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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](#)

The HPV vaccine can protect your child's future because it helps prevent six types of cancer later in life. Find information about HPV vaccination here!

### [HPV for Adults: Prevention, Testing, and Cancer](#)

Learn about HPV and its link to cancer, how HPV is spread, and HPV vaccination.

### [It's True: You Can Help Prevent Cervical Cancer](#)

The tests for cervical cancer screening are the HPV test and the Pap test.

### [Know Your Cancer Risk](#)

Take the ACS CancerRisk360™ assessment to learn more about what you can change to improve your health. By taking 5 minutes to answer a few questions, we will give you a personalized roadmap of actions with helpful resources you can use to lower your risk of cancer.

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## What Is HPV (Human Papillomavirus)?

HPV is a virus and is short for **human papillomavirus**. There are many types of HPV that are part of a large group of related viruses.

- [What is a virus?](#)
- [Are there different types of HPV?](#)
- [How common is HPV?](#)
- [How is HPV different from herpes?](#)
- [What is the treatment for HPV?](#)

### What is a virus?

A virus is a very small organism – so small that most cannot be seen even with a regular microscope.

Viruses cannot reproduce on their own. To make more viruses, they need to be in a **host environment**, such as a living person. When a virus enters the host's body, it invades some of the host's cells. These host cells contain the tools that the virus needs to reproduce and make more viruses.

Viruses can enter the body in different ways, including:

- Through the mucous membranes (such as the inner lining of the nose or mouth, the lining of the eyes, or the lining of the genitals)
- Through the digestive system (such as the lining of the stomach or intestines)
- Through insect bites, needle sticks, wounds, or other breaks in the skin
- Through unbroken skin

Once inside the body, the virus infects a specific type of cell, where it can live and reproduce. For example, HPVs can live only in certain cells called **squamous epithelial cells**, which are found on the surface of the skin and on moist surfaces and membranes (called **mucous or mucosal membranes** or **mucosal surfaces**).

The signs and symptoms of a viral infection depend on the type of virus. They tend to be mostly in the areas where the virus has invaded and reproduced. For example, cold and flu viruses enter the body and then invade the cells that line the respiratory tract (nose, sinuses, breathing tubes, and lungs).

## Are there different types of HPV?

HPVs are a group of more than 200 related viruses. Each **HPV type** has a number. For example, HPV 6, HPV 11, HPV 16, and HPV 18 are just 4 types of HPV that a person might have. If a person tests positive for HPV, knowing the HPV type is important. It helps doctors and nurses decide what kind of follow-up testing is needed. See [Types of HPV](#) to learn more.

HPVs are called **papillomaviruses** because some HPV types cause **papillomas**. Papillomas are warts and are not cancer. But some types of HPV are known to cause cancer, including cancers of the cervix (the base of the womb at the top of the vagina), vagina, vulva (the area around the outside of the vagina), penis, anus, and parts of the mouth and throat. See [Cancers Linked with HPV](#) for more about this.

## How common is HPV?

HPV is very common. The Centers for Disease Control (CDC) estimates that about 42 million people are currently infected with HPV in the United States, and about 13 million people in the US get a new HPV infection every year. This includes teenagers and adults.

In most people infected with HPV, the body gets rid of or controls the infection on its

own. But sometimes, the infection doesn't go away. Chronic, or long-lasting HPV

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)
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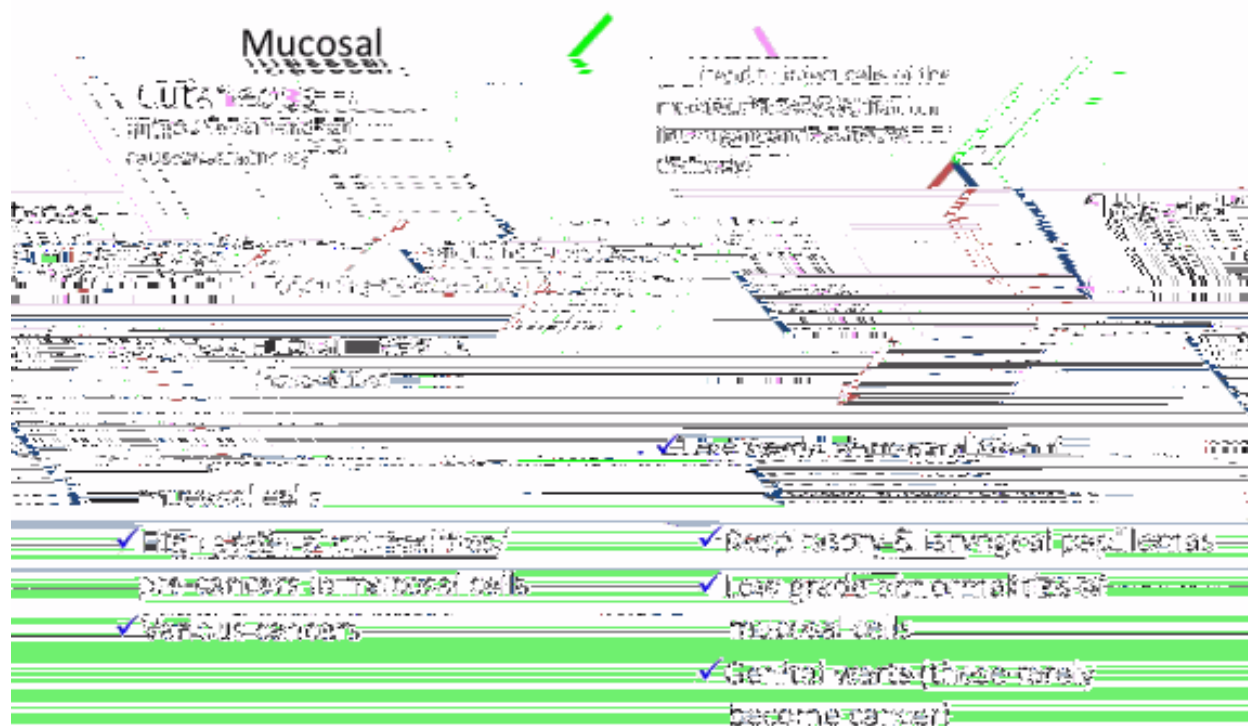
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National Cancer Institute. HPV gs (-0ipnccer)TjDE0r2picanuals

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## >150 HPV types



### 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**



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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](#) and about testing options in [HPV Testing](#).

- [Cervical cancer](#)
- [Vulvar cancer](#)
- [Vaginal cancer](#)

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

## Cervical cancer

[Cervical cancer](#)<sup>1</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>2</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

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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](#).

## 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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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 work0 g E 12 76HPV vaccines should be given to boys and girls between 2 7



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](#).

## 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)

# HPV Testing

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

- [How are HPV tests and Pap tests different?](#)
- [What is mRNA E6/E7 detection?](#)
- [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**).

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## 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

or years.

## Hyperlinks

1. [www.cancer.org/cancer/types/cervical-cancer/detection-diagnosis-staging/screening-tests/hpv-test.html](https://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](https://www.cancer.org/cancer/types/cervical-cancer/detection-diagnosis-staging/screening-tests/pap-test.html)
3. [www.cancer.org/cancer/types/cervical-cancer/detection-diagnosis-staging/cervical-cancer-screening-guidelines.html](https://www.cancer.org/cancer/types/cervical-cancer/detection-diagnosis-staging/cervical-cancer-screening-guidelines.html)

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# 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 do?](#)
- [When should the HPV vaccine be given and who should get it?](#)
- [What are the American Cancer Society recommendations for HPV vaccination?](#)
- [Does the HPV vaccine work?](#)
- [Is the HPV vaccine safe?](#)
- [How long does the HPV vaccine last?](#)
- [Does the HPV vaccine affect fertility?](#)
- [Do people who were vaccinated for HPV need to be tested for HPV?](#)
- [How much does the HPV vaccine cost?](#)

## What is the HPV vaccine?

HPV vaccines can help protect children and young adults from some HPV infections. These vaccines are used to prevent some types of cancer that can result from an HPV infection. They will not treat an HPV infection. And they will not protect against cancer if a person already has an HPV infection.

Gardasil 9 is the only HPV vaccine available in the US. Other HPV vaccines are available outside the US, but these don't protect against as many types of HPV as Gardasil 9 does.

Each vaccine requires a series of injections (shots) – either 2 or 3 depending on a person's age. The injections are most often given in the muscle of the upper arm. Research is still being done on giving just 1 dose of HPV vaccine.

## What does the HPV vaccine do?

Giving the vaccine to boys and girls between 9 and 12 years old can prevent more than 90% of HPV-related cancers when they get older.

The vaccine helps prevent infection from 2 low-risk cutaneous HPV types: HPV-6 and HPV-11.

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 the series after the pregnancy.

Make sure the health care provider knows about any **severe allergies**. The following people should not get an HPV vaccine:

- Those with a severe allergy to yeast should not receive Gardasil 9.
- Anyone who has ever had a life-threatening allergic reaction to anything else contained in the vaccine
- Anyone who has had a serious reaction to an earlier dose of HPV vaccine

## What are the American Cancer Society recommendations for HPV

## 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





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 plan to be sure.

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The American Cancer Society medical and editorial content team

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