1 or 2 gloved fingers of one hand into the vagina while he or she palpates (feels) the lower abdomen, just above the pubic bone, with the other. The doctor may include a rectal exam at this time also.

Vaginal intraepithelial neoplasia (VAIN; pre-cancer of the vagina) usually can't be seen during a routine exam of the vagina. This is why the Pap test is so important. Because cervical cancer is much more common than vaginal cancer, Pap test samples are scraped or brushed from the cervix. However, some cells of the vaginal lining are usually also picked up at the same time. That allows many cases of VAIN to be found in women whose vaginal lining is not intentionally scraped. Of course, in women whose cervix has been removed by surgery, Pap test samples are purposely taken from the lining of the upper vagina.

Many women with VAIN may also have a pre-cancer of the cervix (known as cervical intraepithelial neoplasia or CIN). If abnormal cells are seen on a Pap test, the next step is a procedure called colposcopy, in which the cervix, the vagina, and at times the vulva are examined with a special instrument called a colposcope.

Can vaginal cancer be found early?

Many cases of vaginal cancer can be found early in the course of the disease.

Some early vaginal cancers may produce symptoms that cause patients to seek medical attention, but many vaginal cancers do not cause symptoms until after they have reached an advanced stage. Pre-cancerous areas of vaginal intraepithelial neoplasia (VAIN) do not usually produce any symptoms. Fortunately, most cases of VAIN and early invasive vaginal cancer can be found by routine Pap testing.

How is vaginal cancer diagnosed?

If a woman has any of the signs or symptoms of vaginal cancer, she should see a doctor. If the Pap test detects abnormal cells, or if the pelvic exam is not normal, more tests will be needed. This may mean referral to a gynecologist (specialist in problems of the female genital system).

Signs and symptoms of vaginal cancer

Between 80% and 90% of women with invasive vaginal cancer have one or more symptoms, such as:

- abnormal vaginal bleeding (often after intercourse)
- abnormal vaginal discharge
- a mass that can be felt
- pain during intercourse

Painful urination, constipation, and continuous pain in the pelvis may occur with advanced vaginal cancer.

Having these symptoms does not always mean that you have cancer. In fact, these symptoms are more likely to be caused by a benign condition, like an infection. The only way to know for sure what is causing these problems is to see your health care professional. If you have any of these symptoms, discuss them with your doctor right away. Remember, the sooner you receive a correct diagnosis, the sooner you can start treatment, and the more effective your treatment will be.

Medical history and physical exam

The first step is to take a complete medical history to check for risk factors and symptoms. Then your doctor will perform a complete physical exam, including a pelvic exam with a Pap test.

Colposcopy

If certain symptoms suggest cancer or if the Pap test shows abnormal cells, you will need to have a test called colposcopy. In this procedure you will lie on the exam table as you do with a pelvic exam. A speculum is placed in the vagina. The doctor will use the colposcope to examine the cervix and vagina. The colposcope is an instrument with magnifying lenses (like binoculars), that allows the doctor to see the vaginal walls and the surface of the cervix closely and clearly. Sometimes a weak solution of acetic acid (similar to vinegar) or iodine is applied to make any abnormal areas easier to see.

Colposcopy is not painful, has no side effects, and can be done safely even if you are pregnant. If an abnormal area is seen on the cervix, a biopsy will be done.

Biopsy

If a suspicious area is found, the doctor will do a *biopsy*. For a biopsy, a small sample of tissue or cells from an abnormal area is removed and sent to a laboratory. There, a pathologist (a doctor specializing in laboratory diagnosis of diseases) looks at the tissue under a microscope to see if cancer is present. A biopsy is the only way to tell for certain whether an abnormal area is a pre-cancer, a true cancer, or something else.

Imaging tests

Chest x-ray

A plain x-ray of your chest may be done to see if your cancer has spread to your lungs. This is very unlikely unless your cancer is far advanced.

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, as does a conventional x-ray, a CT scanner takes many pictures as it rotates around you. A computer then combines these pictures into an image of a slice of your body (think of a loaf of sliced bread). The machine will take pictures of multiple slices of the part of your body that is being studied.

Before any pictures are taken, you may be asked to drink 1 to 2 pints of a liquid called "oral contrast." This helps outline the intestine so that certain areas are not mistaken for tumors. You may also receive an IV (intravenous) line through which a different kind of contrast dye (IV contrast) is injected. This helps better outline structures in your body.

The injection can cause some flushing (redness and warm feeling that may last hours to days). A few people are allergic to the dye and get hives. Rarely, more serious reactions like trouble breathing and low blood pressure can occur. Medicine can be given to 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.

CT scans take longer than regular x-rays and you will need to lie still on a table while they are being done. Also, you might feel a bit confined by the ring-like equipment you're in when the pictures are being taken.

A CT scan can provide information about the size, shape, and position of a tumor, and can be helpful to see if the cancer has spread to other organs. It can also help find enlarged lymph nodes that might contain cancer.

CT scans can also be used to precisely guide a biopsy needle into a suspected area of cancer spread. For this procedure, called a CT-guided needle biopsy, you remain on the CT scanning table while a doctor moves a biopsy needle toward the mass. CT scans are repeated until the doctor is sure that the needle is inside the mass. A fine needle biopsy sample (tiny fragment of tissue) or a core needle biopsy sample (a thin cylinder of tissue about ½ inch long and less than 1/8 inch in diameter) is removed and looked at under a microscope.

Magnetic resonance imaging (MRI)

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. Not only does this produce cross sectional slices of the body like a CT scanner, it can also produce slices that are parallel with the length of your body.

Sometimes a contrast material is injected into a vein to help better see some structures in the body. The contrast used for MRI is different than the one used for CT, so being allergic to one does not mean that you are allergic to the other. MRI scans are a little more uncomfortable than CT scans. First, they take longer -- often up to an hour. Also, you have to be placed inside a tube, which is confining and can upset people with claustrophobia (a fear of close spaces). Newer, "open MRI" machines can help people with this fear. The machine also makes a thumping noise that many people find annoying. Some places will provide headphones with music to block this out.

MRI images are particularly useful in examining pelvic tumors. They may often detect enlarged lymph nodes in the groin. They are also helpful in detecting cancer that has spread to the brain or spinal cord. This rarely occurs in vaginal cancer.

Positron emission tomography

Positron emission tomography (PET) uses glucose (a form of sugar) that contains a radioactive atom. Because cancers use glucose (sugar) at a higher rate than normal tissues, the radioactivity tends to concentrate in the cancer. A special camera is used to detect the radioactivity. This test can be helpful for spotting small collections of cancer cells, and can be useful to see if the cancer has spread to lymph nodes. PET scans are also useful when your doctor thinks the cancer has spread, but doesn't know where. PET scans can be used instead of several different x-rays because they scan your whole body. Newer devices combine a CT scan and a PET scan to even better pinpoint the tumor.

Endoscopic tests

These tests are not often used to evaluate women with vaginal cancer.

Proctosigmoidoscopy

Proctosigmoidoscopy is a procedure to view the rectum and part of the colon. It is done to check for spread of vaginal cancer to the rectum or colon. In this procedure a slender, flexible, hollow, lighted tube is placed into the rectum. Any areas that look suspicious will be biopsied. This test may be somewhat uncomfortable, but it should not be painful. Proctosigmoidoscopy may be recommended for patients whose vaginal cancers are large and/or located in the part of the vagina next to the rectum and colon.

Cystoscopy

Cystoscopy is a procedure to view the inside of the bladder. It is done to check for spread of vaginal cancer to the bladder. This procedure can be done in the doctor's office or clinic. You may be given an intravenous medication to make you drowsy. A thin tube with a lens and light is inserted into the bladder through the opening called the urethra. If suspicious areas or growths are seen, a biopsy will be done. Cystoscopy may be recommended if a vaginal cancer is large and/or located in the front wall of the vagina, near the bladder.

How is vaginal cancer diagnosed?

If a woman has any of the signs or symptoms of vaginal cancer, she should see a doctor. If the Pap test detects abnormal cells, or if the pelvic exam is not normal, more tests will be needed. This may mean referral to a gynecologist (specialist in problems of the female genital system).

Signs and symptoms of vaginal cancer

Between 80% and 90% of women with invasive vaginal cancer have one or more symptoms, such as:

- abnormal vaginal bleeding (often after intercourse)
- abnormal vaginal discharge
- a mass that can be felt
- pain during intercourse

Painful urination, constipation, and continuous pain in the pelvis may occur with advanced vaginal cancer.

Having these symptoms does not always mean that you have cancer. In fact, these symptoms are more likely to be caused by a benign condition, like an infection. The only way to know for sure what is causing these problems is to see your health care professional. If you have any of these symptoms, discuss them with your doctor right away. Remember, the sooner you receive a correct diagnosis, the sooner you can start treatment, and the more effective your treatment will be.

Medical history and physical exam

The first step is to take a complete medical history to check for risk factors and symptoms. Then your doctor will perform a complete physical exam, including a pelvic exam with a Pap test.

Colposcopy

If certain symptoms suggest cancer or if the Pap test shows abnormal cells, you will need to have a test called colposcopy. In this procedure you will lie on the exam table as you do with a pelvic exam. A speculum is placed in the vagina. The doctor will use the colposcope to examine the cervix and vagina. The colposcope is an instrument with magnifying lenses (like binoculars), that allows the doctor to see the vaginal walls and the surface of the cervix closely and clearly. Sometimes a weak solution of acetic acid (similar to vinegar) or iodine is applied to make any abnormal areas easier to see.

Colposcopy is not painful, has no side effects, and can be done safely even if you are pregnant. If an abnormal area is seen on the cervix, a biopsy will be done.

Biopsy

If a suspicious area is found, the doctor will do a *biopsy*. For a biopsy, a small sample of tissue or cells from an abnormal area is removed and sent to a laboratory. There, a pathologist (a doctor specializing in laboratory diagnosis of diseases) looks at the tissue under a microscope to see if cancer is present. A biopsy is the only way to tell for certain whether an abnormal area is a pre-cancer, a true cancer, or something else.

Imaging tests

Chest x-ray

A plain x-ray of your chest may be done to see if your cancer has spread to your lungs. This is very unlikely unless your cancer is far advanced.

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, as does a conventional x-ray, a CT scanner takes many pictures as it rotates around you. A computer then combines these pictures into an image of a slice of your body (think of a loaf of sliced bread). The machine will take pictures of multiple slices of the part of your body that is being studied.

Before any pictures are taken, you may be asked to drink 1 to 2 pints of a liquid called "oral contrast." This helps outline the intestine so that certain areas are not mistaken for tumors. You may also receive an IV

(intravenous) line through which a different kind of contrast dye (IV contrast) is injected. This helps better outline structures in your body.

The injection can cause some flushing (redness and warm feeling that may last hours to days). A few people are allergic to the dye and get hives. Rarely, more serious reactions like trouble breathing and low blood pressure can occur. Medicine can be given to 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.

CT scans take longer than regular x-rays and you will need to lie still on a table while they are being done. Also, you might feel a bit confined by the ring-like equipment you're in when the pictures are being taken.

A CT scan can provide information about the size, shape, and position of a tumor, and can be helpful to see if the cancer has spread to other organs. It can also help find enlarged lymph nodes that might contain cancer.

CT scans can also be used to precisely guide a biopsy needle into a suspected area of cancer spread. For this procedure, called a CT-guided needle biopsy, you remain on the CT scanning table while a doctor moves a biopsy needle toward the mass. CT scans are repeated until the doctor is sure that the needle is inside the mass. A fine needle biopsy sample (tiny fragment of tissue) or a core needle biopsy sample (a thin cylinder of tissue about ½ inch long and less than 1/8 inch in diameter) is removed and looked at under a microscope.

Magnetic resonance imaging (MRI)

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. Not only does this produce cross sectional slices of the body like a CT scanner, it can also produce slices that are parallel with the length of your body.

Sometimes a contrast material is injected into a vein to help better see some structures in the body. The contrast used for MRI is different than the one used for CT, so being allergic to one does not mean that you are allergic to the other. MRI scans are a little more uncomfortable than CT scans. First, they take longer -- often up to an hour. Also, you have to be placed inside a tube, which is confining and can upset people with claustrophobia (a fear of close spaces). Newer, "open MRI" machines can help people with this fear. The machine also makes a thumping noise that many people find annoying. Some places will provide headphones with music to block this out.

MRI images are particularly useful in examining pelvic tumors. They may often detect enlarged lymph nodes in the groin. They are also helpful in detecting cancer that has spread to the brain or spinal cord. This rarely occurs in vaginal cancer.

Positron emission tomography

Positron emission tomography (PET) uses glucose (a form of sugar) that contains a radioactive atom. Because cancers use glucose (sugar) at a higher rate than normal tissues, the radioactivity tends to concentrate in the cancer. A special camera is used to detect the radioactivity. This test can be helpful for spotting small collections of cancer cells, and can be useful to see if the cancer has spread to lymph nodes. PET scans are also useful when your doctor thinks the cancer has spread, but doesn't know where. PET scans can be used instead of several different x-rays because they scan your whole body. Newer devices combine a CT scan and a PET scan to even better pinpoint the tumor.

Endoscopic tests

These tests are not often used to evaluate women with vaginal cancer.

Proctosigmoidoscopy

Proctosigmoidoscopy is a procedure to view the rectum and part of the colon. It is done to check for spread of vaginal cancer to the rectum or colon. In this procedure a slender, flexible, hollow, lighted tube is placed into the rectum. Any areas that look suspicious will be biopsied. This test may be somewhat uncomfortable, but it should not be painful. Proctosigmoidoscopy may be recommended for patients whose vaginal cancers are large and/or located in the part of the vagina next to the rectum and colon.

Cystoscopy

Cystoscopy is a procedure to view the inside of the bladder. It is done to check for spread of vaginal cancer to the bladder. This procedure can be done in the doctor's office or clinic. You may be given an intravenous medication to make you drowsy. A thin tube with a lens and light is inserted into the bladder through the opening called the urethra. If suspicious areas or growths are seen, a biopsy will be done. Cystoscopy may be recommended if a vaginal cancer is large and/or located in the front wall of the vagina, near the bladder.

How is vaginal cancer staged?

Staging is the process of finding out how far the cancer has spread. It is very important because your treatment options and the outlook for your recovery and survival (prognosis) depend on the stage of your cancer.

The stage of most vaginal cancers is most often described using the *FIGO* (International Federation of Gynecology and Obstetrics) System of Staging combined with the American Joint Committee on Cancer TNM system. This system classifies the diseases in Stages 0 through IV depending on the extent of the tumor (T), whether the cancer has spread to lymph nodes (N) and whether it has spread to distant sites (M for metastasis). Vaginal melanoma is not staged using this system. It is staged like melanoma of the skin. Information about melanoma staging can be found in our document, *Melanoma Skin Cancer*.

Tumor extent (T)

Tis: The cancer is not invading into the underlying tissues.
T1: The cancer is only in the vagina.
T2: The cancer has grown through the vaginal wall, but not as far as the pelvic wall.
T3: The cancer is growing into the pelvic wall.
T4: The cancer is growing into the bladder or rectum or is growing out of the pelvis.

Lymph node spread of cancer (N)

N0: No lymph node spread
N1: Spread to lymph nodes in the pelvis or groin (inguinal region)

Distant spread of cancer (M)

M0: No distant spread
M1: The cancer has spread to distant sites.

Stage 0 (Tis, N0, M0)

In this stage, cancer cells are only in the top layer of cells lining the vagina (the epithelium) and have not grown into the deeper layers of the vagina. Cancers of this stage cannot spread to other parts of the body. Stage 0 vaginal cancer is also called *carcinoma in situ* (CIS) or vaginal intraepithelial neoplasia 3 (VAIN 3).

Stage I (T1, N0, M0)

The cancer has grown through the top layer of cell but it has not grown out of the vagina and into nearby structures. It has not spread to nearby lymph nodes or to distant sites.

Stage II (T2, N0, M0)

The cancer has spread to the connective tissues next to the vagina but has not spread to the wall of the pelvis, to other organs, or to lymph nodes. (The pelvis is the internal cavity that contains the internal female reproductive organs, rectum, bladder, and parts of the large intestine.)

Stage III (T1,2, N1, M0; or T3, any N, M0)

Cancer has spread to the wall of the pelvis (T3) and/or to lymph nodes nearby (N1). It has not spread to distant sites.

Stage IVA (T4, Any N, M0)

Cancer has spread to organs next to the vagina (such as the bladder or rectum). It may or may not have spread to lymph nodes. It has not spread to distant sites.

Stage IVB (Any T, Any N, M1)

Cancer has spread to distant organs such as the lungs.

FIGO stages

FIGO staging is largely based on the size and extent of the tumor (T):

T1 is FIGO stage I
T2 is FIGO stage II
T3 is FIGO stage III
T4 is FIGO stage IVA
Cancer that has spread to distant sites (M1) is FIGO stage IVB

Survival by stage

The 5-year survival rate refers to the percentage of patients who live at least 5 years after their cancer is diagnosed. Five-year rates are used to produce a standard way of discussing prognosis. Of course, many people live much longer than 5 years. Five-year relative survival rates assumes that people will die of other causes and compares the observed survival with that expected for people without vaginal cancer. That means that relative survival only talks about deaths from vaginal cancer. The numbers below are based on patients with vaginal cancer diagnosed from 1988 to 2001.

AJCC Stage	Relative 5-Year Survival Rate
I	68%
II	54%
III	36%
IV	20%

Keep in mind that 5-year survival rates are based on patients diagnosed and initially treated more than 5 years ago. Improvements in treatment may result in a more favorable outlook for women more recently diagnosed with vaginal cancer.

How is vaginal 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.

After the diagnostic tests are done, your cancer care team will recommend a treatment plan. Don't feel rushed about considering your options. If there is anything you do not understand, ask to have it explained again. The choice of treatment depends largely on the type of cancer and stage of the disease when it is diagnosed.

Other factors might play a part in choosing the best treatment plan. These could include your age, your overall state of health, whether you plan to have more children, and other personal considerations. Be sure you understand all the risks and side effects of the various therapies before making a decision about treatment.

You may want to get a second opinion. This can provide more information and help you feel confident about the treatment plan you choose. Some insurance companies require a second opinion before they will pay for treatments.

The 2 main methods of treatment of invasive vaginal cancer are radiation therapy and surgery. Chemotherapy in combination with radiation may be used to treat advanced disease (see section on chemotherapy). Some other treatments are available to treat pre-cancers of the vagina (VAIN).

Whenever possible, treatment is given with the intention of completely removing or destroying the cancer. If a cure is not possible, the goal may be to remove or destroy much of the cancer in order to prevent the tumor from growing, spreading, or returning for as long as possible. If the cancer has spread widely, the main goal of treatment is palliation (relieving pain, blockage of the urinary or intestinal system, or other symptoms).

Laser surgery

In this treatment, a beam of high-energy light is used to vaporize the abnormal tissue. This is a very effective treatment for VAIN, and works well for large lesions. However, this is not a treatment for invasive cancer. For laser surgery to be an option, the doctor must be certain that the worst lesion was biopsied and that invasive cancer is not a concern.

Topical therapy

Topical therapy is when the drug is applied directly onto the cancer. This is another way to treat VAIN, but is not used to treat invasive vaginal cancer.

One choice is to apply the chemotherapy drug, fluorouracil (5-FU), directly to the lining of the vagina. This is repeated weekly for about 10 weeks or given nightly for 1 to 2 weeks. This treatment has drawbacks. It can cause severe vaginal and vulvar irritation. Also, it may not be work as well using the laser or simply removing the lesion with surgery.

A second drug that can be used topically is called imiquimod. This drug comes in a cream to be applied to the area of VAIN. Imiquimod is not chemotherapy drug. Instead, it acts by boosting the body's immune response to the area of abnormal tissue. This treatment has led to improvement of VAIN (the lesions changed from VAIN 2 or 3 to VAIN 1). In some women, it has caused VAIN to go away completely.

Radiation therapy

Radiation therapy uses high-energy rays (or particles) to destroy cancer cells. Radiation therapy is the preferred method of treating most cancers of the vagina.

There are several ways to deliver radiation therapy. The most common way is to carefully focus a radiation beam from a machine outside the body. This is known as external beam radiation. External beam radiation therapy usually involves having treatments 5 days a week for a period of 6 weeks or so.

Another way to deliver radiation is to place radioactive material inside the vagina. This is called intracavitary brachytherapy or internal radiation therapy. The 2 main types of intracavitary brachytherapy are low-dose rate and high-dose rate. For the low-dose rate treatment, the radioactive material is inside a cylindrical container that is placed in the vagina and stays in place for a day or two. Although gauze packing helps hold the cylinder in place, you have to remain in bed (in the hospital) during the treatment. With high dose-rate intracavitary brachytherapy, the radiation source doesn't need to stay in place for long. This allows it to be given in an outpatient setting. Three or four treatments are given 1 or 2 weeks apart. With these intracavitary methods, radiation mainly affects the tissue in contact with the cylinder. This lowers the chance of bladder and bowel side effects.

Another type of brachytherapy, called *interstitial radiation*, uses radioactive material inside needles that are placed directly into the cancer and surrounding tissues.

Side effects of radiation therapy

Radiation can destroy nearby healthy tissue along with the cancerous cells. Side effects depend on the area being treated, the amount of radiation, and the way that the radiation is given. Side effects tend to be more severe for external beam radiation than for brachytherapy.

Common radiation side effects include skin changes, fatigue, nausea, or diarrhea. Skin changes from radiation range from mild temporary redness to permanent discoloration. The skin may become raw and tender. It may also release fluid, making infection more likely, so care must be taken to clean and protect the area exposed to radiation.

Radiation to the pelvis can also cause severe irritation of the intestines and rectum (called radiation colitis), leading to diarrhea and bloody stool. If severe, radiation colitis can cause holes or tears forming in the intestines (called perforations).

Pelvic radiation can also cause problems with the bladder (radiation cystitis), leading to discomfort and an urge to urinate often. In rare cases, radiation can cause abnormal connections to form between the vagina and the bladder, rectum, or uterus (these are called fistulas).

Radiation can cause the normal tissue of the vagina to become irritated and sore. It may also cause scar tissue to form in the vagina. The scar tissue can make the vagina shorter or more narrow (this is called vaginal stenosis). When this happens, sex (vaginal intercourse) can become painful. Stretching the walls of the vagina a few times a week can help prevent this problem. One way to do this is to have vaginal intercourse at least 3 to 4 times a week. Another option is to use a vaginal dilator. A dilator is a plastic or rubber tube used to stretch out the vagina. It feels much like putting in a large tampon for a few minutes. Even if a woman is not interested in staying sexually active, keeping her vagina normal in size allows comfortable gynecologic exams. This is an important part of follow-up after treatment. Vaginal estrogens may also be used to relieve dryness, painful

intercourse and help maintain the size of the vagina. Still, vaginal dryness and pain with intercourse can be long-term side effects from radiation. Pelvic radiation can also damage the ovaries, leading to menopause in some women.

Radiation to the pelvis can also weaken the bones, making them more likely to break from a fall or other trauma.

Surgery

Surgery is usually only used for small stage I tumors and for cancers that were not cured by radiation. Surgery is also used for sarcomas and melanomas.

The extent of the surgery depends on the size and stage of the cancer.

Local excision

In this procedure, the surgeon removes the cancer along with a surrounding rim of normal tissue. This sometimes called a wide excision. For VAIN a local excision may be all that is needed. .For small stage I cancers, treatment may include a radical wide local excision along with a procedure to evaluate the lymph nodes.

Vaginectomy

Vaginectomy is surgery to remove the vagina. If only part of the vagina is removed, it is called a partial vaginectomy. If the entire vagina is removed, it is called a total vaginectomy. A radical vaginectomy is when the vagina is removed along with the supporting tissues around it.

Hysterectomy

Vaginal cancer is most often found in the upper part of the vagina (near the cervix), so removing the cancer sometimes means also removing the uterus and cervix. If only the cervix is removed (leaving the uterus behind), it is called a *trachelectomy*. When both the uterus and cervix are removed, the operation is called a *hysterectomy* or total hysterectomy (TH). In operations done for cancer, the connective tissue that surrounds and supports the uterus is often removed as well. In that case, the operation is called a *radical* hysterectomy. There are 2 major ways to remove the uterus. If it is removed through the vagina it is called a vaginal hysterectomy (or VH). If the uterus is removed through an incision in the abdomen, it is called an abdominal hysterectomy (or total abdominal hysterectomy -- TAH). The fallopian tubes and ovaries are often removed in the same operation. This procedure is known as a bilateral salpingo-oophorectomy (or BSO). You may see the abbreviation TAHBSO, which stands for total abdominal hysterectomy bilateral salpingo-oophorectomy.

Vaginal reconstruction

If all or most of the vagina must be removed, it is possible to reconstruct (rebuild) a vagina with tissue from another part of the body, which will allow a woman to have intercourse. A new vagina can be surgically created out of skin, intestinal tissue, or myocutaneous (muscle and skin) grafts.

A reconstructed vagina produces little or no natural lubricant when a woman becomes sexually excited. A woman should prepare for intercourse by using a lubricating gel inside the vagina. If the vagina was rebuilt using muscle and skin from the leg, touching the new vagina may make a woman feel as though her thigh is being stroked. This is because the walls of the vagina are still attached to their original nerve supply. Over time, these feelings become less distracting and may even become sexually stimulating. (For more information about the impact of vaginal reconstruction, see our document, *Sexuality for the Woman With Cancer*

Lymphadenectomy

Lymphadenectomy is the removal of lymph nodes. It is sometimes called lymph node dissection. For vaginal cancer, lymph nodes from the groin area or from inside the pelvis near the vagina may be removed to check for cancer spread.

Removing lymph nodes in the groin or pelvis can result in poor fluid drainage from the legs. The fluid builds up, leading to leg swelling that is severe and doesn't go down at night. This is called lymphedema. Support stockings or special compression devices may help reduce swelling. Women with lymphedema need to be very careful to avoid infection in the affected leg or legs.

Pelvic exenteration

A pelvic exenteration combines a radical hysterectomy and vaginectomy with removal of some of the organs in the pelvis. It can include removing the bladder, rectum, and/or part of the colon. How much has to be removed depends on how far the cancer has spread.

If the bladder is removed, a new way to store and get rid of urine is needed. Usually a short segment of intestine is used to function as a new bladder. This may be connected to the abdominal wall so that urine is drained periodically when the woman places a catheter into a small opening (called a urostomy). Or urine may drain continuously into a small plastic bag attached to the front of the abdomen over the opening.

If the rectum and part of the colon are removed, a new way to eliminate solid waste is needed. This is done by attaching the remaining intestine to the abdominal wall so that stool can pass through a small opening (called a colostomy) into a small plastic bag worn on the front of the abdomen. Sometimes it's possible to remove a piece of the colon and then reconnect it. In that case, no bags or external appliances are needed.

Pelvic exenteration is rarely needed to treat vaginal cancer -- less extensive surgery is usually able to control the cancer. This procedure may be used for vaginal cancers that have come back after treatment with radiation therapy. It is also sometimes needed to treat vaginal cancers when radiation therapy cannot be used. This occurs when women were treated with radiation for cervical cancer in the past. That is because treating the same area with radiation more than once can cause severe complications.

Chemotherapy

Chemotherapy (or chemo) is the use of drugs for treating cancer. Most often, the drugs are swallowed in pill form or injected into a vein or muscle. This is called systemic chemotherapy. If the chemotherapy is applied directly to the cancer, it is known as topical chemotherapy.

In systemic chemotherapy, the drug enters the bloodstream and circulates throughout the body to reach and destroy the cancer cells. So far, systemic chemotherapy has not been shown to work well in treating vaginal cancer. It may be helpful as a way to shrink tumors before surgery. Chemo is also sometimes given with radiation to make the radiation work better.

Systemic chemotherapy can reach cancer cells in just about any place inside the body, but the drugs can also affect some normal, healthy cells. This is what causes some of the side effects of chemotherapy. Careful attention is given to avoid or reduce the side effects of chemotherapy. These side effects depend on the type and dose of drugs given and the length of time they are taken.

Many of the drugs used in cancer chemotherapy are designed to attack cells that are rapidly dividing - such as cancer cells. However, the cells in some tissues also grow rapidly to replace cells that wear out. The cells of these tissues, such as the bone marrow, the lining of the mouth and intestines, and the hair follicles, are most likely to be affected by chemotherapy. This can lead to:

- hair loss
- mouth sores
- loss of appetite
- diarrhea
- nausea and vomiting
- lowered resistance to infection (due to low white blood cell counts)
- easy bruising or bleeding (due to low blood platelets)
- fatigue (due to low red blood cells)

These side effects are temporary and go away after treatment is finished.

Some chemo drugs can also cause long-term side effects. The drug cisplatin, for example, can damage nerves (called neuropathy). This can lead to decreased sensation, numbness, tingling, or even pain in the hands or feet. These symptoms may improve after treatment is stopped, but may never go away completely. If you will be getting chemo, it is important to talk with your doctor about the drugs you will get and what side effects to expect.

.If you have side effects, your cancer care team can suggest steps to ease their impact. For example, drugs can be given along with the chemotherapy to prevent or reduce nausea and vomiting.

In the past, chemotherapy has been mainly used to treat women with advanced cancer. Some doctors suggest that it be given along radiation for women with less advanced disease (like it is used for cervical cancer). Some small groups of patients have been reported to have been treated this way, but using combined chemo and radiation has not yet been compared to other, more standard treatments in a clinical trial.

When chemo is given, the treatment is similar to that used for cervical cancer. Drugs that have been used include cisplatin, fluorouracil (5-FU), paclitaxel (Taxol), and docetaxel (Taxotere).

Clinical trials

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

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

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

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

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

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

Complementary and alternative therapies

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

What exactly are complementary and alternative therapies?

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

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

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

Finding out more

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

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

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

The choice is yours

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

Treatment options by stage and type of vaginal cancer

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

Vaginal intraepithelial neoplasia (VAIN)

Many cases of low-grade VAIN (VAIN 1) will go away on their own, so some doctors will choose to watch them closely without starting treatment. This involves getting repeat Pap tests often with colposcopy as needed. If the area of VAIN doesn't go away or gets worse, treatment is started. VAIN 2 is not likely to go away on its own, so treatment is usually started right away.

VAIN is treated using topical therapy (like 5-FU or imiquimod) or laser treatment, Rarely, surgery is used to remove the lesion. It may be chosen to if other treatments fail or if the doctor wants to be sure that the area isn't invasive cancer. Surgery may involve a wide local excision - removing the abnormal area with a rim of surrounding normal tissue. A partial vaginectomy (removal of part of the vagina) is rarely needed to treat VAIN.

Stage 0 (VAIN 3 or CIS)

The usual treatment options are laser vaporization, or local excision of the affected areas. Intracavitary radiation may be used; shrinkage of the vagina is a possible side effect.

Topical chemotherapy (5-FU cream) can be used but repeated applications are needed. This treatment can cause severe irritation of the vagina and vulva.

If the cancer comes back again after these treatments, surgery (partial vaginectomy) may be needed. The surgeon would remove the entire tumor and enough surrounding normal tissue to ensure that is doesn't come back.

Stage I

Squamous cell cancers: Radiation therapy is used for most stage I vaginal cancers. If the cancer is less than 5 mm thick (about 3/16 inch), intracavitary radiation is used. Interstitial radiation is an option for some tumors, but it is not often used Intracavitary radiation may be combined with external beam radiation for larger tumors.

Lesions in the upper vagina may also be treated by a radical hysterectomy, bilateral radical pelvic lymph node removal, and radical or partial vaginectomy.

Removing part or the entire vagina is an option for some cancers (partial or radical vaginectomy). Reconstructive surgery to create a new vagina after treatment of the cancer is an option if a large portion of the vagina has been removed.

Following a radical partial of complete vaginectomy, postoperative radiation (external beam) may be needed to treat tiny deposits of cancer cells that have spread to lymph nodes in the pelvis.

Adenocarcinomas: For cancers in the upper part of the vagina, the treatment is surgery. This would be a radical hysterectomy, partial or radical vaginectomy, and removal of pelvic lymph nodes. This can be followed by reconstructive surgery if needed or desired. Radiation therapy may be given as well.

For cancers lower down in the vagina, one choice is to give both either interstitial or intracavitary radiation therapy and external radiation beam therapy. The lymph nodes in the groin and/or pelvis are treated with external beam radiation therapy.

Another approach is to combine surgery and radiation. Surgery is done to remove the cancer (a wide local radical excision) and the lymph nodes draining the cancer (the pelvic and/or groin nodes). The cervix, uterus, and ovaries are left in place. Then intracavitary or interstitial radiation therapy is given. This works as well as radical surgery or higher doses of radiation in treating the cancer. The advantage of this approach is that in most cases the ovaries continue to function and the woman is still able to bear children. This is an important consideration because many women with vaginal adenocarcinoma are young.

Stage II

The usual treatment is radiation, using a combination of brachytherapy and external beam radiation.

Radical surgery (radical vaginectomy or pelvic exenteration) is an option for some patients with stage II vaginal squamous cell cancer if it is small and in the upper vagina. It is also used to treat women who have already had radiation therapy for cervical cancer and who would not be able to tolerate additional radiation without severe damage to normal tissues.

Chemotherapy with radiation may also be used to treat stage II disease.

Stage III or IVA

The usual treatment is radiation therapy, often with both brachytherapy and external beam radiation. Curative surgery is generally not attempted. Chemotherapy may be combined with radiation to help it work better.

Stage IVB

Since the cancer has spread to distant sites, it cannot be cured. Patients often receive radiation therapy to the vagina and pelvis to improve symptoms and reduce bleeding. . Chemotherapy may also be given, but it has not been shown to help patients live longer. Because there is no accepted treatment, often the best option is to enroll in a clinical trial.

Recurrent squamous cell cancer or adenocarcinoma of the vagina

If a cancer comes back after treatment it is called recurrent. If the cancer comes back in the same area as it was in the first place, it is called a local recurrence. If it comes back in another area (like the liver or lungs), it is called a distant recurrence.

A local recurrence of a stage I or stage II vaginal cancer may be treated with radical surgery (such as pelvic exenteration). If the cancer was originally treated with surgery, radiation therapy is an option. Surgery is the usual choice when the cancer has come back after radiation therapy.

Higher-stage cancers are difficult to treat when they recur. They usually cannot be cured by currently available treatments. Care focuses mostly on relieving symptoms, although participation in a clinical trial of new treatments may be helpful.

For a distant recurrence, the goal of treatment is to help the woman feel better. Surgery, radiation, or chemotherapy may be used. Again, a clinical trial is a good option.

Melanoma

Just as for melanomas found elsewhere in the body, surgery is the main treatment for vaginal melanoma. Because vaginal melanoma is very rare, it hasn't been well studied. Doctors are still not certain about how much tissue needs to be removed to have the best chance of cure. One choice is to remove the cancer and a margin of the normal tissue around it. This is how a melanoma found on the skin of an arm or leg would be treated.

Another option is to remove the entire vagina with some tissue from nearby organs. Some (or all) of the lymph nodes that drain the area of the tumor are also removed and checked for cancer spread.

There are a few drugs that can be helpful in treating metastatic melanoma, but this disease rarely responds well to chemotherapy. Radiation therapy may also be used for melanoma that has spread. It is most often used for spread to the brain or spinal cord. A good option for women with metastatic vaginal melanoma is to receive treatment as a part of a clinical trial. For more information on melanoma, see our document *Melanoma Skin Cancer* , which discusses the biology and treatment of melanoma and the role of lymph node surgery and treatment of advanced disease.

Rhabdomyosarcoma

Treatment of rhabdomyosarcoma is discussed in our separate document, *Rhabdomyosarcoma.*

More treatment information

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

What should you ask your doctor about vaginal cancer?

As you deal with your cancer and the treatment process, you need to have frank, open discussions with your cancer care team. You should feel free to ask any question that's on your mind, no matter how trivial it might seem. Among the questions you might want to ask are:

- What kind of vaginal cancer do I have?
- Has my cancer spread beyond the primary site?
- What is the stage of my cancer? What does the staging mean in my case?
- What treatment choices do I have?
- Based on what you've learned about my cancer, how long do you think I'll survive?
- What side effects can I expect from my treatment?
- How long will it take me to recover from treatment?
- When can I go back to work after treatment?
- Will I be able to have sex after treatment? What reconstructive surgery, if any, will I need?
- What are the chances that my cancer will come back?
- What should I do to be ready for treatment?
- Should I get a second opinion?

You will no doubt have other questions about your own personal situation. Be sure to write your questions down so that you remember to ask them during each visit with your cancer care team. Keep in mind, too, that doctors are not the only ones who can provide you with information. Other health care professionals, such as nurses and social workers, may have the answers you seek.

What happens after treatment for vaginal cancer?

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

It may take a while before your confidence in your own recovery begins to feel real and your fears are somewhat relieved. Even with no recurrences, people who have had cancer learn to live with uncertainty.

Follow-up care

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

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

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

It is also important to keep medical insurance. Even though no one wants to think of their cancer coming back, it is always a possibility. If it happens, the last thing you want is to have to worry about paying for treatment. Should your cancer come back our document, *When Your Cancer Comes Back: Cancer Recurrence* gives you information on how to manage and cope with this phase of your treatment. You can get this document by calling 1-800-ACS-2345.

Treatment to the vagina can leave its tissue fragile and prone to injury. Follow-up will require examination of these tissues for injury or tightening and scarring. In some cases, women will be advised to use vaginal dilators, which a woman inserts in her vagina to gently stretch her vaginal tissue to correct any lack of an elastic quality of the tissue. This can improve her vaginal tissue in becoming more elastic and normal over time.

Seeing a new doctor

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

- a copy of your pathology report from any biopsy or surgery
- if you had surgery, a copy of your operative report

- if you were hospitalized, a copy of the discharge summary that every doctor must prepare when patients are sent home from the hospital
- a copy of your radiation treatment report
- finally, since some drugs can have long-term side effects, a list of your drugs, drug doses, and when you took them

Lifestyle changes to consider during and after treatment

Having cancer and dealing with treatment can be time-consuming and emotionally draining, but it can also be a time to look at your life in new ways. Maybe you are thinking about how to improve your health over the long term. Some people even begin this process during cancer treatment.

Make healthier choices

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

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

You can start by working on those things that you feel most concerned about. Get help with those that are harder for you. For instance, if you are thinking about quitting smoking and need help, call the American Cancer Society's Quitline® tobacco cessation program at 1-800-ACS-2345.

Diet and Nutrition

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

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

One of the best things you can do after treatment is to put healthy eating habits into place. You will be surprised at the long-term benefits of some simple changes, like increasing the variety of healthy foods you eat. Try to eat 5 or more servings of vegetables and fruits each day. Choose whole grain foods instead of white flour and

sugars. Try to limit meats that are high in fat. Cut back on processed meats like hot dogs, bologna, and bacon. Get rid of them altogether if you can. If you drink alcohol, limit yourself to 1 or 2 drinks a day at the most. And don't forget to get some type of regular exercise. The combination of a good diet and regular exercise will help you maintain a healthy weight and keep you feeling more energetic.

Rest, Fatigue, Work, and Exercise

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

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

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

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

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

If you are very tired, though, you will need to balance activity with rest. It is okay to rest when you need to. It is really hard for some people to allow themselves to do that when they are used to working all day or taking care of a household. (For more information about fatigue, please see the publication, "Cancer Related Fatigue and Anemia Treatment Guidelines for Patients."

Exercise can improve your physical and emotional health.

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

And long term, we know that exercise plays a role in preventing some cancers. The American Cancer Society, in its guidelines on physical activity for cancer prevention, recommends that adults take part in at least 1 physical activity for 30 minutes or more on 5 days or more of the week. Children and teens are encouraged to try for at least 60 minutes a day of energetic physical activity on at least 5 days a week.

How about your emotional health?

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

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

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

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

The cancer journey can feel very lonely. It is not necessary or realistic to go it all by yourself. And your friends and family may feel shut out if you decide not 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-ACS-2345 and we can put you in touch with an appropriate group or resource.

You can't change the fact that you have had cancer. What you can change is how you live the rest of your life -- making healthy choices and feeling as well as possible, physically and emotionally.

What happens if treatment is no longer working?

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

Everyone has his or her own way of looking at this. Some people may want to focus on remaining comfortable during their limited time left.

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

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

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

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

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

Remember also that maintaining hope is important. Your hope for a cure may not be as bright, but there is still hope for good times with family and friends -- times that are filled with happiness and meaning. In a way, pausing at this time in your cancer treatment is an opportunity to refocus on the most important things in your life. This is the time to do some things you've always wanted to do and to stop doing the things you no longer want to do.

What's new in vaginal cancer research and treatment?

Research is underway to find new ways to prevent and treat cancer of the vagina. There are some promising new developments.

Oncogenes and tumor suppressor genes

Scientists are learning more about how certain genes called oncogenes and tumor suppressor genes control cell growth and how changes in these genes cause normal vaginal cells to become cancerous. The ultimate goal of this research is gene therapy, which replaces the damaged genes in cancer cells with normal genes in order to stop the abnormal behavior of these cells. For example, scientists have learned that there is an abnormality of chromosome 3 in many vaginal cancers. Better understanding of how this may play a role in the development of the cancer might lead to better treatment.

HPV vaccines

A vaccine against HPV has recently been shown to reduce the risk of vaginal cancer. Other vaccines are being developed.

Radiation therapy

Studies are underway to determine the best way to combine external beam therapy and brachytherapy to treat the cancer and limit damage to normal tissue.

Reconstructive surgery

Surgeons are developing new operations for repairing the vagina after radical surgery.

Chemotherapy

Doctors have found that vaginal cancer does respond to certain types of chemotherapy. Clinical trials will be needed to find out if combining chemotherapy with radiation therapy is better than radiation therapy alone.

Additional resources

More information from your American Cancer Society

We have selected some related information that may also be helpful to you. These materials may be ordered from our toll-free number, 1-800-ACS-2345 (1-800-227-2345).

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

Caring for the Patient With Cancer at Home (also available in Spanish)

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

Understanding Chemotherapy (also available in Spanish)

Understanding Radiation Therapy (also available in Spanish)

Human Papilloma Virus (HPV), Cancer, and HPV vaccines -- Frequently Asked Questions

Melanoma Skin Cancer

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

American Cancer Society's Guide to Pain Control

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

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

National organizations and Web sites*

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

Gynecologic Cancer Foundation
Toll-free number: 1-800-444-4441
Web site: www.thegcf.org

National Cancer Institute
Toll-free number: 1-800-422-6237 (1-800-4-CANCER); TYY: 1-800-332-8615
Web site: www.cancer.gov

National Coalition for Cancer Survivorship
Toll free number: 1-888-650-9127
Web site: www.canceradvocacy.org

Centers for Disease Control and Prevention (CDC) DES Update
Toll-free number: 1-888-232-6789
Web site: www.cdc.gov/des

**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-ACS-2345** or visit www.cancer.org.

References

American Cancer Society. *Cancer Facts and Figures 2009*. Atlanta, Ga: American Cancer Society; 2009.

Benedetti Panici P, Bellati F, Plotti F, Di Donato V, Antonilli M, Perniola G, Manci N, Muzii L, Angioli R. Neoadjuvant chemotherapy followed by radical surgery in patients affected by vaginal carcinoma. Gynecol Oncol. 2008 Aug 15. [Epub ahead of print].

Daling JR, Madeleine MM, Schwartz SM, et al. A population-based study of squamous cell vaginal cancer: HPV and cofactors. *Gynecol Oncol* 2002; 84:263-270.

Dalrymple JL, Russell AH, Lee SW, Scudder SA, Leiserowitz GS, Kinney WK, Smith LH. Chemoradiation for primary invasive squamous carcinoma of the vagina. *Int J Gynecol Cancer*. 2004 Jan-Feb;14(1):110-7.

Eifel PJ, Berek JS, Markman MA. Cancer of the Cervix, Vagina and Vulva. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*, 8th edition Philadelphia, Pa: Lippincott Williams & Wilkins; 2008:1396-1543.

Flannelly G. Preinvasive diseases of the cervix, vagina, and vulva. In: Gynecologic Cancer: Controversies in Management. Gershenson D, Gore M, McGuire W, Quinn M, Thomas G, editors. Elsevier Science, pp 79-92. 2004.

Garland SM, Hernandez-Avila M, Wheeler CM, Perez G, Harper DM, Leodolter S, Tang GW, Ferris DG, Steben M, Bryan J, Taddeo FJ, Railkar R, Esser MT, Sings HL, Nelson M, Boslego J, Sattler C, Barr E, Koutsky LA; Females United to Unilaterally Reduce Endo/Ectocervical Disease (FUTURE) I Investigators. Quadrivalent vaccine against human papillomavirus to prevent anogenital diseases. *N Engl J Med.* 2007;356:1928-43

Grigsby PW. Vaginal Cancer. In: Gynecologic Cancer: Controversies in Management. Gershenson D, Gore M, McGuire W, Quinn M, Thomas G, editors. Elsevier Science, pp 113-118, 2004.

Kosary CL. Cancer of the Vagina. In: Ries LAG, Young JL, Keel GE, Eisner MP, Lin YD, Horner M-J (editors). SEER Survival Monograph: Cancer Survival Among Adults: U.S. SEER Program, 1988-2001, Patient and Tumor Characteristics. National Cancer Institute, SEER Program, NIH Pub. No. 07-6215, Bethesda, MD, 2007.

Madsen BS, Jensen HL, van den Brule AJ, Wohlfahrt J, Frisch M. Risk factors for invasive squamous cell carcinoma of the vulva and vagina--population-based case-control study in Denmark. *Int J Cancer.* 2008;122:2827-2834.

PDQ database. Vaginal Cancer. Bethesda, Md: National Cancer Institute; 2008. Available at: http://www.cancer.gov/. Accessed October 2008.

Perez CA, Gersell DJ, McGuire WP, Morris M. Vagina. In: Hoskins WJ, Perez CA, Young RC, eds. *Principles and Practice of Gynecologic Oncology*. Philadelphia, Pa: Lippincott Williams & Wilkins; 2000:811-840.

Rotmensch J, Yamada SD. Neoplasms of the vulva and vagina. In: Kufe DW, Pollock RE, Weichselbaum RR, Bast RC, Gansler TS, Holland JF, Frei E. *Cancer Medicine* 6. Hamilton, Ont: BC Decker; 2003. 1769-1777.

Samant R, Lau B, E C, Le T, Tam T. Primary vaginal cancer treated with concurrent chemoradiation using Cis-platinum. *Int J Radiat Oncol Biol Phys.* 2007;69:746-50. Epub 2007 May 18.

Society of Gynecologic Oncologists Clinical Practice Guidelines: Vaginal cancer. *Oncology*. 1998;12:449-452.

Weiderpass E, Ye W, Tamimi R, Trichopolous D, Nyren O, Vainio H, Adami HO. Alcoholism and risk for cancer of the cervix uteri, vagina, and vulva. *Cancer Epidemiol Biomarkers Prev.* 2001;10:899-901.

Last Medical Review: 12/30/2008
Last Revised: 9/14/2009