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## HPV (Human Papillomavirus)

Learn about the human papillomavirus (HPV) and its link to cervical cancer and many types of other cancer. You can also get information on testing for HPV and on the HPV vaccines.

[What Is HPV \(Human Papillomavirus\)?](#)

[Types of HPV](#)

[Cancers Linked with HPV](#)

[HPV Signs and Symptoms](#)

[How to Protect Against HPV](#)

[HPV Testing](#)

[HPV Vaccines](#)

### Related Topics

[The American Cancer Society Guidelines for the Prevention and Early Detection of Cervical Cancer](#)

The American Cancer Society recommends that women follow these guidelines to help find cervical cancer early.

[The HPV Test](#)

The most important risk factor for developing cervical cancer is infection with HPV. Doctors can test for the high-risk HPV types that are most likely to cause cervical cancer by looking for pieces of their DNA in cervical cells. [Learn More.](#)

[Infections that Can Lead to Cancer](#)

Get an overview of how infections with some viruses, bacteria, and other germs may increase a person's risk for certain types of cancer.

### More Resources

[Prevent Cancer with the HPV Vaccine](#)





or around the mouth and on genitals.

## What is the treatment for HPV?

There is no treatment for the HPV infection itself. But there are treatments for the warts, cell changes, pre-cancers, and cancers that HPV can cause.

**Treating genital warts:** If HPV causes visible genital warts, they can be treated by a health care provider. Treatment options include surgery, laser therapy, or cryotherapy (freezing the warts) in a clinic or office. A lotion or cream may also be prescribed to be used at home. Many times genital warts come back after being treated, but they can be treated again.

**Finding and treating cell changes and pre-cancers:** Having regular cervical cancer screening tests can find early cell changes and pre-cancers in the cervix that are caused by HPV. If needed, the cell changes and pre-cancers can be treated by removing or freezing them before they become cancer.

While there aren't screening guidelines for other HPV-related cancers, dentists may check for oral (mouth) cancers, and doctors might recommend that high-risk men and women get anal HPV testing.

**Treating HPV-related cancers:** Cancers caused by HPV have different treatment options depending on the type and stage of the cancer. Cancers caused by HPV are typically easier to treat when they are found early, are small, and have not yet spread. See our [list of cancer types](#)<sup>2</sup> for information on how each type of cancer is treated.

## Hyperlinks

1. [www.cancer.org/cancer/risk-prevention/hpv/hpv-and-cancer-info.html](http://www.cancer.org/cancer/risk-prevention/hpv/hpv-and-cancer-info.html)
2. [www.cancer.org/cancer/types.html](http://www.cancer.org/cancer/types.html)

## References

American Cancer Society. Cancer Prevention & Early Detection Facts & Figures 2023-2024. American Cancer Society, Atlanta, GA. 2023.

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Palefsky JM. Human papillomavirus infections: Epidemiology and disease associations. UpToDate. 2023. Accessed at <https://www.uptodate.com/contents/human-papillomavirus-infections-epidemiology-and-disease-associations> on February 13, 2024.

Saslow D, Andrews KS, Manassaram-Baptiste D, et al. Human papillomavirus vaccination 2020 guideline update: American Cancer Society guideline adaptation. CA Cancer J Clin. 2020; DOI: 10.3322/caac.21616.

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## Types of HPV

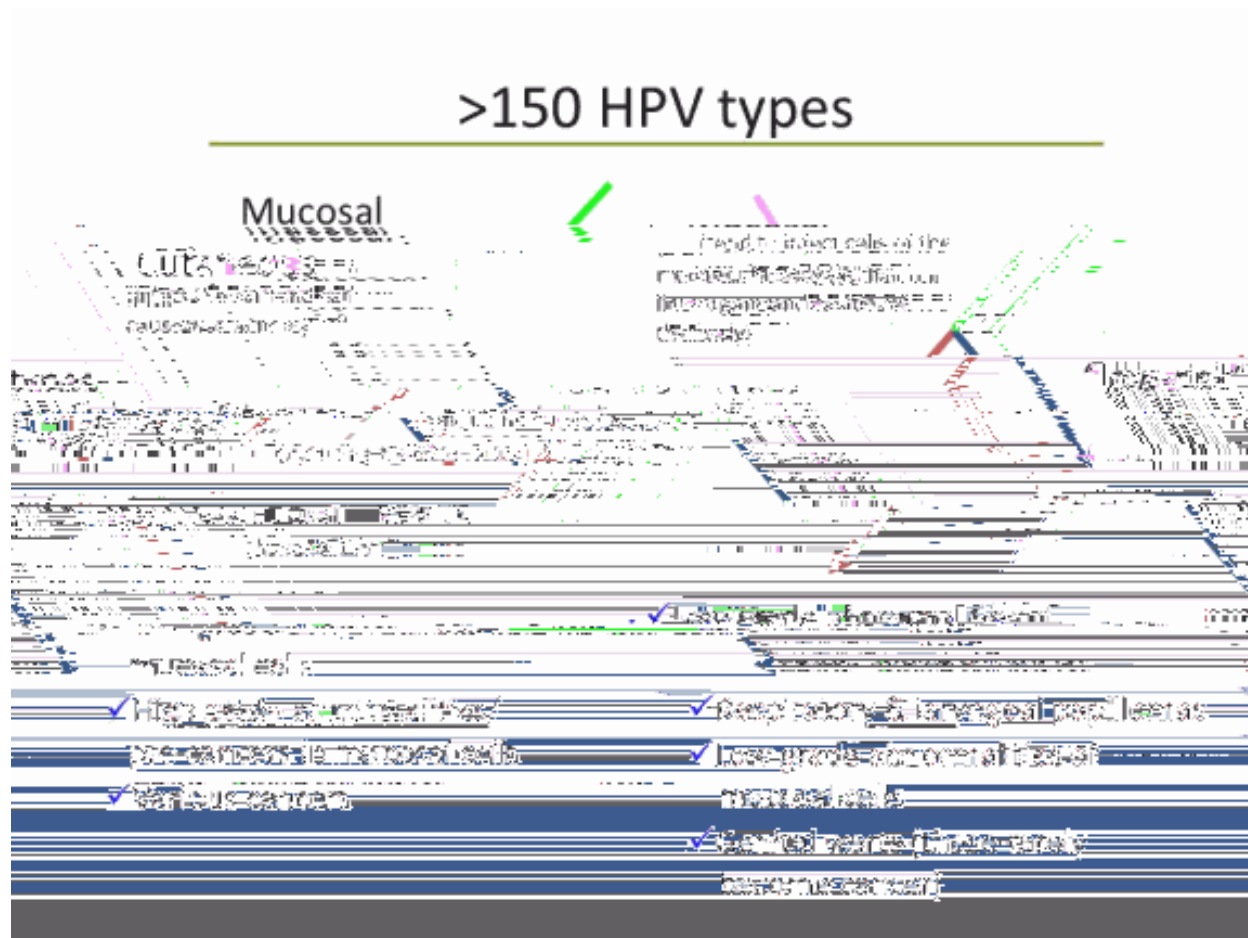
There are more than 200 types of HPV (human papillomavirus). All types of HPV can live only in certain cells called **squamous epithelial cells**. These are normal cells found on the surface of the skin (**cutaneous**) and on moist surfaces and membranes (called **mucosal membranes** or **mucosal surfaces**).

The different types of HPV are identified by numbers and are grouped based on whether they infect cutaneous (skin) cells or mucosal (genital) cells.

- [Cutaneous \(skin\) HPV types](#)
- [Mucosal \(genital\) HPV types](#)
- [Low-risk mucosal types](#)

- **High-risk mucosal types**

This diagram shows the different groups of HPV types and the problems each group can cause.



### Cutaneous (skin) HPV types

Many HPVs are cutaneous types, meaning they invade and live in cells on the skin. **Cutaneous HPVs can cause warts on top of the skin in areas such as hands, feet, arms, and legs.** These are common warts that are only on the skin. They are not the same as genital warts.

### Mucosal (genital) HPV types

Mucous or mucosal membranes are moist surface layers that line organs and parts of the body that open to the outside, such as the:

- Vagina, anus, cervix, and vulva (area around the outside of the vagina)
- Inner foreskin and urethra of the penis
- Inner nose, mouth, and throat
- Trachea (windpipe) and bronchi (smaller breathing tubes branching off the trachea)
- Inner eyelids

Mucosal HPV types invade and live in cells on mucosal surfaces. They are also called **genital** (or **anogenital**) HPV types because they often affect the anal and genital areas that have mucosal surfaces. But these types can also infect the lining of the mouth and throat that also have mucosal membranes.

Mucosal or genital HPV types are further broken down into **low-risk** and **high-risk** types, depending on their ability to cause cancer.

### Low-risk mucosal types

**HPV 6 and HPV 11 are low-risk HPV types. They tend to cause genital warts and rarely cause cancer.** Having a low-risk genital HPV infection can cause cauliflower-shaped warts on or around the genitals or anus. Warts may appear in areas that aren't always noticed, such as the cervix and vagina.

### High-risk mucosal types

**HPV 16 and HPV 18 are high-risk HPV types that can cause cancer.** These HPV types can sometimes avoid the body's immune system, so the body can't get rid of the HPV. The infection can linger over time, causing damage to normal cells that can turn them into abnormal cells, which might later become cancer. In fact, high-risk HPV types are known to cause 6 different types of cancer. Learn more in [Cancers Linked with HPV<sup>1</sup>](#).

### Hyperlinks

1. [www.cancer.org/cancer/risk-prevention/hpv/hpv-and-cancer-info.html](http://www.cancer.org/cancer/risk-prevention/hpv/hpv-and-cancer-info.html)

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## Cancers Linked with HPV

HPV (human papillomavirus) is known to cause many types of cancer in adults, including cancers of the mouth and throat, cervix, vulva, vagina, penis, and anus. More than 37,000 people get HPV-related cancers in the United States every year.

HPV vaccines can prevent more than 90% of HPV cancers when given at the recommended ages. Learn more about vaccination recommendations in [HPV](#)



[Vaccines](#)<sup>1</sup> and about testing options in [HPV Testing](#)<sup>2</sup>.

- [Cervical cancer](#)
- [Vulvar cancer](#)
- [Vaginal cancer](#)
- [Penile cancer](#)
- [Anal cancer](#)
- [Mouth and throat cancer](#)

## Cervical cancer

[Cervical cancer](#)<sup>3</sup> is the most common cancer linked to HPV in people with a cervix. In fact, nearly

all cervical cancers are caused by HPV. **Cervical cancer is preventable with the HPV vaccine**

**and regular screening tests.**

Cervical cancer can be found early and even prevented with routine screening tests. Screening tests that are used include the **HPV test** and **Pap test**. The HPV test looks for an HPV infection. The Pap test looks for changes in cervical cells caused by HPV infection.

## Vulvar cancer

HPV can cause [cancer of the vulva](#)<sup>4</sup>. The vulva is the outer part of the female genital organs. This cancer is much less common than cervical cancer.

There's no standard screening test for cancer of the vulva. Vulvar cancer might be found because a person notices changes or problems in their vulvar area, or because a health care professional sees signs during a routine physical exam.

## Vaginal cancer

Most [cancers of the vagina](#)<sup>5</sup> contain HPV.

Many vaginal pre-cancers also contain HPV, and these changes may be present for years before turning into cancer. These pre-cancers can sometimes be found with the

same screening test that's used to test for cervical cancer and pre-cancers. If a vaginal pre-cancer is found, it can be treated to stop further cell changes that can lead to cancer.

## Penile cancer

HPV can cause [cancer of the penis](#)<sup>6</sup>. Penile cancer is more common in men with HIV and those who have had sex with other men.

There's no standard screening test to find early signs of penile cancer. Because most penile cancers start on the skin of the penis, they may be noticed early.

## Anal cancer

HPV can cause [cancer of the anus](#)<sup>7</sup> in both men and women. Anal cancer is more common in people with HIV and in men who have sex with other men.

Screening tests for anal cancer are not recommended routinely for everyone. Some experts recommend anal cytology testing (also called an **anal Pap test**) for people at higher risk of anal cancer. This includes men who have had sex with men, people who have had cervical cancer or vulvar cancer, or anyone who may have a compromised immune system (ie. HIV-positive, anyone who has had an organ transplant).

## Mouth and throat cancer

HPV is found in many oral ([mouth](#)) and [throat cancers](#)<sup>8</sup>. Most cancers found in the part of the throat behind the mouth are HPV-related. These are the most common HPV-related cancers in men.

There's no standard screening test to find these cancers early. Still, some can be found early during routine exams by a dentist, doctor, or dental hygienist, or by doing self-checks.

## Hyperlinks

1. [www.cancer.org/cancer/cervical-cancer.html](http://www.cancer.org/cancer/cervical-cancer.html)
2. [www.cancer.org/cancer/vulvar-cancer.html](http://www.cancer.org/cancer/vulvar-cancer.html)

3. [www.cancer.org/cancer/vaginal-cancer.html](http://www.cancer.org/cancer/vaginal-cancer.html)
4. [www.cancer.org/cancer/penile-cancer.html](http://www.cancer.org/cancer/penile-cancer.html)
5. [www.cancer.org/cancer/anal-cancer.html](http://www.cancer.org/cancer/anal-cancer.html)
6. [www.cancer.org/cancer/oral-cavity-and-oropharyngeal-cancer.html](http://www.cancer.org/cancer/oral-cavity-and-oropharyngeal-cancer.html)

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## HPV Signs and Symptoms

HPV (human papillomavirus) may not cause any symptoms. Since this virus is spread

through intimate skin-to-skin contact, someone who has HPV might not know it unless they are getting routine testing or if they develop signs and symptoms.

- [How does a person know if they have HPV?](#)
- [What are the symptoms of HPV?](#)

## How does a person know if they have HPV?

Women and other people with a cervix can be tested for HPV infection.

An [HPV test](#)<sup>1</sup> looks for cervical infection from high-risk types of HPV that are more likely to cause pre-cancers and cancers of the cervix.

- HPV testing is usually done by a health care provider using a special tool to gently scrape or brush the cervix (lower part of the uterus) to remove cells for testing. This is done during a routine pelvic exam.
- Another option might be for a person to use a kit to collect a vaginal sample themselves for HPV testing, while being supervised by a health care provider. Testing in this way is called **self-collection** and does not require a pelvic exam.

A [Pap test](#)<sup>2</sup> is a different test, but the sample is collected in the same way as an HPV test done by a health care provider. The difference is what the lab tests look for in the sample. A Pap test is used to find cell changes or abnormal cells in the cervix, while an HPV test is used to look for HPV infection. A Pap test cannot detect HPV.

When testing is done only for HPV, this is called a **primary HPV test**. The US Food and Drug Administration (FDA) has approved certain tests to be primary HPV tests.

When HPV testing is done at the same time as a Pap test, this is called a **co-test**.

Learn more in [HPV Testing](#)<sup>3</sup>.

## What are the symptoms of HPV?

If a person gets HPV, the virus may or may not cause signs or symptoms, depending on which HPV type has infected the person and where the infection is. In most people, the body's immune system is able to get rid of or control the HPV infection on its own. But sometimes, the infection doesn't go away.

Certain people are at higher risk for HPV-related health problems. This means if they are infected with HPV, they are more likely to have symptoms or other problems. This includes people with weak immune systems (including those who have HIV/AIDS).

If HPV does cause symptoms, the symptoms will depend on [which type it is](#) – cutaneous (affecting the skin) or mucosal (affecting the genitals, mouth, or throat).

### **Possible symptoms of cutaneous HPV types**

Cutaneous HPV types live on the skin. These types of HPV can cause **warts on areas such as the arms, chest, hands, or feet.**

### **Possible symptoms of mucosal HPV types**

Mucosal HPV types live inside the body on mucous membranes. Mucous membranes are the moist surface layers that line organs and parts of the body that open to the outside, such as the lining of the vagina, anus, mouth, and throat.

Low-risk mucosal HPVs can sometimes cause **cauliflower-shaped warts around the genitals or anus.** High-risk mucosal HPVs can eventually [cause some types of cancer.](#)

## **Hyperlinks**

1. [www.cancer.org/cancer/types/cervical-cancer/detection-diagnosis-staging/screening-tests/hpv-test.html](http://www.cancer.org/cancer/types/cervical-cancer/detection-diagnosis-staging/screening-tests/hpv-test.html)
2. [www.cancer.org/cancer/types/cervical-cancer/detection-diagnosis-staging/screening-tests/pap-test.html](http://www.cancer.org/cancer/types/cervical-cancer/detection-diagnosis-staging/screening-tests/pap-test.html)
3. [www.cancer.org/cancer/risk-prevention/hpv/hpv-and-hpv-testing.html](http://www.cancer.org/cancer/risk-prevention/hpv/hpv-and-hpv-testing.html)
4. [www.cancer.org/cancer/risk-prevention/hpv/types-of-hpv.html](http://www.cancer.org/cancer/risk-prevention/hpv/types-of-hpv.html)
5. [www.cancer.org/cancer/risk-prevention/hpv/hpv-and-cancer-info.html](http://www.cancer.org/cancer/risk-prevention/hpv/hpv-and-cancer-info.html)

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## How to Protect Against HPV

HPV (human papillomavirus) is a viral infection that can be passed from one person to another.

- [How is HPV spread?](#)
- [Can HPV and HPV-related cancers be prevented?](#)
- [Vaccinate against HPV](#)
- [Protect yourself during sex and skin-to-skin contact](#)
- [Can a person get HPV more than once?](#)

### How is HPV spread?

HPV can be passed from one person to another by intimate skin-to-skin contact. It's not spread through blood or body fluids.

HPV can be spread to someone else even when an infected person has no signs or symptoms. In fact, a person can have HPV for years without it causing any symptoms or

problems.

## Sexual contact

There are different [types of HPV](#). The main way the mucosal types of HPV are spread is through sexual activity, including vaginal, anal, and oral sex. HPV infections are more likely in people who have had many sex partners.

However, it's important to know that anyone who has sexual activity with another person can be at risk for HPV if their partner has been exposed to HPV.

The virus can also be spread by genital contact without sex, but this is not common.

## Childbirth

Transmission from mother to newborn during birth is rare, but it can happen, too. When it does, it can cause warts (papillomas) in the infant's breathing tubes (windpipe and bronchi) and lungs, which is called **respiratory papillomatosis**. These papillomas can also grow in the voice box, which is called **laryngeal papillomatosis**. Both of these infections can cause life-long problems.

## You cannot get HPV from:

- Toilet seats
- Hugging or holding hands
- Swimming pools or hot tubs
- Sharing food or utensils
- Being unclean

## You can have HPV even if:

- It has been months or years since you were sexually active.
- You do not have any signs or symptoms.

There may be other ways to become infected with HPV that aren't yet clear. It's important to know that someone can have the virus and pass it on without knowing it.

## Can HPV and HPV-related cancers be prevented?

There's no sure way to prevent infection with the different types of HPV. But there are things people can do to lower their chances of being infected and to protect children from getting [HPV-related cancers](#) as adults.

The best way to prevent HPV, and future diseases due to HPV, is to get vaccinated.

## Vaccinate against HPV

HPV vaccines can prevent infection with certain types of HPV. They are approved for use in males and females, mainly boys and girls. They can only be used to prevent HPV infection – they don't treat an existing infection. On-time vaccination protects young people from the most common mucosal HPV types that can cause genital warts and cancer later in life.

- To work best, the HPV vaccines should be given to boys and girls between the ages of 9 and 12.
- Teens and young adults ages 13 through 26 years who have not been vaccinated or who have not received all of their shots should get the vaccine as soon as possible. Vaccination of young adults will not prevent as many cancers as vaccination of children and teens.
- The American Cancer Society (ACS) does not recommend HPV vaccination for persons older than 26 years.

Learn more about HPV vaccination in [HPV Vaccines](#)<sup>1</sup>.

## Protect yourself during sex and skin-to-skin contact

It might be possible to keep from becoming infected with HPV by completely avoiding any contact of the areas of your body that can become infected (like the mouth, anus, and genitals). This means not having vaginal, oral, or anal sex.

If you are sexually active, **limiting the number of sex partners** and avoiding sexual activity with people who have had many other sex partners can help lower your risk of exposure to genital HPV. But again, HPV is very common, so having sexual and teens.



before the condom is put on, and male condoms don't protect the entire genital area, especially for women. The female condom covers more of the vulva in women, but it hasn't been studied as carefully for its ability to protect against HPV. Condoms are very helpful, though, in protecting against other infections that can be spread through sexual activity.

## Can a person get HPV more than once?

Yes. Since there are many types of HPV, it's possible to be infected more than once in your lifetime. You may have one type that goes away, but you can get another type. It's also possible to get the same type again, but the risk of this is low.

## Hyperlinks

1. [www.cancer.org/cancer/risk-prevention/hpv/types-of-hpv.html](http://www.cancer.org/cancer/risk-prevention/hpv/types-of-hpv.html)
2. [www.cancer.org/cancer/risk-prevention/hpv/hpv-and-cancer-info.html](http://www.cancer.org/cancer/risk-prevention/hpv/hpv-and-cancer-info.html)
3. [www.cancer.org/cancer/risk-prevention/hpv/hpv-vaccines.html](http://www.cancer.org/cancer/risk-prevention/hpv/hpv-vaccines.html)

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## HPV Testing

Screening for HPV (human papillomavirus) is recommended as part of cervical cancer screening. Screening tests for the virus in people who have no symptoms.

- [How are HPV tests and Pap tests different?](#)
- [What does the American Cancer Society recommend about HPV testing?](#)
- [What about testing for HPV in other parts of the body?](#)

### How are HPV tests and Pap tests different?

- An [HPV test](#)<sup>1</sup> looks for cervical HPV infection. It detects high-risk types of HPV that are more likely to cause pre-cancers and cancers of the cervix. But an HPV test cannot detect pre-cancer or cancer itself.
- A [Pap test](#)<sup>2</sup> is used to find cell changes or abnormal cells in the cervix. A Pap test cannot detect HPV.
- Both the HPV and Pap test are usually done during a speculum exam. Another option for the HPV test is for the person to use a kit to collect a vaginal sample themselves, while being supervised by a health care provider. This is called **self-collection**, and it doesn't require a pelvic exam.
- An HPV test can be done either by itself (**primary HPV testing**) or at the same time as the Pap test (**co-testing**).
- If a Pap test is done by itself and the result is positive (abnormal), the same sample can be used to test for HPV.

If an HPV test is done by itself, and the result is positive (abnormal), the same sample can then be used to test for cell changes or abnormal cells.

## **What does the American Cancer Society recommend about HPV testing?**

The American Cancer Society (ACS) recommends HPV testing as part of a cervical cancer screening plan. ACS recommends:

- People aged 25 to 65 should have a primary HPV test every 5 years.
- If primary HPV testing is not available, screening may be done with either a co-test that combines an HPV test with a Pap test every 5 years, or a Pap test alone every 3 years.
- People who have been vaccinated against HPV should still follow these guidelines for their age groups.

A primary HPV test is better at preventing cervical cancers than a Pap test that is done alone. Having a primary HPV test does not always add more unnecessary tests, which can happen when a co-test is done.

**The most important thing to remember is to get screened regularly, no matter which test you get.**

Learn more in [The American Cancer Society Recommendations for the Prevention and Early Detection of Cervical Cancer Screening<sup>3</sup>](#).

## **What about testing for HPV in other parts of the body?**

The FDA has only approved tests to find HPV in the cervix. Any abnormal (positive) results are managed with extra testing and prompt treatment if the infection causes abnormal cell growth.

Research is still being done on HPV tests for other parts of the body. For example:

- There are commercially available oral HPV tests that are not yet FDA-approved or included in screening guidelines. However, some dentists use them.
- Doctors often recommend that high-risk men and some high-risk women get anal HPV testing.



# HPV Vaccines

**HPV (human papillomavirus) vaccination is cancer prevention.** This is why it is important that all children get vaccinated against HPV.

- [What is the HPV vaccine?](#)
- [What does the HPV vaccine get it?](#)
- [When should the HPV vaccine be given and who should get it?](#)
- [What are 10 2GS68 should get it? ocommendvaccis forld the HPV vacciget it?](#)

It also protects against several high-risk mucosal HPV types, including:

- HPV-16 and HPV-18, which cause most [cervical cancers](#)<sup>1</sup> and pre-cancers, as well as many cancers of the [anus](#)<sup>2</sup>, [penis](#)<sup>3</sup>, [vulva](#)<sup>4</sup>, [vagina](#)<sup>5</sup>, and [mouth and throat](#)<sup>6</sup>
- Other high-risk HPV types: 31, 33, 45, 52 and 58

Research is being done to test a vaccine that will protect against other cancer-causing types of HPV as well.

## When should the HPV vaccine be given and who should get it?

The HPV vaccine is strongly recommended for all boys and girls. Since vaccines are used to help prevent diseases, children are vaccinated for diseases before being exposed to the infection that causes the disease.

Most people in the US have skin-to-skin contact that can spread HPV during their teens and early twenties. So, it's best to get the vaccine before this. The body also produces the strongest immune response against HPV when the vaccine is given in this age range.

The HPV vaccine works best in children and pre-teens. Vaccination at the recommended ages of 9 to 12 will prevent more cancers than vaccination at older ages, with cancer prevention decreasing as age at vaccination increases.

**Pregnant women** should not get any HPV vaccine at this time, even though they appear to be safe for both mother and the unborn baby. If a woman who is pregnant does get an HPV vaccine, it's not a reason to consider ending the pregnancy. Women who started a vaccine series before they learned they were pregnant should complete

## vaccination?

The American Cancer Society recommends:

- Girls and boys should get 2 doses of the HPV vaccine between the ages of 9 and 12.
- Teens and young adults ages 13 through 26 who have not been vaccinated, or who haven't gotten all their doses, should get the vaccine as soon as possible. Vaccination of young adults will not prevent as many cancers as vaccination of children and teens.
- The ACS does not recommend HPV vaccination for people older than age 26 years.

## Does the HPV vaccine work?

**The HPV vaccine works very well.** Studies have shown that the vaccine provides nearly total protection against infections and pre-cancers caused by the types of HPV that cause 90% of HPV cancers as well as 90% of genital warts.

Research done so far shows that the protection against HPV infection does not seem to decrease with time. Research will continue to look at how long protection against HPV lasts, and if booster shots will be needed.

## Is the HPV vaccine safe?

HPV vaccines have been used since 2006. HPV vaccines went through extensive safety testing before becoming available. Hundreds of million doses of the HPV vaccine have been given worldwide.

Like any vaccination, there may be common mild side effects from the HPV vaccine that usually go away quickly, like headache or fever. There can be pain, redness, and/or swelling where the shot was given. A small number of people may have a more serious side effect that could occur with any vaccine, such as an allergic reaction or fainting when the vaccine is given. Anyone who has a severe allergy to yeast or any other ingredient in the vaccine should not receive the HPV vaccine.

**The HPV vaccine is safe.** The ingredients in the HPV vaccine, like all vaccines, help make sure that it is effective and safe. These ingredients occur naturally in the environment, the human body, and foods. For example, the HPV vaccine contains

aluminum like the hepatitis B and Tdap vaccines. Aluminum boosts the body's immune response to the vaccine. People are exposed to aluminum every day through food, cooking utensils, water, and even breast milk. Aluminum-containing vaccines have been used for decades and have been given safely to many billions of people.

Scientists and health organizations around the world closely monitor the safety of HPV vaccines. Hundreds of studies in millions of people worldwide have shown that the HPV vaccine is safe.

In the US, vaccine safety is watched by several national systems that work together to make sure that any harmful effects of vaccines can be found early. The US Centers for Disease Control and Prevention (CDC) and the US Food and Drug Administration (FDA) review all serious side effects reported to the Vaccine Adverse Event Reporting



Most insurance plans cover the HPV vaccine cost if it is given according to national guidelines, between ages 9 and 26. But it's a good idea to check with your insurance



Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

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