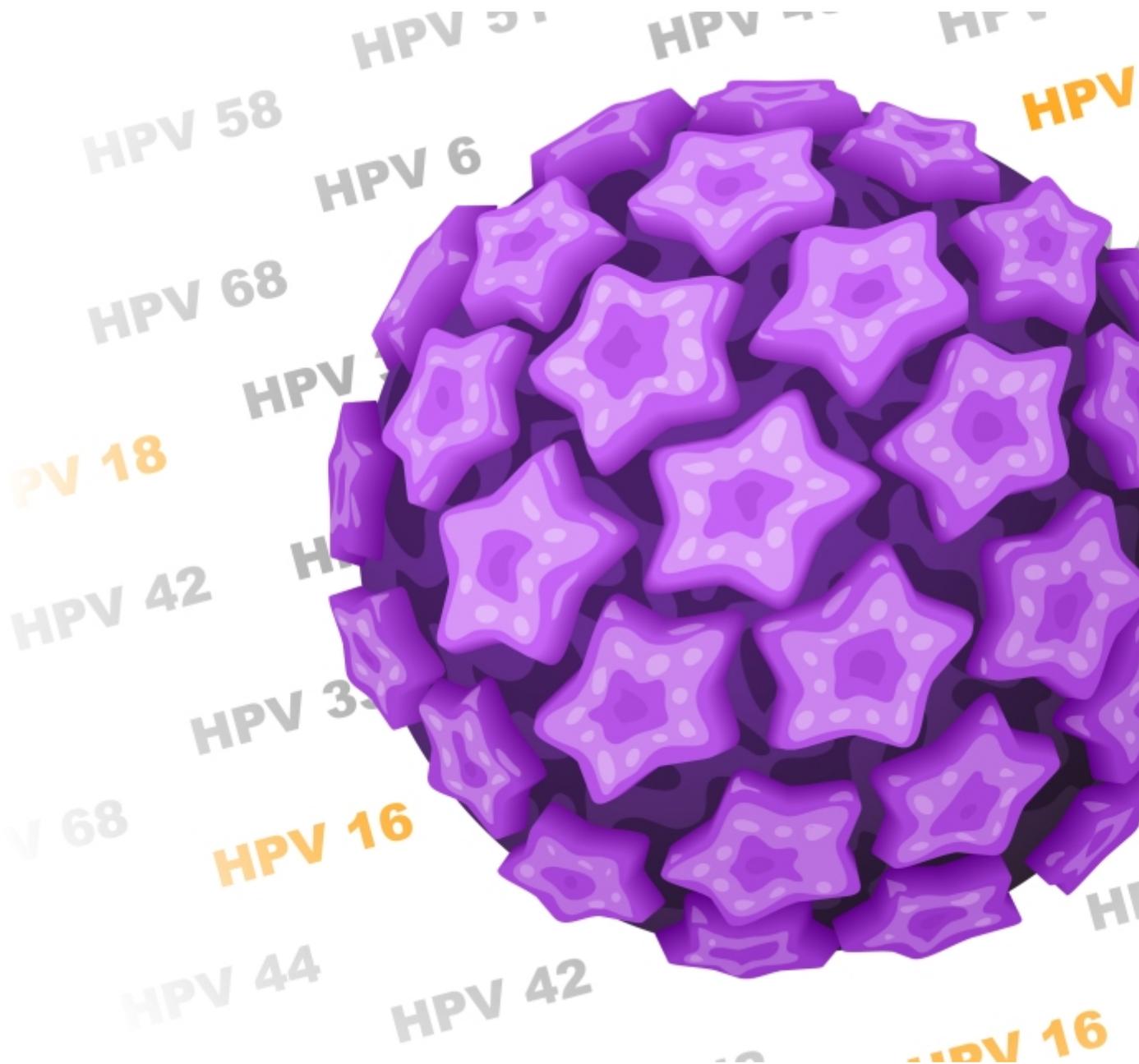


# Human Papillomavirus (HPV) <sup>[1]</sup>

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## What Is HPV?

Human papillomavirus (HPV) is the name of a large group of viruses. Certain types of HPV can cause warts on the hands, feet, mouth, or throat. About 30 to 40 types can cause infections in the genital area (the vulva, vagina, penis, buttocks, scrotum, and anus).

Genital HPV is a very common sexually transmitted infection or disease (STI or STD) [2] worldwide. The World Health Organization (WHO) estimates that more than 290 million women were infected with HPV in 2013. HPV infection is responsible for more than half a million cases of cervical cancer each year, over 85 percent of which occur in the developing world.

Genital HPV types are often grouped as "low risk" or "high risk." Low-risk types can cause genital warts. High-risk types can cause cervical cancer [3] or cancer of the vulva, vagina, anus, and penis. The types of HPV that can cause genital warts are not the same as the types that can cause cancer. However, if you have warts, you may have also been exposed to the types of HPV that can cause cancer.

Genital HPV is spread easily through skin-to-skin contact during vaginal or anal sex with someone who has the infection. Insertive or penetrative sex is not required for HPV to be spread between sexual partners. Condoms and other latex barriers do not totally prevent transmission. Most people with HPV do not know they have it because they do not develop symptoms, yet they can still pass it on to someone else.

Although most sexually active women and men will be infected with HPV at some time, nine times out of ten, the body's immune system clears HPV infection naturally (gets rid of the infection without treatment) within two years. Because HIV weakens the immune system [4], people living with HIV (HIV+ people) are more likely to be infected with HPV than HIV-negative people. One study found HPV in more than three out of four women living with HIV. Women living with HIV who have HPV are also more likely to have:

- Difficulty clearing the infection naturally
- HPV infections that were once under control and come back again
- HPV that responds poorly to standard treatment; multiple therapies using different methods may be needed
- Several types or strains of HPV at once
- Infection with the "high risk" HPV types that can cause cancer
- Higher risk of developing cervical and anal cancer when infected with the "high risk" types

If you have sex, it is important to be checked regularly by your health care provider for signs of HPV such as genital warts, cervical cancer, and anal cancer. For information on vaccines and routine screenings for HPV, see the section on Prevention of HPV below.

## Genital Warts

Certain types of HPV can cause warts on the vulva (including the labia, or 'lips'), in or around the vagina or anus, or on the penis, scrotum, groin, or thigh. Warts can appear anywhere from a few weeks to a few months after you are exposed to HPV. They can even appear years after exposure.

### Symptoms:

- Flesh-colored, pinkish, or white warts that appear as small bumps or groups of bumps. They can be raised or flat, different sizes, and are sometimes shaped like cauliflower.

### Diagnosis:

- Health care providers can usually identify genital warts by looking at them
- Sometimes a biopsy is done (a sample of the suspected wart is cut off and examined under a microscope)
- Some health care providers may use a vinegar solution to help identify flat warts with the naked eye; however, this test may sometimes wrongly identify normal skin as a wart

### Treatment:

There is no cure for HPV, but genital warts can be treated by removing the wart if they do not go away on their own.

- The following treatments must be done in a health care provider's office:
  - TCA (trichloroacetic acid): A chemical is applied to the surface of the wart
  - Cryotherapy: Freezing off the wart with liquid nitrogen
  - Electrocautery: Burning off the wart with an electrical current
  - Laser therapy: Using an intense light to destroy the wart
  - Excision: Cutting out the wart
- Some treatments can be done at home with prescription creams: Aldara or Beselna (imiquimod), Condylox (podofilox or podophyllotoxin), and Veregen (sinecatechins, or green tea extracts). Because Aldara and Beselna act on the immune system, it is important to talk with your health care provider about the best prescription wart treatment for you if you are living with HIV.
- Do not use over-the-counter wart removal products to treat genital warts
- Some wart treatments should not be used by pregnant [5] women or women who are breastfeeding
- Warts can reappear after successful treatment

If left untreated, genital warts may go away, remain unchanged, or increase in size or number. Some people decide not to have treatment right away to see if the warts will go away on their own. When considering treatment options, you and your health care provider may take into account the size, location and number of warts, changes in the warts, your preference, and

the side effects of treatment.

Many women living with HIV, especially those with low CD4 cell counts [6], may not be able to get rid of genital warts using standard treatments. Several different treatments may be needed. For women living with HIV, one of the best ways to strengthen the immune system and help get rid of genital warts is to take HIV drugs. If you are already taking HIV drugs, it is important that you take them exactly as directed so that they can increase your CD4 count and fight off HPV.

For pictures of different sexually transmitted infections, including genital warts caused by HPV, please click [here](#) [7] (note: some of these images are graphic).

## **Cervical Dysplasia and Cervical Cancer**

Certain types of HPV can cause abnormal cells to form. This is called dysplasia. The main place dysplasia occurs is on the cervix (entrance to the womb). Other less common areas are the vagina, vulva, and anus. Dysplasia is not cancer, but if left untreated, it can develop into cancer. For this reason, cells with dysplasia are sometimes referred to as pre-cancerous cells.

Screening for dysplasia and cervical cancer is essential to find and treat early pre-cancerous changes and to prevent cervical cancer. Traditionally, the Papanicolaou test (Pap test or Pap smear) has been done. This test uses a small brush to collect a few cells to check for changes in the cervix. Now, liquid based systems to screen samples of cervical cells are much more common and are effective for finding abnormal cells.

Because Pap tests require laboratories and people skilled in reading them, resource-limited countries offer different tests to screen for dysplasia and cervical cancer. One method is called visual inspection with acetic acid, or VIA. When using VIA, health care providers swab acetic acid (also known as vinegar) on the cervix and look directly at it to see if any areas need treatment. Other countries use HPV tests, which test samples taken from your cervix for the presence of HPV's DNA (its genetic material).

Cervical cancer usually takes years to develop, but it does not have symptoms until it is quite advanced. This is why getting screened on a regular basis is important; screening can catch potential problems before they get worse. It is especially important for women living with HIV to have regular cervical screening tests every year. This is because women living with HIV are more likely to have abnormal cervical screening tests than HIV-negative women.

Cervical cancer can be life threatening. It is one of the few AIDS-defining conditions [8] specific to women. Fortunately, it can be prevented through early diagnosis and treatment.

### **Symptoms:**

- Many women do not experience symptoms
- In very advanced stages, a woman may experience abdominal pain, vaginal discharge, bleeding after having vaginal sex, and bleeding between periods

### **Screening and diagnosis:**

In the US:

- Women living with HIV should have a complete gynecological examination [9], including a cervical screening test and a pelvic exam, when they are first diagnosed, and then another test six months later
- If both tests are normal, a repeat cervical screening test should be done every year
- Women living with HIV who have had dysplasia in the past should receive a cervical screening test every six months
- Pregnant women living with HIV should have a cervical cancer screening test when they first seek prenatal care
- Women who were born with HIV (perinatally infected) are more at risk of having high-risk types of HPV; therefore, cervical screening should start prior to age 21 if they are sexually active
- An abnormal cervical screening test can indicate inflammation, infection, dysplasia, or cancer
- If you have an abnormal cervical screening test, you will need a colposcopy (an exam of your cervix using a magnifier to look at the tissue more closely) and a biopsy (a small amount of tissue is removed so it can be checked under a microscope for signs of cancer)
- An HPV test can be used along with the cervical screening test to look for high-risk types that may lead to cancerous and pre-cancerous conditions. Speak with your health care provider to see if your cervical screening test includes an HPV test.

From the World Health Organization (WHO):

- Women living with HIV should be screened for cervical cancer, regardless of age
- Women living with HIV should be screened for cervical cancer regularly (e.g., once a year)
- If you have a VIA or HPV test that shows an abnormality, you may need treatment (see below); which screening tests and treatments are available will depend on where you live

Many countries have screening and diagnosis guidelines that differ from the WHO and US guidelines listed above. Please check with your country or region to see what the standard of care is in your area.

### **Treatment for cervical dysplasia:**

If you have dysplasia, discuss treatment choices with your health care provider. Most treatments focus on destroying the abnormal cells so that they do not become cancer.

- Laser therapy: Using an intense light to destroy the cells
- Cold-knife cone biopsy (conization): Cutting the cells out (an operation)
- LEEP: Loop electrosurgical excision procedure, which uses a thin electrified wire loop to cut out the cells
- Cryotherapy: Freezing the cells with liquid nitrogen
- In cases of mild dysplasia, your health care provider may just monitor the cervix by colposcopy, repeat cervical screening tests, and/or an HPV test

Cervical dysplasia is more common in women living with HIV who have advanced HIV disease and low CD4 cell counts. Cervical dysplasia is often more serious and difficult to treat in women living with HIV than HIV-negative women.

## Treatment of cervical cancer:

Cervical cancer is most treatable when it is diagnosed and treated early, so regular cervical screening tests are extremely important. Treatment depends on the type of cervical cancer and how far it has spread. Often, more than one kind of treatment is used. Treatments include:

- Surgery: Cancer tissue is cut out in an operation
- Chemotherapy: Drugs (pills and/or intravenous medications) are used to shrink or kill the cancer
- Radiation: High-energy rays (similar to X-rays) are used to kill the cancer cells

For more information, see our article on [Cancers](#) [3].

## Anal Dysplasia and Anal Cancer

Certain types or strains of HPV may cause dysplasia and cancer in the anus. Although the risk of developing dysplasia is higher among men who have sex with men, women are also at risk, especially those living with HIV or who have had receptive anal sex with a man.

### Symptoms:

- Many women do not experience symptoms
- Anal or rectal bleeding, irritation, itching, or burning
- In very advanced stages, there may be abscesses, lumps, ulcers, and anal discharge

### Screening and diagnosis:

- Careful physical examination by a health care provider may be the best way to find anal cancers
- An abnormal anal Pap test may be a sign of dysplasia or cancer
- Your provider may also perform a digital rectal exam (DRE), in which she/he slides a lubricated, gloved finger through your anus and into your rectum to feel for abnormal masses
- If you have symptoms, you may need an anoscopy (an exam of the anus using a magnifier to look at the tissue more closely) and a biopsy (tissues are removed so they can be checked under a microscope for signs of cancer)
- It is important to ask your health care provider to check for anal cancer on a regular basis

### Treatment for anal dysplasia:

If you have dysplasia, discuss treatment choices with your health care provider. Most treatments focus on destroying the abnormal cells so that they do not become cancer.

- Infrared coagulation: Using infrared light to cut off the blood supply to the cells and thereby kill them
- Electrocautery: Burning off the cells with an electrical current
- Laser therapy: Using an intense light to destroy the cells
- Surgery: Using a surgical knife to cut out the cells
- Cryotherapy: Freezing the cells with liquid nitrogen

Anal dysplasia is more common in women living with HIV than HIV-negative women, especially women with advanced HIV disease and low CD4 cell counts. Anal dysplasia is often more serious and difficult to treat in women living with HIV than HIV-negative women. For women living with HIV, taking HIV drugs can strengthen the immune system and help anal dysplasia become less severe. If you are already taking HIV drugs, it is important that you take them exactly as directed so that they can increase your CD4 count and fight the HPV that can cause anal cancer.

### **Treatment of anal cancer:**

Anal cancer is most treatable when it is diagnosed and treated early, so regular exams are extremely important. Treatment depends on the type of anal cancer and how far it has spread. Often, more than one kind of treatment is used. Treatments include:

- Surgery: Cancer tissue is cut out in an operation
- Chemotherapy: Drugs (pills and/or intravenous medications) are used to shrink or kill the cancer
- Radiation: High-energy rays (similar to X-rays) are used to kill the cancer cells

For more information, see our fact sheet on [Cancers](#) [3].

## **Prevention of HPV**

### **Vaccines**

There are currently three HPV vaccines: Gardasil (made by Merck; also known as Silgard), Gardasil-9 (also made by Merck), and Cervarix (made by GlaxoSmithKline). All three have been approved by the US Food and Drug Administration (FDA), Health Canada, and the European Medicines Agency (EMA). Gardasil-9 is still awaiting approval in the UK. There are now demonstration projects that are bringing HPV vaccines to girls and women in low-income countries as well.

In the US, Gardasil products have been approved for females and males ages 9 to 26, while Cervarix has been approved for females ages 10 to 25. Gardasil -9 will soon be the only HPV vaccine available in the US.

The vaccines protect against types of HPV that cause the majority of cervical cancers and genital warts. Recent studies have shown that these vaccines can also provide protection against HPV-related vaginal cancers, vulvar cancers, and anal cancer in women. The vaccines do not protect against less common HPV types. Therefore, health care providers still recommend regular cancer screening tests to look for signs of cancer.

It is best if young people get all doses of the vaccine before their first sexual contact. This helps them develop an immune response before they are exposed to HPV. People who are infected with some types of HPV may still benefit from the vaccine's effects against other types of HPV. The US Centers for Disease Control and Prevention (CDC) recommends HPV vaccines for both females and males. The HPV vaccine is routinely given at ages 11 or 12; however, it is approved for use from ages nine through 26.

In Canada, the National Advisory Committee on Immunization (NACI) recommends Gardasil

vaccination for females ages nine through 45 and males ages nine through 26, or vaccination with Cervarix for girls and young women ages nine through 45. In the UK, vaccination with Gardasil is offered to girls ages 12 and 13 through the National Health Service.

Pregnant women <sup>[5]</sup> should not receive the vaccine. However, it is safe to get the vaccine while breastfeeding. Speak to your health care provider about the HPV vaccine to see if it is right for you. In the US, there are payment assistance programs for people who cannot afford the HPV vaccines; see the resource section of this article for contact information.

Based on recent study data showing that HPV vaccines are very good at getting the body to produce a strong immune response, there is a move toward reducing the number of doses from three to two. Girls and boys ages nine to 13 have a stronger response to the vaccine than older adolescents. Therefore, the European Medicines Agency recently approved that Cervarix be offered as a two-dose vaccination for nine to 14-year-old girls and boys and that Gardasil be offered as two-dose vaccination for nine to 13-year-old girls and boys. In October 2016, the CDC recommended that girls and boys under 15 years of age receive two doses of HPV vaccine, while those 15 to 26 years continue to receive three doses of HPV vaccine.

To reduce the total number of injections, future HPV vaccine development includes the possibility of adding HPV vaccine to another existing vaccine (e.g., combining it with measles in one shot).

## **Routine Screenings**

Regular pelvic and anal exams and cervical screening tests <sup>[9]</sup> are very important. While they cannot prevent HPV-related problems, they can help catch warts and dysplasia (abnormal or pre-cancerous cells) before they get worse and cause greater problems.

Studies have shown that, although women living with HIV are at an increased risk for cervical cancer, nearly one in four women living with HIV in the US did not get their recommended yearly cervical screening tests (note: two cervical cancer screenings are recommended in the first year after a woman is first diagnosed with HIV). It is very important that women living with HIV get yearly routine cervical screening testing and follow up as needed to identify problems before cancer develops. Follow up involves seeing a gynecologist so that the cells of the cervix can be looked at closely with a microscope to look for abnormal cells that might be pre-cancerous. Prevention is always better ? healthier, less painful, and less costly ? than treatment.

## **Condoms**

Even though condoms do not fully protect against HPV, when used correctly they can help reduce the chances that HPV will be spread.

## **Not Smoking**

Smoking has been shown to increase the chance of developing several types of cancer including cervical and anal cancers. If you smoke, it is a good idea to try and quit. Talk with your health care provider about stopping smoking <sup>[10]</sup> ? there are many tools to help you quit. You can also find lots of information and support online (<http://www.smokefree.gov> <sup>[11]</sup>).

# Taking Care of Yourself

HPV can be very serious for people living with HIV. Since there are frequently no symptoms, getting regular exams from your health care provider is the best way to be sure that any problems are found and treated early.

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## Additional Resources

Select the links below for additional material related to HPV.

[Find a Screening Provider Near You; or call 1800-CDC-INFO \(CDC\)](#) [23]

[Human Papillomavirus \(CDC\)](#) [24]

[Gardasil Patient Assistance Programs \(Merck\)](#) [25]

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[HPV Vaccine Introduction Clearing House \(WHO\)](#) [31]

[CDC's "HPV Vaccines: Q & A"](#) [32]

[HPV and Cervical Cancer in HIV-Positive Women \(The Body\)](#) [33]

[HPV vaccine may benefit HIV-infected women \(NIH\)](#) [34]

[GSK Vaccines Assistance Program \(for Cervarix; 1-877-822-1555\)](#) [35]

[Gardasil 9 Vaccine Protects Against Additional HPV Types \(NCI\)](#) [36]

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- [35] <http://www.gsk-vap.com/>
- [36] <https://www.cancer.gov/types/cervical/research/gardasil9-prevents-more-HPV-types>

- [37] <http://www.gavi.org/support/nvs/human-papillomavirus-vaccine-support/>
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