

Human Papillomavirus (HPV) Infection



Infection with human papillomavirus (HPV) is very common in both women and men. More than 100 types of HPV have been found, and about 30 of these types are spread from person to person through sexual contact. Some types of HPV cause genital warts, while others cause cancer of the *cervix*. Two vaccines are available that can protect against some of these HPV types.

This pamphlet explains

- HPV infection and how it is spread
- HPV and genital warts
- HPV and cancer
- screening tests
- preventing HPV infection

What Is Human Papillomavirus?

HPV is a very common virus. 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.

HPV is primarily spread through vaginal, anal, or oral sex, but *sexual intercourse* is not required for infection to occur. HPV is spread by skin-to-skin contact. Sexual contact with an infected partner, regardless of the sex of the partner, is the most common way the virus is spread.

Like many other *sexually transmitted diseases (STDs)*, there often are no signs or symptoms of genital HPV infection. The infected person often is not aware that he or she has been infected.

HPV and Genital Warts

Approximately 12 types of HPV cause genital warts. These types are called “low-risk” HPV types because they are not linked to cancer. Two types, types 6 and 11, are the main cause of genital warts. These growths may appear on the outside or inside of the vagina or on the penis and can spread to nearby skin. Genital warts also can grow around the anus, on the *vulva*, or on the cervix. They can be treated with medication applied to the area or surgery to remove them. The type of treatment depends on where the warts are located.

HPV and Cancer

Approximately 15 types of HPV are linked to cancer of the anus, cervix, vulva, vagina, and penis. They also can cause cancer of the head and neck. These types of HPV are known as “high-risk types.” Most cases of cervical cancer are caused by just two types of HPV—types 16 and 18.

Although certain types of HPV can cause cancer of the cervix, very few women infected with HPV develop this type of cancer. In most women, the *immune system* destroys the virus before it causes cancer. But in some women, HPV is not destroyed by the immune system and does not go away. In these cases, HPV can lead to cancer or, more commonly, precancer.

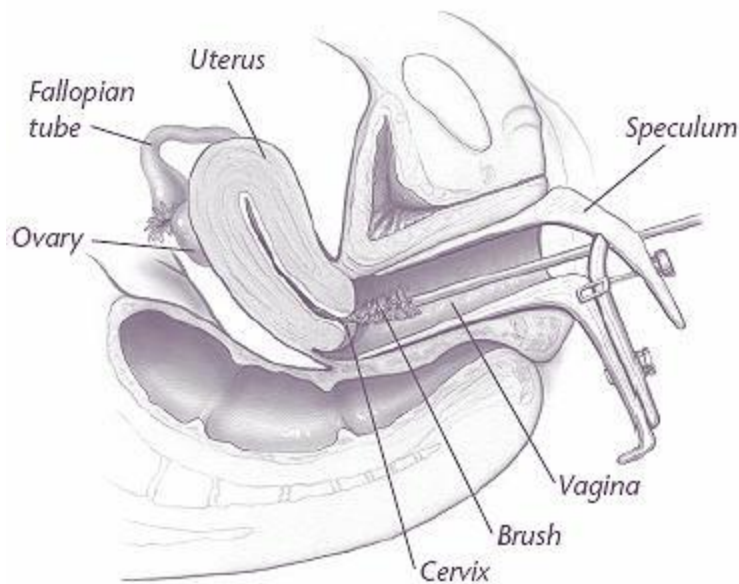
How HPV Infects the Cervix

The cervix is the opening of the uterus at the top of the vagina. It is covered by a thin layer of tissue made up of *cells*. If a high-risk type of HPV is present, it may enter these cells. Infected cells may become abnormal or damaged and begin to grow differently.

In some cases, the changes in these cells may progress to what is known as precancer. These changes in the thin tissue covering the cervix are called *dysplasia* or *cervical intraepithelial neoplasia (CIN)*. Dysplasia and CIN are graded as mild, moderate, or severe. Mild dysplasia (CIN 1) usually goes away on its own. Moderate (CIN 2) and severe (CIN 3) dysplasia indicate more serious changes. Both high-risk and low-risk types of HPV can cause the growth of abnormal cells, but only the high-risk types increase the chance that mild changes will progress to the more serious changes of cervical cancer.

HPV infections that are not destroyed by the immune system are described as “persistent.” If a woman is infected with a high-risk HPV type, and the virus is not killed by the immune system, it increases her risk of developing CIN. Young women will get rid of the virus quicker than older women. Also, whether a woman smokes affects her ability to get rid of the virus. The longer high-risk HPV persists and the older the woman, the greater the risk of CIN. When HPV is present, smoking doubles the risk of progression to CIN 3.

The Pap Test



For the Pap test, a speculum is placed into the vagina. A small sample of cells is removed with a small brush or swab. The sample then is sent to a lab to look for abnormal cells.

Screening Tests

It usually takes years for cervical cancer to develop. During this time, HPV infection can cause cells on or around the cervix to become abnormal. A **Pap test**, sometimes called cervical cytology screening, can detect early signs of abnormal cell changes of the cervix and allows early treatment so they do not become cancer. In this test, a sample of cells is taken from the cervix and sent to a lab. Regular use of the Pap test has greatly reduced the number of cases of cervical cancer in the United States.

An HPV test also is available. It is used along with the Pap test in women 30 years and older and as a follow-up test for women whose Pap tests show abnormal or uncertain results. The HPV test can identify at least 13 of the high-risk types of HPV. It can detect high-risk types of HPV even before there are visible changes to the cervical cells. Currently, there are no approved tests to detect HPV infection in men.

Testing Guidelines

Women should start having Pap tests at age 21 years. How often a Pap test is performed depends on a woman's age and health history:

- Women younger than 30 years should have a Pap test every 2 years.
- Women 30 years and older should have a Pap test every 2 years. After three normal Pap test results in a row, a woman in this age group may have Pap tests every 3 years if — she does not have a history of moderate or severe dysplasia

- she is not infected with *human immunodeficiency virus (HIV)*
- her immune system is not weakened (if she has had an organ transplant, for example)
- she was not exposed to diethylstilbestrol (DES) before birth
- Women older than 30 years may have an HPV test at the same time as a Pap test. If the results of both tests are normal, these women should not have another Pap test or HPV test for at least 3 years.
- Women aged 65 years or 70 years who are at low risk of getting HPV may be able to stop having Pap tests if they have had three or more normal test results in a row and no abnormal test results in the previous 10 years.

Abnormal Results

If a Pap test result is abnormal, follow-up testing is done. This testing can be simply a repeat Pap test in 6 months or 12 months, an HPV test, or a more detailed exam called a *colposcopy* (with or without a *biopsy*).

If results of follow-up tests indicate precancerous changes, treatment to remove the abnormal cells may be needed. There are several techniques that are used to remove abnormal cells. Whether treatment is needed depends on many factors:

- A woman's age
- The type of abnormal result (mild, moderate, or severe dysplasia)
- How long the abnormal cells have been present

HPV Vaccines

More than 30 types of HPV can infect the genital areas of a woman or a man:

- Most cases of cervical cancer are caused by types 16 and 18.
- Most cases of genital warts are caused by types 6 and 11.

Vaccines are available that can protect against these types of HPV. One vaccine protects against HPV types 16 and 18, which are the cause of most cases of cervical cancer. Another vaccine protects against types 16 and 18 as well as types 6 and 11, which are the cause of most cases of genital warts. These vaccines trigger a woman's immune system to fight off these viruses if she is exposed to them. They do not protect against other types of HPV.

Both vaccines are given in three doses over a 6-month period. Both are recommended for girls ages

11 years and 12 years, and for teens and women between ages 13 years and 26 years who did not get any or all of the three recommended doses when they were younger. The vaccines also can be given to girls beginning at age 9 years.

The vaccines are most effective if they are given before a woman is sexually active and is exposed to HPV. However, young women can receive the vaccine even if they have already had sex, have had genital warts, have received abnormal Pap tests results, or have been infected with HPV. If a woman is already infected with one type of HPV, the vaccines will not protect against disease caused by that type. However, the vaccines can protect women who have one type of HPV infection from the other types of HPV covered by the vaccines.

The vaccines are not a treatment for current HPV infection. They do not protect against all types of HPV and thus do not give complete protection against cervical cancer or genital warts. The vaccines are not recommended for pregnant women but are safe for women who are breastfeeding. Because these vaccines do not protect against all types of HPV, women who are vaccinated should still have regular Pap tests.

The most common side effect is soreness in the arm where the shot is given. On rare occasions, persons who received the shot experienced headache, fatigue, nausea, dizziness, fainting, or mild pain in the arm. These symptoms are mild and usually go away quickly.

younger, the HPV vaccine may help protect you from infection. Regular Pap tests and any follow-up tests that your health care provider recommends are the best ways to prevent cervical cancer.

Glossary

Biopsy: A minor surgical procedure to remove a small piece of tissue that is then examined with a microscope in a laboratory.

Cell: The smallest unit of a structure in the body; the building blocks for all parts of the body.

Prevention

There is no medical cure for HPV—it is best to take steps to prevent it. Young women can prevent certain types of HPV infection by being vaccinated (see [box](#)). You can decrease your risk of infection by avoiding contact with the virus. The following can help decrease your chance of infection:

- Limit your number of sexual partners. The more partners you have over the course of your life, the greater your risk of infection.
- Use condoms to reduce your risk of infection when you have vaginal, anal, or oral sex. Condoms also help protect against other STDs.

Condoms cannot fully protect you against HPV infection. HPV can be passed from person to person by touching infected areas not covered by a condom. These areas may include skin in the genital or anal areas. Female condoms cover more skin and may provide a little more protection than male condoms.

Finally...

Some types of HPV infections spread from person to person through sexual contact. To reduce your risk of infection, limit your number of sexual partners and use condoms. If you are 26 years or

Cervical Intraepithelial Neoplasia (CIN): Another term for dysplasia; a noncancerous condition that occurs when normal cells on the surface of the cervix are replaced by a layer of abnormal cells. CIN is graded as 1 (mild dysplasia), 2 (moderate dysplasia), or 3 (severe dysplasia or carcinoma in situ).

Cervix: The opening of the uterus at the top of the vagina.

Colposcopy: Viewing of the cervix, vulva, or vagina with magnification by using an instrument called a colposcope.

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

Human Immunodeficiency Virus (HIV): A virus that attacks certain cells of the body's immune system and causes acquired immunodeficiency syndrome (AIDS).

Immune System: The body's natural defense system against foreign substances and invading organisms, such as bacteria that cause disease.

Pap Test: A test in which cells are taken from the cervix and vagina and examined under a microscope.

Sexual Intercourse: The act of the penis of the male entering the vagina of the female (also called "having sex" or "making love").

Sexually Transmitted Disease: A disease that is spread by sexual contact, including chlamydia, gonorrhea, human papillomavirus infection, herpes, syphilis, and infection with human immunodeficiency virus (HIV, the cause of acquired immunodeficiency syndrome [AIDS]).

Vulva: The external female genital area.

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