Other Related Conditions

Human Papillomavirus (HPV)

What is HPV?

Human papillomavirus (HPV) is the most common viral sexually transmitted infection in the United States. There are more than 100 types of HPV, and a majority of sexually active people have had one or more at some point in their lives.

HPV lives in epithelial cells, the flat, thin cells on the surface of skin and mucous membranes. The virus may be present on the cervix, vagina, vulva, anus, penis, mouth or throat, and it is easily transmitted from one person to another via sexual contact.

In many cases, the immune system can naturally clear HPV infection. But people living with HIV (especially those with lower CD4 counts) and those with immunocompromising conditions are at higher risk for both HPV infection and disease progression.

What are the symptoms of HPV?

HPV can trigger abnormal cell growth. While most types of HPV do not cause symptoms—and many people don’t know they carry the virus—some can lead to serious problems.

Warts are typically small, raised lumps that can appear anywhere on the body. HPV types 6 and 11 cause genital or anal warts (condylomata acuminata), which may grow alone or in clumps in or around the vagina, penis or anus. The HPV types that cause genital warts are not linked to cancer. However, if you have one type of HPV, then you may also have others as well. This is especially true for people with HIV.

High-risk HPV types can cause abnormal cell changes, known as dysplasia, which has the potential to progress to cancer. In many cases, dysplasia resolves on its own, but this is less likely for people with HIV. Dysplasia may be graded as atypical squamous cells of undetermined significance (ASC-US), atypical glandular cells (AGC), low-grade or high-grade squamous intraepithelial lesions (LSIL or HSIL) or cervical or anal intraepithelial neoplasia (CIN or AIN).

Left untreated, dysplasia or neoplasia can progress to cervical, anal or oral (mouth and throat) carcinoma, as well as less common cancers of the vulva, vagina, penis and scrotum. HPV types 16 and 18 cause a majority of cervical and anal cancers. Other high-risk, or carcinogenic, types include 31, 33, 35, 39, 45, 51, 52, 56, 58 and 59.

People may not be aware they have dysplasia, but sometimes it can be painful or itchy. Cervical dysplasia, in particular, may be asymptomatic and go unnoticed. More advanced neoplasia and cancer can lead to symptoms such as pain, bleeding or a noticeable mass or lump.

Are people with HIV at risk for HPV?

People living with HIV are more likely to be infected with HPV than HIV-negative people, they are more likely to carry multiple HPV types, and they are less likely to naturally clear the virus. Men and women who have anal sex are at greater risk for anal HPV infection.

In addition, HIV-positive people are more prone to develop genital warts, cervical and anal dysplasia, and HPV-related cancers. Invasive cervical cancer is included in the definition of AIDS, but anal cancer is not.

Rates of HPV-related cancers among people with HIV have generally not declined since the advent of effective antiretroviral treatment in the mid-1990s. In fact, oral cancer rates have risen. In part, this is because people with HIV are living much longer with imperfectly preserved immune function, giving them more time to develop cancer.

Can HPV be prevented?

Most people acquire one or more types of HPV soon after they become sexually active. Using condoms can reduce HPV transmission somewhat, but they provide only limited protection because the virus can be transmitted via contact with skin and mucous membranes that are not covered.

The best way to protect yourself is to get the HPV vaccine. Earlier vaccines prevented infection with two or four HPV types, but the current Gardasil 9 vaccine protects against nine types (6, 11, 16, 18, 31, 33, 45, 52, 58). The vaccine is safe for people living with HIV.

The vaccine is recommended for adolescents—both girls and boys— ages 9 to 12, with catch-up vaccination through age 26. But the Food and Drug Administration has approved Gardasil 9 for people up to age 45. Although the vaccine is most effective before people become sexually active, older people may not have all the HPV types covered by the vaccine and could still benefit.

HPV vaccines have been used longer in girls and women, and they have been shown to prevent HPV infection, cervical dysplasia and cervical cancer. There is less data about the vaccine's effectiveness against anal and oral cancers, but many experts expect the level of protection to be similar.

How is HPV diagnosed?

Genital warts are usually diagnosed with a visual exam. Abnormal cell growth, or dysplasia, is diagnosed with a cervical or anal Pap test. This involves removing a sample of cells and examining them under a microscope for abnormalities. An HPV DNA test may also be done to detect cancer-causing types. These two tests are often done together.

If a Pap test shows dysplasia, the next step is colposcopy or anoscopy, in which a doctor examines the cervix or anus using a lighted magnifying instrument. The doctor may also do a digital rectal exam to check for lumps or abnormal tissue.

Women, trans men and other people with a cervix should have their first cervical Pap smear and HPV test within a year after becoming sexually active, or by age 21 at the latest. If the Pap test is normal, those ages 21 to 29 should be screened again every three years. Those ages 30 to 65 may receive HPV tests alone or HPV tests and Pap smears every three to five years. People over 65 may not need further screening if they have had multiple negative HPV tests or normal Pap smears in the past 10 years.

Women living with HIV and others at higher risk for developing cervical cancer should undergo cervical screening more often. HIV treatment guidelines recommend that women with HIV should get a Pap test at the time of HIV diagnosis. If it is normal, the next test should be done a year later. After three consecutive normal tests, screening can be done every three years. Cervical screening should continue throughout life and not stop at age 65.

Anal HPV tests and Pap smears are not routinely done, although some clinicians who treat many gay men or HIV-positive people may offer them. The ANCHOR study showed that screening for abnormal anal cell changes and treating them early can reduce the risk of progression to anal cancer in people living with HIV. Women with cervical dysplasia should also be tested for anal dysplasia.

How is HPV treated?

There is currently no specific antiviral therapy to clear HPV infection. The HPV vaccine does not treat existing infection, and ideally, vaccination should be done before infection occurs.

A variety of treatments are available to remove or destroy abnormal cells, including warts and cervical or anal dysplasia or neoplasia.

Topical treatments are liquids, gels or creams containing medications such as fluorouracil, imiquimod or trichloroacetic acid. They are applied directly to warts or abnormal cervical or anal lesions.

Cryotherapy uses liquid nitrogen to freeze warts or low-grade dysplasia. This is one of the easiest treatments and can often be performed in a doctor’s office.

Electrocautery uses electricity to burn off abnormal lesions.

Infrared coagulation is a non-surgical procedure that delivers short bursts of infrared light to destroy abnormal tissue.

Laser treatment uses a high-powered light beam to burn off abnormal tissue.

LEEP (loop electrical excision procedure) uses a wire loop heated by an electrical current to

remove abnormal tissue.

Cone biopsy is a surgical procedure that removes a cone-shaped portion of the cervix.

The effectiveness and side effects of these treatments can vary widely. Some methods cause more discomfort than others, some require multiple administrations and some require more recovery time. Depending on the treatment, side effects may include pain, burning, itching and bleeding. A single course of treatment may not be enough to prevent disease progression, especially of more advanced neoplasia, so those who undergo treatment should continue to be monitored closely. People with HIV may need more frequent or more aggressive treatment than their HIV-negative peers.

Cancer Treatment

Once dysplasia or neoplasia has progressed to carcinoma, more aggressive treatment is needed. For cervical cancer, this may include surgery to remove the cervix, which means women who later get pregnant will need to have a Cesarean section instead of a vaginal birth. Extensive surgery for anal or oral cancer is more disabling.

Depending on how advanced the cancer is, treatment options may include radiation therapy, chemotherapy, targeted therapy medications or immunotherapy. Click here for more information about cervical cancer and anal cancer.

Are there any experimental treatments?

To find out if you are eligible for clinical trials of new therapies for HPV-related conditions, visit ClinicalTrials.gov, a site run by the U.S. National Institutes of Health.

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