

Cervical Cancer

The Cervix

The cervix is the lower, narrow part of the uterus (womb). The uterus, a hollow, pear-shaped organ, is located in a woman's lower abdomen, between the bladder and the rectum. The cervix forms a canal that opens into the vagina, which leads to the outside of the body.

What Is Cancer?

Cancer is a group of more than 100 different diseases. They all affect the body's basic unit, the cell. Cancer occurs when cells become abnormal and divide without control or order. Like all other organs of the body, the cervix is made up of many types of cells. Normally, cells divide to produce more cells only when the body needs them. This orderly process helps keep us healthy. If cells keep dividing when new cells are not needed, a mass of tissue forms. This mass of extra tissue, called a growth or tumor, can be benign or malignant.

Benign tumors are not cancer. They can usually be removed and, in most cases, they do not come back. Most important, cells from benign tumors do not spread to other parts of the body. Benign tumors are not a threat to life. Polyps, cysts, and genital warts are types of benign growths of the cervix.

Malignant tumors are cancer. Cancer cells can invade and damage tissues and organs near the tumor. Cancer cells also can break away from a malignant tumor and enter the lymphatic system or the bloodstream. This is how cancer of the cervix can spread to other parts of the body, such as nearby lymph nodes, the rectum, the bladder, the bones of the spine, and the lungs. The spread of cancer is called metastasis.

Cancer of the cervix also may be called cervical cancer. Like most cancers, it is named for the part of the body in which it begins. Cancers of the cervix also are named for the type of cell in which they begin. Most cervical cancers are squamous cell carcinomas. Squamous cells are thin, flat cells that form the surface of the cervix. When cancer spreads to another part of the body, the new tumor has the same kind of abnormal cells and the same name as the original (primary) cancer. For example, if cervical cancer spreads to the bones, the cancer cells in the bones are cervical cancer cells. The disease is called metastatic cervical cancer (it is not bone cancer).

Precancerous Conditions and Cancer of the Cervix

Cells on the surface of the cervix sometimes appear abnormal but not cancerous. Scientists believe that some abnormal changes in cells on the cervix are the first step in a series of slow changes that can lead to cancer years later. That is, some abnormal changes are precancerous; they may become cancerous with time.

When referring to abnormal changes in the cells on the surface of the cervix, one term now used is squamous intraepithelial lesion (SIL). The word "lesion" refers to an area of abnormal tissue; intraepithelial means that the abnormal cells are present only in the surface layer of cells.) Changes in these cells can be divided into two categories:

- **Low-grade SIL** refers to early changes in the size, shape, and number of cells that form the surface of the cervix. Some low-grade lesions go away on their own. However, with time, others may grow larger or become more abnormal, forming a high-grade lesion. Precancerous low-grade lesions also may be called mild dysplasia or cervical intraepithelial neoplasia 1 (CIN 1). Such early changes in the cervix most often occur in women between the ages of 25 and 35 but can appear in other age groups as well.
- **High-grade SIL** means there are a large number of precancerous cells; they look very different from normal cells. Like low-grade SIL, these precancerous changes involve only cells on the surface of the cervix. The cells will not become cancerous and invade deeper layers of the cervix for many months, perhaps years. High-grade lesions also may be called moderate or severe dysplasia, CIN 2 or 3, or carcinoma in situ. They develop most often in women between the ages of 30 and 40 but can occur at other ages as well.

If abnormal cells spread deeper into the cervix or to other tissues or organs, the disease is then called cervical cancer, or invasive cervical cancer. It occurs most often in women over the age of 40.

Early Detection

If all women had pelvic exams and Pap tests regularly, most precancerous conditions would be detected and treated before cancer develops. That way, most invasive cancers could be prevented. Any invasive cancer that does occur would likely be found at an early, curable stage. In a pelvic exam, the uterus, vagina, ovaries, fallopian tubes, bladder, and rectum are examined. These organs are examined for any abnormality in their shape or size. A speculum is used to widen the vagina so that the upper part of the vagina and the cervix are well visualized. The Pap test is a simple, painless test to detect abnormal cells in and around the cervix. A woman should have this test when she is not menstruating; the best time is between 10 and 20 days after the first day of her menstrual period. For about 2 days before a Pap test, she should avoid douching or using spermicidal foams, creams, or jellies or vaginal medicines (except as directed by a physician), which may wash away or hide any abnormal cells.

A Pap test can be done in a doctor's office or a health clinic. A wooden scraper (spatula) and/or a small brush is used to collect a sample of cells from the cervix and upper vagina. The cells are placed on a glass slide and sent to a medical laboratory to be checked for abnormal changes. The way of describing Pap test results is changing. The newest method is the Bethesda System. Changes are described as low-grade or high-grade SIL. Many believe that the Bethesda System provides more useful information than an older system, which uses numbers ranging from class 1 to class 5. (In class 1, the cells in the sample are normal, while class 5 refers to invasive cancer.) Women should have regular checkups, including a pelvic exam and a Pap test, if they are or have been sexually active or if they are age 18 or older. Those who are at increased risk of developing cancer of the cervix should be especially careful to have regular checkups.

Symptoms

Precancerous changes of the cervix usually do **not** cause pain. In fact, they generally do not cause any symptoms and are not detected unless a woman has a pelvic exam and a Pap test. Symptoms usually do not appear until abnormal cervical cells become cancerous and invade nearby tissue. When this happens, the most common symptom is abnormal bleeding. Bleeding may start and stop between regular menstrual periods, or it may occur after sexual intercourse, douching, or a pelvic exam. Menstrual bleeding may last longer and be heavier than usual. Bleeding after menopause also may be a symptom of cervical cancer. Increased vaginal discharge is another symptom of cervical cancer. These symptoms may be caused by cancer or by other health problems.

Diagnosis

The pelvic exam and Pap test are performed to detect abnormal changes in the cervix. If these exams show that an infection is present, it is treated and then the Pap test is repeated at a later time. If the exam or Pap test suggests something other than an infection, the doctor may repeat the Pap test and do other tests to find out what the problem is. Colposcopy is a widely used method to check the cervix for abnormal areas. The doctor applies a vinegar-like solution to the cervix and then uses an instrument much like a microscope (called a colposcope) to look closely at the cervix. An iodine solution (a procedure called the Schiller test) is used to coat the cervix. Healthy cells turn brown; abnormal cells turn white or yellow. These procedures may be done in the doctor's office.

A small amount of cervical tissue is removed (biopsy) for examination by a pathologist. In one type of biopsy, an instrument is used to pinch off small pieces of cervical tissue. Another method used to do a biopsy is called loop electrosurgical excision procedure (LEEP). In this procedure, the doctor uses an electric wire loop to slice off a thin, round piece of tissue. These types of biopsies may be done in the doctor's office using local anesthesia. The doctor also may want to check inside the opening of the cervix, an area that cannot be seen during colposcopy. In a procedure called endocervical curettage (ECC), a curette (a small, spoon-shaped instrument) is used to scrape tissue from inside the cervical opening. These procedures for removing tissue may cause some bleeding or other discharge. However, healing usually occurs quickly. Women also often experience some pain similar to menstrual cramping, which can be relieved with medicine.

These tests may not show for sure whether the abnormal cells are present only on the surface of the cervix.

In that case, a larger, cone-shaped sample of tissue is removed. This procedure, called conization or cone biopsy, allows the pathologist to see whether the abnormal cells have invaded tissue beneath the surface of the cervix. Conization also may be used as treatment for a precancerous lesion if the entire abnormal area can be removed. This procedure requires either local or general anesthesia and may be done in the doctor's office or in the hospital. In a few cases, it may not be clear whether an abnormal Pap test or a woman's symptoms are caused by problems in the cervix or in the endometrium (the lining of the uterus). In this situation, dilation and curettage (D and C) may be indicated. The cervical opening is stretched and a curette is used to scrape tissue from the lining of the uterus as well as from the cervical canal. Like conization, this procedure requires local or general anesthesia and may be done in the doctor's office or in the hospital.

Treating Precancerous Conditions

Treatment for a precancerous lesion of the cervix depends on a number of factors. These factors include whether the lesion is low or high grade, whether the woman wants to have children in the future, the woman's age and general health, and the woman's preference. A woman with a low-grade lesion may not need further treatment, especially if the abnormal area was completely removed during biopsy, but she should have a Pap test and pelvic exam regularly. When a precancerous lesion requires treatment, cryosurgery (freezing), cauterization (burning, also called diathermy), or laser surgery can be used to destroy the abnormal area without harming nearby healthy tissue. Abnormal tissue can be removed by LEEP or conization. Treatment for precancerous lesions may cause cramping or other pain, bleeding, or a watery discharge. In some cases, a woman may have a hysterectomy, particularly if abnormal cells are found inside the opening of the cervix. This surgery is more likely to be done when the woman does not want to have children in the future.

Treating Cancer of the Cervix

STAGING

The choice of treatment for cervical cancer depends on the location and size of the tumor, the stage (extent) of the disease, the woman's age and general health, and other factors. Staging is a careful attempt to find out whether the cancer has spread and, if so, what parts of the body are affected. Blood and urine tests usually are done. A thorough pelvic exam is often performed in the operating room with the patient under anesthesia. During this exam, procedures called cystoscopy and proctosigmoidoscopy may also be performed. In cystoscopy, the bladder is examined with a thin, lighted instrument. Proctosigmoidoscopy is a procedure in which a lighted instrument is used to check the rectum and the lower part of the large intestine. Because cervical cancer may spread to the bladder, rectum, lymph nodes, or lungs, x-rays or tests to check these areas may be ordered. For example, the woman may have a series of x-rays of the kidneys and bladder, called an intravenous pyelogram. The doctor also may check the intestines and rectum using a barium enema. To look for lymph nodes that may be enlarged because they contain cancer cells, a CT or CAT scan may be ordered, which is a series of x-rays put together by a computer to make detailed pictures of areas inside the body. Other procedures that may be used to check organs inside the body are ultrasonography and MRI.

GETTING A SECOND OPINION

Before starting treatment, the patient may want a second pathologist to review the diagnosis and another specialist to review the treatment plan. Some insurance companies require a second opinion; others may cover a second opinion if the patient requests it. It may take a week or two to arrange for a second opinion. This short delay will not reduce the chance that treatment will be successful. There are a number of ways to find a doctor who can give a second opinion: The woman's doctor may be able to suggest pathologists and specialists to consult.

PREPARING FOR TREATMENT

Most women with cervical cancer want to learn all they can about their disease and treatment choices so they can take an active part in decisions about their medical care. Doctors and others on the medical team can help women learn what they need to know. When a person is diagnosed with cancer, shock and stress are natural reactions. These feelings may make it difficult for patients to think of everything they want to ask. Often it helps to make a list of questions. Also, to help remember what the doctor says, patients may take notes or ask whether they may use a tape recorder. Some people also want to have a family member or friend with them when they talk to the doctor--to take part in the discussion, to take notes, or just to listen.

Patients should not feel they need to ask all their questions or remember all the answers at one time. They will have other chances to ask the doctor to explain things and to get more information. Here are some questions a woman with cervical cancer may want to ask the doctor before her treatment begins:

- What is the stage (extent) of my disease?
- What are my treatment choices? Which do you recommend for me? Why?
- What are the chances that the treatment will be successful?
- Would a clinical trial be appropriate for me?
- What are the risks and possible side effects of each treatment?
- How long will treatment last?
- Will it affect my normal activities?
- What is the treatment likely to cost?
- What is likely to happen without treatment?
- How often will I need to have checkups?

METHODS OF TREATMENT

Most often, treatment for cervical cancer involves surgery and radiation therapy. Sometimes, chemotherapy or biological therapy is used. Patients are often treated by a team of specialists. The team may include gynecologic oncologists and radiation oncologists. The doctors may decide to use one treatment method or a combination of methods. Some patients take part in a clinical trial (research study) using new treatment methods. Such studies are designed to improve cancer treatment. More information about clinical trials is in the Clinical Trials section.

Surgery is local therapy to remove abnormal tissue in or near the cervix. If the cancer is only on the surface of the cervix, the doctor may destroy the cancerous cells in ways similar to the methods used to treat precancerous lesions. If the disease has invaded deeper layers of the cervix but has not spread beyond the cervix, the doctor may perform an operation to remove the tumor but leave the uterus and the ovaries. In other cases, however, a woman may need to have a hysterectomy or may choose to have this surgery, especially if she is not planning to have children in the future. In this procedure, the doctor removes the entire uterus, including the cervix; sometimes the ovaries and fallopian tubes also are removed. In addition, the doctor may remove lymph nodes near the uterus to learn whether the cancer has spread to these organs.

Here are some questions a woman may want to ask before surgery:

- What kind of operation will it be?
- How will I feel after the operation?
- If I have pain, how will you help me?
- When can I return to my normal activities?
- How will this treatment affect my sex life?

Radiation therapy (also called radiotherapy) uses high-energy rays to damage cancer cells and stop them from growing. Like surgery, radiation therapy is local therapy; the radiation can affect cancer cells only in the treated area. The radiation may come from a large machine (external radiation) or from radioactive materials placed directly into the cervix (implant radiation). Some patients receive both types of radiation therapy.

A woman receiving external radiation therapy goes to the hospital or clinic each day for treatment. Usually treatments are given 5 days a week for 5 to 6 weeks. At the end of that time, the tumor site very often gets an extra "boost" of radiation. For internal or implant radiation, a capsule containing radioactive material is placed directly in the cervix. The implant puts cancer-killing rays close to the tumor while sparing most of the healthy tissue around it. It is usually left in place for 1 to 3 days, and the treatment may be repeated several times over the course of 1 to 2 weeks. The patient stays in the hospital while the implants are in place.

Here are some questions a woman may want to ask before radiation therapy:

- What is the goal of this treatment?
- How will the radiation be given?
- How long will treatment last?
- How will I feel during therapy?
- What can I do to take care of myself during therapy?
- Can I continue my normal activities?
- How will this treatment affect my sex life?

Chemotherapy is the use of drugs to kill cancer cells. It is most often used when cervical cancer has spread

to other parts of the body. One drug or a combination of drugs may be used. Anticancer drugs used to treat cervical cancer may be given by injection into a vein or by mouth. Either way, chemotherapy is systemic treatment, meaning that the drugs flow through the body in the bloodstream.

Chemotherapy is given in cycles: a treatment period followed by a recovery period, then another treatment period, and so on. Most patients have chemotherapy as an outpatient (at the hospital, at the doctor's office, or at home). Depending on which drugs are given and the woman's general health, however, she may need to stay in the hospital during her treatment.

Here are some questions a woman may want to ask before chemotherapy begins:

- What is the goal of this treatment?
- What drugs will I be taking?
- Do the drugs have side effects? What can I do about them?
- How long will I need to take this treatment?

Biological therapy is treatment using substances to improve the way the body's immune system fights disease. It may be used to treat cancer that has spread from the cervix to other parts of the body. Interferon is the most common form of biological therapy for this disease; it may be used in combination with chemotherapy. Most patients who receive interferon are treated as outpatients.

1.8.5 CLINICAL TRIALS

Some women with cervical cancer are treated in clinical trials, which are conducted to find out whether a new treatment is both safe and effective and to answer scientific questions. Patients who take part in these studies may be the first to receive treatments that have shown promise in laboratory research. Some patients may receive the new treatment while others receive the standard approach. In this way, different therapies can be compared. Patients who take part in a trial make an important contribution to medical science and may have the first chance to benefit from improved treatment methods. Clinical trials of new treatments for cervical cancer are under way. New types and schedules of radiation therapy are being evaluated. They also are looking for new drugs, drug combinations, and ways to combine various types of treatment.

Side Effects of Treatment

It is hard to limit the effects of therapy so that only cancer cells are removed or destroyed. Because treatment also damages healthy cells and tissues, it often causes unpleasant side effects. The side effects of cancer treatment depend mainly on the type and extent of the treatment. Also, each patient reacts differently. Various members of the healthcare team can explain the possible side effects of treatment, and they can help relieve symptoms that may occur during and after treatment. It is important to let the doctor know if any side effects occur.

SURGERY

Methods for removing or destroying small cancers on the surface of the cervix are similar to those used to treat precancerous lesions. Treatment may cause cramping or other pain, bleeding, or a watery discharge.

Hysterectomy is major surgery. For a few days after the operation, the woman may have pain in her lower abdomen. The doctor can order medicine to control the pain. A woman may have difficulty emptying her bladder and may need to have a catheter inserted into the bladder to drain the urine for a few days after surgery. She also may have trouble having normal bowel movements. For a period of time after the surgery, the woman's activities should be limited to allow healing to take place. Normal activities, including sexual intercourse, usually can be resumed in 4 to 8 weeks.

Women who have had their uterus removed no longer have menstrual periods. However, sexual desire and the ability to have intercourse usually are not affected by hysterectomy. On the other hand, many women have an emotionally difficult time after this surgery. A woman's view of her own sexuality may change, and she may feel an emotional loss because she is no longer able to have children. An understanding partner is important at this time.

RADIATION THERAPY

Patients are likely to become very tired during radiation therapy, especially in the later weeks of treatment.

Resting is important, but patients are usually advised to try to stay as active as they can.

With external radiation, it is common to lose hair in the treated area and for the skin to become red, dry, tender, and itchy. There may be permanent darkening or "bronzing" of the skin in the treated area. This area should be exposed to the air when possible but protected from the sun, and patients should avoid wearing clothes that rub the treated area. Patients will be shown how to keep the area clean. They should not use any lotion or cream on their skin without the doctor's advice. Usually, women are told not to have intercourse during radiation therapy or while an implant is in place. However, most women can have sexual relations within a few weeks after treatment ends. Sometimes, after radiation treatment, the vagina becomes narrower and less flexible, and intercourse may be painful. Patients may be taught how to use a dilator as well as a water-based lubricant to help minimize these problems. Patients who receive external or internal radiation therapy also may have diarrhea and frequent, uncomfortable urination, although both can be treated.

CHEMOTHERAPY

The side effects of chemotherapy depend mainly on the drugs and the doses the patient receives. In addition, as with other types of treatment, side effects vary from person to person. Generally, anticancer drugs affect cells that divide rapidly. These include blood cells, which fight infection, help the blood to clot, or carry oxygen to all parts of the body. When blood cells are affected by anticancer drugs, patients are more likely to get infections, may bruise or bleed easily, and may have less energy. Cells in hair roots and cells that line the digestive tract also divide rapidly.

When chemotherapy affects these cells, patients may lose their hair and may have other side effects, such as poor appetite, nausea, vomiting, or mouth sores. Side effects gradually go away during the recovery periods between treatments or after treatment is over, and some can be treated.

BIOLOGICAL THERAPY

The side effects caused by biological therapies vary with the type of treatment the patient receives. These treatments may cause flu-like symptoms such as chills, fever, muscle aches, weakness, loss of appetite, nausea, vomiting, and diarrhea. Sometimes patients get a rash, and they may bleed or bruise easily. These problems can be severe, but they gradually go away after the treatment stops.

Nutrition for Cancer Patients

Some patients find it hard to eat well during cancer treatment. They may lose their appetite. In addition to loss of appetite, the common side effects of treatment, such as nausea, vomiting, or mouth sores, can make eating difficult. For some patients, foods taste different. Also, people may not feel like eating when they are uncomfortable or tired. Eating well during cancer treatment means getting enough calories and protein to help prevent weight loss and regain strength. Patients who eat well often feel better and have more energy. In addition, they may be better able to handle the side effects of treatment.

Follow-up Care

Regular follow-up exams--including a pelvic exam, a Pap test, and other laboratory tests--are very important for any woman who has been treated for precancerous changes or for cancer of the cervix. These tests and exams are performed frequently for several years to check for any sign that the condition has returned. Cancer treatment may cause side effects many years later. For this reason, patients should continue to have regular checkups and should report any health problems that appear.

Support for Cancer Patients

Living with a serious disease is not easy. Cancer patients and those who care about them face many problems and challenges. Coping with these problems is often easier when people have helpful information and support services. Several useful booklets, including the National Cancer Institute booklet *Taking Time*, are available from the Cancer Information Service. Cancer patients may worry about holding their job, caring for their family, keeping up with daily activities, or starting a new relationship. Worries about tests, treatments, hospital stays, and medical bills are common. Doctors, nurses, and other members of the health care team can answer questions about treatment, working, or other activities. Also, meeting with a social worker, counselor, or member of the clergy can be helpful to patients who want to talk about their feelings or discuss their concerns.

Friends and relatives can be very supportive. Also, it helps many patients to discuss their concerns with others who have cancer. Cancer patients often get together in support groups, where they can share what they have learned about coping with cancer and the effects of treatment. It is important to keep in mind, however, that each patient is different. Treatments and ways of dealing with cancer that work for one person may not be right for another--even if they both have the same kind of cancer. It is always a good idea to discuss the advice of friends and family members with member of the healthcare team.

Often, a social worker at the hospital or clinic can suggest groups that can help with rehabilitation, emotional support, financial aid, transportation, or home care. For example, the American Cancer Society has many services for patients and their families. They also offer many free booklets, including one on sexuality and cancer. Local offices of the American Cancer Society are listed in the white pages of the telephone directory.

What the Future Holds

The outlook for women with precancerous changes of the cervix or very early cancer of the cervix is excellent; nearly all patients with these conditions can be cured. Researchers continue to look for new and better ways to treat invasive cervical cancer. Patients and their families are naturally concerned about what the future holds. Sometimes patients use statistics to try to figure out their chances of being cured. It is important to remember, however, that statistics are averages based on large numbers of patients. They cannot be used to predict what will happen to a particular woman because no two patients are alike; treatments and responses vary greatly.

The term remission is often rather than cure when talking about the results of cancer therapy. Although many women with cervical cancer recover completely, these terms are used because the disease can recur.

Cause and Prevention

By studying large numbers of women all over the world, researchers have identified certain risk factors that increase the chance that cells in the cervix will become abnormal or cancerous. They believe that, in many cases, cervical cancer develops when two or more risk factors act together. Research has shown that women who began having sexual intercourse before age 18 and women who have had many sexual partners have an increased risk of developing cervical cancer. Women also are at increased risk if their partners began having sexual intercourse at a young age, have had many sexual partners, or were previously married to women who had cervical cancer. Scientists do not know exactly why the sexual practices of women and their partners affect the risk of developing cervical cancer. However, research suggests that some sexually transmitted viruses can cause cells in the cervix to begin the series of changes that can lead to cancer. Women who have had many sexual partners or whose partners have had many sexual partners may have an increased risk for cervical cancer at least in part because they are more likely to get a sexually transmitted virus.

Scientists are studying the effects of sexually transmitted human papillomaviruses (HPVs). Some sexually transmitted HPVs cause genital warts (*condylomata acuminata*). In addition, scientists believe that some of these viruses may cause the growth of abnormal cells in the cervix and may play a role in cancer development. They have found that women who have HPV or whose partners have HPV have a higher-than-average risk of developing cervical cancer. However, most women who are infected with HPV do not develop cervical cancer, and the virus is not present in all women who have this disease. For these reasons, scientists believe that other factors act together with HPVs. For example, the genital herpes virus also may play a role. Further research is needed to learn the exact role of these viruses and how they act together with other factors in the development of cervical cancer.

Smoking also increases the risk of cancer of the cervix, although it is not clear exactly how or why. The risk appears to increase with the number of cigarettes a woman smokes each day and with the number of years she has smoked.

Women whose mothers were given the drug diethylstilbestrol (DES) during pregnancy to prevent miscarriage also are at increased risk. (This drug was used for this purpose from about 1940 to 1970.) A rare type of vaginal and cervical cancer has been found in a small number of women whose mothers used DES. Several reports suggest that women whose immune systems are weakened are more likely than others to develop cervical cancer. For example, women who have the human immunodeficiency virus (HIV), which causes AIDS, are at increased risk. Also, organ transplant patients, who receive drugs that suppress the immune system to

prevent rejection of the new organ, are more likely than others to develop precancerous lesions.

Some researchers believe that there is an increased risk of cervical cancer in women who use oral contraceptives (the pill). However, scientists have not found that the pill directly causes cancer of the cervix. This relationship is hard to prove because the two main risk factors for cervical cancer--intercourse at an early age and multiple sex partners--may be more common among women who use the pill than among those who do not. Still, oral contraceptive labels warn of this possible risk and advise women who use them to have yearly Pap tests.

Some research has shown that vitamin A may play a role in stopping or preventing cancerous changes in cells like those on the surface of the cervix. Further research with forms of vitamin A may help scientists learn more about preventing cancer of the cervix.

At present, early detection and treatment of precancerous tissue remain the most effective ways of preventing cervical cancer. Information about early detection appears in the Early Detection section. Women should talk with their doctors about an appropriate schedule of checkups. The doctor's advice will be based on such factors as the women's age, medical history, and risk factors.

Credits: National Cancer Institute.

This article is provided by Medem, Inc. All rights reserved.

