Sexually Transmitted Infections

Human papilloma virus (HPV)

Human papillomavirus is the most common sexual infection in the United States, with 79 million people having the infection. Nearly half of all sexually active people have had HPV at some point in their lives. Since it often doesn't cause symptoms, many never know they've had it.

Though most types of HPV do not cause serious disease, some can lead to cancer. Left untreated, these high-risk types can cause cervical and anal cancers and less common cancers of the vulva, penis, scrotum, mouth and throat. HPV has become a growing concern for people with HIV since they're at higher risk for both HPV infection and disease, especially at lower CD4 counts.

What is HPV?

HPV is a virus that lives in the flat, thin cells on the surface of your skin, called epithelial cells. These are also found on the surface of the vagina/front hole, vulva, cervix, anus, penis head, mouth and throat, which is why having sex can easily pass the virus onto others—including surfaces of skin that you can see, like that of the vulva, and on what you can't see, such as the surface of the cervix or inside the anus. Most people who get HPV clear the infection on their own, often within 6 months to a year.

More than 100 types of HPV exist. Some do not appear to cause health problems at all while others cause the common and plantar warts. About 40 types are responsible for genital warts, while about a dozen high-risk types can cause dysplasia, which are abnormal cells that can lead to cancer.

HPV types 6 and 11 cause about 90% of genital warts. Types 16 and 18 cause about 65% of cervical and anal cancers. Other high-risk types include 31, 33, 35, 39, 45, 51, 52, 56, 58 and 59, some of which cause anal disease. (See below for information on HPV prevention.)

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, which could be the ones that cause cancer. This is especially true for people with HIV.

Can HPV be prevented?

There are three approaches to preventing HPV: using condoms during sex to prevent transmission, getting vaccinated from ages 9 to 26 to prevent infection, and getting screened regularly to prevent existing disease from becoming more serious (as described below).

Using condoms regularly and properly during sex greatly reduces the transmission of HPV by up to 70%. Using condoms only half the time reduces the risk by 50%. Condoms also reduce the risk of dysplasia and cancer, at least in women who reported consistent condom use in studies.

HPV can also be prevented by using one (or more) of three vaccines: Cervarix (types 16, 18), Gardasil (types 6, 11, 16, 18), and Gardasil 9 (types 6, 11, 16, 18, 31, 33, 45, 52, 58), although Gardasil 9 is now recommended over Gardasil. These vaccines are approved by the FDA for females and males aged 9 to 26, preferably before sexual activity has started. These vaccines are safe to use in people living with HIV, although how effective they are has not been established through clinical study.

Benefits from using these vaccines in those older than 26 years of age are currently being studied. Therapeutic vaccines are also being studied to help treat existing disease, to reduce the need for aggressive treatments, and to reduce the risk of recurring dysplasia. One such vaccine, called HspE7, is safe and possibly effective in HIV-positive men and women with anal dysplasia.

Cancers of the mouth and throat can be due to HPV infections or other reasons, and people living with HIV have higher rates of these cancers. However, it is unknown if any of the vaccines reduces the rates of HPV-related oral cancers. HPV DNA testing may help identify risk but no tests are available to detect where oral cancer may appear, which makes screening difficult. For those people living with HIV who have or have had other HPV disease, it may be wise to more closely watch for possible symptoms of oral cancers.

What are the symptoms of HPV?

- Warts: Small, raised, hard lumps with a surface like cauliflower may grow alone or in clumps in or around the vagina/front hole, anus, or the tip of the penis. They are sometimes called condylomata acuminata or condylomas. The presence of warts may mean that dysplasia is also present and should be looked for.
- Dysplasia: Symptoms can’t be felt or easily seen, so it’s important to get regular Pap smears to find dysplasia of the cervix or anus. It’s often referred to as a “pre-cancer” form of disease. Most dysplasia goes away on its own; however, if it’s found then it should be checked regularly to see if it progresses to cancer.
- Cancer (carcinoma): Dysplasia can develop into cancer. The four most common types are cervical, anal, rectal and penile cancers. HPV can also cause head and neck cancers of the mouth or throat. Symptoms may not be present, and if they are they can include bleeding, pain, odor or a noticeable mass. If not diagnosed and treated early, these can become life-

threatening.

People living with HIV are more likely to be infected with HPV than HIV-negative people, and are also more likely to develop genital warts, cervical and anal cancer, and head and neck cancer. Although the rates of some cancers have gone down since the start of combination treatments in 1996, anal and head/neck cancer rates have gone up while cervical cancer rates have stayed about the same. This is due, in part, to people living much longer but with imperfectly preserved immune systems.

How is HPV diagnosed?

Genital warts are diagnosed by a visual exam by your doctor. Dysplasia is diagnosed through a cervical or anal Pap test done by your doctor. Here, a small piece of tissue is removed and screened for abnormal cells. An HPV DNA test may also be done, which can detect up to 14 cancer-causing types. If it hasn't been done and the Pap results show dysplasia, your doctor may run the DNA test to see what types are present.

To further examine the cervix, your doctor may use a colposcope—a special microscope that looks at the cells of the cervix, vagina/front hole and vulva. To examine the anus, you may have a digital rectal examination done, which is when your doctor inserts a finger into the anus to check for bumps or abnormal tissue. An anoscopy may also be done, which is when your doctor uses a special microscope to examine the anus more closely.

Cervical Dysplasia and Cancer

To check for these conditions, a health provider can perform a cervical Pap smear and perhaps an HPV DNA test. Pap smears are generally done less often when results do not show dysplasia over time, while they're done more often when dysplasia has been found.

Women should have their first cervical Pap smear within a year of becoming sexually active or no later than 21 years. Women with HIV should have a cervical Pap smear done at diagnosis and periodically thereafter. Men and women who practice anal sex should also have regular anal Pap smears (although anal dysplasia can occur in women and men who report they do not engage in receptive anal sex). Women living with HIV who are 65 years and older should continue to get Pap smears and HPV DNA tests done.

An abnormal Pap smear result means that a closer examination should be done. A procedure called a colposcopy—that uses a microscope to look closely at the vagina/front hole and cervix during a pelvic exam—is used to look for patches of abnormal cells, or lesions, on or around the cervix. These lesions are referred to as cervical intraepithelial neoplasia (CIN). If lesions are found, a biopsy can be performed to learn how serious the condition is.

The biopsy will be scored from low-grade (CIN 1) to moderate- and high-grade (CIN 2, 3) according to the thickness of the abnormal cells. CIN 1 is usually not treated but is monitored closely (because it often resolves on its own), while CIN 2 or 3 are more likely to develop into cancer and

often need to be treated to prevent cancer.

Anal Dysplasia and Cancer

Despite increasing rates of anal dysplasia (AIN, anal intraepithelial neoplasia) and cancer, the best method of detecting these conditions has not been determined. Some health providers recommend routine anal Pap smears and anoscopy, which is similar to cervical Pap smears.

Other health providers prefer to refer patients for much more sensitive testing done by a specialist. Either way, HPV experts recommend routine anal dysplasia testing for all HIV-positive men who have sex with men and women with a history of cervical dysplasia. Studies are also being done to clarify which methods are best for monitoring and treating anal dysplasia, much like what is already in place for cervical dysplasia. The scoring system for AIN is similar to the one used for CIN, discussed above.

How is HPV treated?

Treatments are available that remove or destroy irregular cells, like those in genital warts or dysplasia or cancer lesions. Other treatments are still being studied to cure the underlying HPV infection. The type of treatment (and whether it's used at all) depends upon the severity of the HPV disease.

Two out of five people will clear warts on their own. You or your doctor may treat genital warts. Treatment for dysplasia or cancer lesions must be done by a clinician. Some treatments cause more discomfort than others, and some need recovery time. People with HIV sometimes need more aggressive treatment. Depending on the treatment, side effects can include discomfort, irritation, pain, burning, and bleeding.

Topical medications: Topical gels and creams—such as fluorouracil, imiquimod, podofilox, podophyllin solution, and trichloroacetic acid—are used for treating genital warts on the skin or inside the anus or vagina/front hole (except imiquimod). They are 30–80% effective in reducing wart size.

Cryotherapy uses liquid nitrogen to freeze warts or other abnormal cells inside or near the genitals to treat genital warts and low-grade dysplasia. This is one of the easiest treatments and can often be performed in a doctor's office. It is 60–90% effective.

Laser treatment is more aggressive than cryotherapy. It uses a high-powered light beam to burn and remove abnormal anal or cervical tissue, and is usually done in a hospital. Laser treatment is 20–50% effective for moderate and high grade dysplasia, provided that the entire lesion can be seen using either a colposcope or anoscope.

LEEP (loop electrical excision procedure) is a type of surgery, and is almost always performed in a hospital. Like laser treatment, LEEP should not be used on lesions that are too deep to see with a colposcope or anoscope.

Cone biopsy cuts away abnormal cervical or anal tissue to diagnose and treat dysplasia.

Radical surgery/radiation/chemotherapy: Cervical and anal cancer (carcinoma) are treated like other forms of cancer. Radiation and/or surgery are often necessary to either destroy or remove the cancer and the surrounding tissue. If the cancer spreads, chemotherapy is often used to kill cancer cells in other parts of the body.

Other treatments are also available, including electrocautery and infrared coagulation. A single treatment of moderate- or high-grade dysplasia may or may not be enough to prevent progressing disease. Therefore, people who have had CIN or AIN stage II or III dysplasia should continue to be monitored closely.

Are there any experimental treatments?

Yes. If you would like to find out if you are eligible for any clinical trials that include new therapies for the treatment or prevention of these HPV-related problems, visit ClinicalTrials.gov, a site run by the U.S. National Institutes of Health. The site has information about all HIV-related clinical studies in the United States. For more info, you can call their toll-free number at 1-800-HIV-0440 (1-800-448-0440) or email contactus@aidsinfo.nih.gov.

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