PATIENT EDUCATION

The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

Cervical Cancer

An estimated 12,000 new cases of cervical cancer occur each year in the United States, and each year about 4,000 U.S. women will die from this disease. Cervical cancer is largely preventable by having regular cervical cancer screening. About one half of cervical cancer cases occur in women who have never had screening.

If cervical cancer is found and treated early, more than 90% of women who have it can be cured. The more advanced the disease, the lower the cure rate.

This pamphlet explains

- *how cervical cancer develops*
- *who is at risk*
- *symptoms, diagnosis, and staging*
- *treatment and follow-up*

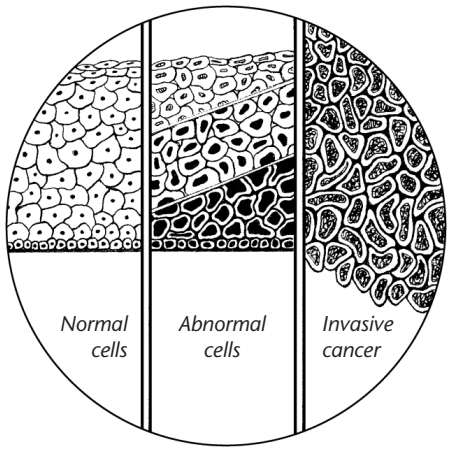
How Cervical Cancer Develops

A woman's ***cervix*** (the opening of the ***uterus*** at the top of the ***vagina***) is covered by a thin layer of tissue made up of ***cells***. Healthy cells grow, divide, and are replaced as needed. Cancer of the cervix occurs when these cells change. Cancer cells divide more rapidly. They may grow into deeper cell layers or spread to other organs. The cancer cells eventually form a mass of tissue called a tumor.

It often takes several years for cervical cancer to develop. During this time, the cells on or around the cervix become abnormal. The early cell changes that occur before cancer is present are called ***dysplasia*** or ***cervical intraepithelial neoplasia (CIN)***. The ***Pap test***, sometimes called cervical cytology screening, checks for abnormal cell changes of the cervix. This allows for early treatment so the abnormal cells do not become cancer.

The Role of Human Papillomavirus

The main cause of cervical cancer is ***human papillomavirus (HPV)*** infection. There are many types of HPV. Some types of HPV, called "high-risk types," can cause cancer of the anus, cervix, vulva, vagina, and penis. They also can cause cancer of the head and neck. Other types have been linked to genital warts.



This enlarged view of cervical cells shows the abnormal growth of certain cells (middle)*, which start to change and grow out of control* (right)*.*

HPV infection is very common. It is passed from person to person through sexual contact. Some research suggests that at least three out of four people who have sex will get a genital HPV infection at some time during their lives. However, being infected with HPV does not necessarily mean that a person will get genital warts or develop cancer.

HPV enters cells and causes them to change and grow abnormally. Usually, a woman's ***immune system*** gets rid of the virus quickly, and the infection goes away by itself. But in a small number of women, HPV does not go away. These infections are described as "persistent." The longer HPV is present and the older the woman, the greater the risk that the virus will damage cervical cells.

A vaccine is available that can prevent infection with HPV. The vaccine protects against the HPV types that are the most common cause of cancer, precancer, and genital warts. Girls and boys should get the HPV vaccine as a series of shots. Vaccination works best when it is done before a person is sexually active and exposed to HPV, but it still can reduce the risk of getting HPV if given after a person has become sexually active. The ideal age for HPV vaccination is age 11 years or 12 years, but it can be given starting at age 9 years and through age 26 years.

An HPV test also is available. It is used to screen for cervical cancer along with the Pap test in women aged 30–65 years and as a follow-up test when screening test results are abnormal or uncertain. It can detect many high-risk types of HPV even before there are visible changes to cervical cells.

Risk Factors

Cancer of the cervix can occur at any age. It occurs most often in women older than 40 years, but it can occur in younger women. However, it rarely occurs in women younger than 21 years.

Your risk of cervical cancer depends on your sexual history, your immune system, your health, and your lifestyle. The most important factor is infection with the types of HPV linked to cancer. The following factors increase your risk of becoming infected with HPV:

- Multiple sexual partners
- Having a male sexual partner who has had multiple sexual partners
- Early age at which you first had sex (younger than 18 years)

Other risk factors include the following:

- A personal history of dysplasia of the cervix, vagina, or vulva
- A family history of cervical cancer
- Smoking
- Certain ***sexually transmitted infections (STIs)***, such as chlamydia

Women who have problems with their immune systems also are at increased risk of cervical cancer, such as women infected with ***human immunodeficiency virus (HIV)*** or who have had an organ transplant.

Women born to mothers who took a drug called diethylstilbestrol (DES) during pregnancy have an increased risk of a rare type of cervical cancer. DES was a drug given to pregnant women between 1940 and 1971 to prevent miscarriage.

Symptoms

Cervical dysplasia and cancer of the cervix often have no symptoms. By the time symptoms appear, the cancer cells may have already spread. When symptoms do occur, the first signs may be abnormal bleeding, spotting, or watery discharge from the vagina. Menstrual bleeding may be heavier than usual, and bleeding may occur after sex. Most of the time, these signs are caused by other health problems besides cancer. However, if you have any of these symptoms, you should see your health care professional.

Signs of advanced cancer can include pelvic pain, problems urinating, and swollen legs. If the cancer has spread to nearby organs or the ***lymph nodes***, the tumors can affect how those organs work. For instance, a tumor might press on your ***bladder*** or block blood flow in a vein. These symptoms do not always mean cancer. If you have any of these symptoms, see your health care professional right away.

Diagnosis

If your health care professional suspects that you have cancer of the cervix, a ***biopsy*** may be done. For certain abnormal Pap test results that require treatment, the abnormal cervical tissue may be removed and sent to a lab to be studied. Cancer can be detected with a Pap test, but a biopsy is needed to be sure.

If cervical cancer is diagnosed, your doctor will assess the size of the cancer and the extent (if any) to which the disease has spread. This process may include the following tests:

- A pelvic exam (which may include a rectal exam)—An examination in which your doctor checks the uterus, ***ovaries***, and other organs near the cervix
- Cystoscopy—A test in which the inside of the ***urethra*** and bladder are studied with a lighted device
- Colonoscopy—A test in which the entire colon is examined with a slender, lighted instrument called a colonoscope

Because cervical cancer can spread to other areas of the body, your doctor may order tests to check these areas. These tests may include X-rays, ***ultrasonography***, ***computed tomography (CT)***, ***magnetic resonance imaging (MRI)***, or ***positron emission tomography (PET)***.

Table 1. Treatment by Stage

Treatment for cervical cancer depends on several factors, such as the stage of the cancer and whether you have other health issues. In early-stage cervical cancer, treatment also is based on whether a woman wants to have more children. The following table lists possible treatment options for cervical cancer. These are general rules for treatment by stage. Your treatment will be based on your diagnosis.

Stage	*Special situations*	*Treatment options*
Stage 0 (carcinoma in situ or CIS)	Desire to have more children	• ***Loop electrosurgical excision procedure (LEEP)*** • ***Laser*** therapy • ***Conization***
	No desire to have more children	• Simple hysterectomy • Internal radiation therapy for women who cannot have surgery
Stage IA1	Desire to have more children	• Conization
	No desire to have more children	• Total hysterectomy with or without removal of the ovaries or lymph nodes
Stage IA2	Desire to have more children	• ***Radical trachelectomy***
	No desire to have more children	• Modified radical hysterectomy and removal of lymph nodes • Internal radiation therapy for women who cannot have surgery
Stage IB and some early Stage II	Desire to have more children	• Radical trachelectomy
	No desire to have more children	• Radical hysterectomy with removal of lymph nodes. Radiation and/or chemotherapy also may be needed. • Radiation therapy and chemotherapy at the same time • Chemotherapy followed by surgery • Radiation therapy alone
Other Stage II and higher	The type of chemotherapy and radiation therapy may differ depending on where the cancer is located	• Radiation therapy with chemotherapy • Surgery to remove lymph nodes followed by radiation with or without chemotherapy • Internal radiation therapy • Clinical trial based on the specific stage and location

Staging

"Staging" is the process of finding out how much the cancer has spread. Most types of cancer have stages from I to IV. The lower the number, the less the cancer has spread.

Some types of cancer, including cervical cancer, have a Stage 0. Stage 0 also is called noninvasive cervical cancer or carcinoma in situ (CIS). In Stage 0, cancer cells are present on the top layer of the cervix only. They have not gone into deeper layers of the cervical tissue or other organs.

The remaining stages are called invasive cancer. In these stages, the cancer has invaded into deeper layers of the cervix. Stage I cervical cancer is when the cancer is only on the cervix. Stage I has several substages. Stage IA is very early cancer. The cancer cells have gone only a few millimeters into the deeper layers of the cervix. Stage IB also is early cancer, but the cells have gone a little further into the cervix. Stages II–III are more advanced stages in which the cancer has spread to the vagina and pelvis. In Stage IV, the cancer has spread to the bladder or rectum or to other organs. Stages II–IV also have substages.

Treatment works best at early stages of cancer. The 5-year survival rate for stage I cancer is 91%. The 5-year survival rate for stage IV cancer is 17%.

Treatment

Your health care professional may consult with or refer you to a gynecologic oncologist (a specialist in cancer of the female reproductive organs) for treatment. You also may be referred to other specialists, such as a radiation oncologist or a medical oncologist. They will work as a team to recommend the best treatment for you.

Types of Treatment

Invasive cancer of the cervix is treated with surgery, ***radiation therapy***, and ***chemotherapy***. The type of treatment chosen depends on the cancer stage (see Table 1). You may receive more than one type of treatment for your cancer.

If surgery is recommended, the goal is to remove the tumor and any tissues where it may spread. In a simple ***hysterectomy***, the cervix and uterus are removed. The ovaries may not be removed if they appear normal. In a radical hysterectomy, the structures that support the uterus and a small part of the upper vagina also are removed. The ovaries, ***fallopian tubes***, and nearby lymph nodes also may be removed.

Radiation therapy stops cancer cells from growing by exposing them to special radiation. Two methods can be used. In one method, radiation from outside of the body is directed at the tumor through the skin. This treatment can require daily visits to a clinic for several weeks. In the second method, a device that directs radiation at the tumor from inside the body is placed in the cervix. This treatment may be done as an outpatient procedure, or it may require a stay in the hospital. Complications of radiation therapy include vaginal dryness, narrowing of the vagina, and damage to the ovaries, bladder, or bowel.

Chemotherapy is the use of cancer-killing drugs. Chemotherapy drugs travel through the blood and destroy different types of cells, including cancer cells. The treatments may be given in cycles either in a doctor's office or clinic, or it may require a hospital stay. It can be given alone or with radiation to make the radiation therapy more successful.

Follow-up

Depending on the stage of cancer and the type of treatment, cervical cancer usually does not return. However, close follow-up is needed. Routine checkups and cervical cancer screening tests are important, even after treatment ends.

Your health care professional may suggest more frequent cervical cancer screening tests for the first few years after treatment to make sure that all the cancer cells were removed. Even if your cervix has been removed to treat your cancer, you still need to have cervical cancer screening. Cells are taken from the upper vagina instead of the cervix.

You also may need other tests and procedures. Your health care professional will work with you to arrange the follow-up care you need.

Finally…

There are many treatments available for cervical cancer. Finding the cancer early, getting prompt treatment, and following a schedule of routine checkups after treatment are essential. If you have questions about your diagnosis or treatment, be sure to ask your health care professional.

Glossary

Biopsy: A minor surgical procedure to remove a small piece of tissue. This tissue is examined under a microscope in a laboratory.

Bladder: A hollow, muscular organ in which urine is stored.

Cells: The smallest units of a structure in the body. Cells are the building blocks for all parts of the body.

Cervical Intraepithelial Neoplasia (CIN): Abnormal changes in the cells of the cervix that are caused by infection with human papillomavirus (HPV). CIN is graded as 1 (low grade), 2 (moderate), or 3 (high grade).

Cervix: The lower, narrow end of the uterus at the top of the vagina.

Chemotherapy: Treatment of cancer with drugs.

Computed Tomography (CT): A type of X-ray that shows internal organs and structures in cross section.

Conization: A procedure that removes a cone-shaped wedge of tissue from the cervix.

Dysplasia: A noncancerous condition that happens when normal cells are replaced by a layer of abnormal cells.

Fallopian Tubes: Tubes through which an egg travels from the ovary to the uterus.

Human Immunodeficiency Virus (HIV): A virus that attacks certain cells of the body's immune system. If left untreated, HIV can cause acquired immunodeficiency syndrome (AIDS).

Human Papillomavirus (HPV): The name for a group of related viruses, some of which cause genital warts and some of which are linked to cancer of the cervix, vulva, vagina, penis, anus, mouth, and throat.

Hysterectomy: Surgery to remove the uterus.

Immune System: The body's natural defense system against viruses and bacteria that cause disease.

Laser: A small, intense beam of light used as a surgical tool.

Loop Electrosurgical Excision Procedure (LEEP): A procedure that removes abnormal tissue from the cervix using a thin wire loop and electric energy.

Lymph Nodes: Small groups of special tissue that carry lymph, a liquid that bathes body cells. Lymph nodes are connected to each other by lymph vessels. Together, these make up the lymphatic system.

Magnetic Resonance Imaging (MRI): A test to view internal organs and structures by using a strong magnetic field and sound waves.

Ovaries: Organs in women that contain the eggs necessary to get pregnant and make important hormones, such as estrogen, progesterone, and testosterone.

Pap Test: A test in which cells are taken from the cervix (or vagina) to look for signs of cancer.

Positron Emission Tomography (PET): An imaging method of viewing organs by tracking a substance in the body.

Radiation Therapy: Treatment with radiation.

Radical Trachelectomy: Surgery to remove the cervix and nearby tissue, lymph nodes, and the upper part of the vagina.

Sexually Transmitted Infections (STI): An infection that is spread by sexual contact. Infections include chlamydia, gonorrhea, human papillomavirus (HPV), herpes, syphilis, and human immunodeficiency virus (HIV, the cause of acquired immunodeficiency syndrome [AIDS]).

Ultrasonography: A test in which sound waves are used to examine inner parts of the body. During pregnancy, ultrasonography can be used to check the fetus.

Urethra: A tube-like structure. Urine flows through this tube when it leaves the body.

Uterus: A muscular organ in the female pelvis. During pregnancy, this organ holds and nourishes the fetus.

Vagina: A tube-like structure surrounded by muscles. The vagina leads from the uterus to the outside of the body.

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