

# HPV

## In Perspective

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This guide is published by the American Sexual Health Association (ASHA), a nonprofit organization founded in 1914 and dedicated to improving the health of individuals, families, and communities, with a focus on preventing sexually transmitted infections and their harmful consequences. In the last decade, ASHA has added to its agenda an initiative specific to the increasingly recognized problem of human papillomavirus (HPV).

Our HPV Resource Center offers the vital service of accurate information tailored to address the questions and concerns most central to people affected by the virus and their partners. With an expert panel of scientists to guide our work, ASHA's HPV Resource Center also provides a useful resource for healthcare professionals.

We hope this guide serves as a useful overview and reference for all readers. Keep in mind that further updates are available through websites, including HPV News at [www.hpvnews.org](http://www.hpvnews.org).

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## INTRODUCTION

If you're like a lot of people, you may not have even heard of the human papillomavirus (HPV) until it affected you. You might have gone to the doctor to see about some bumps you noticed and the doctor said it was genital warts, which is caused by HPV. Or, you may have simply gone to your doctor for a Pap test and the results came back as abnormal—and then found out that, many times, this is due to HPV.

You may not have known whether to panic or brush it off. You may have wondered how this condition could just sneak up on you this way. And most of all, you probably had questions: How serious is it? Where did I get it? Will it go away?

Some of your questions probably even the best doctor couldn't answer—for the simple reason that not all answers are yet known. Because of this, you may have felt frustration and confusion. You may have concerns about how to protect others or whether you are at risk for cervical cancer. Rest assured that these are normal worries, and getting the facts can alleviate many of these concerns. By reading this booklet and becoming educated, you are taking the first steps to understanding this common virus and keeping it in perspective.

Understanding just what HPV is and how it behaves in the body can do much to resolve your concerns. The goal of *HPV in Perspective* is to give you the latest information on what is known about HPV symptoms, and the treatment options. We will also examine the link between HPV and cervical cancer so that your actual risk can be put into better perspective.

Though you may feel overwhelmed now, especially if you've only recently been diagnosed, in time you will likely find that HPV is a relatively small issue in the context of your overall health.

## WHAT IS HPV?

HPV is a very common virus. There are over 100 known human papillomaviruses. Because they are all very similar to each other, they are referred to as HPV types (or genotypes). Each HPV type has been given a number based on the order of discovery.

HPV was first noticed as the virus that causes warts. Some types are found on the hands and feet; others, the face; and still others (about 30 types) are mostly found in the genital area.

Some types of HPV in the genital area will cause warts. Sometimes these warts are easily visible to the naked eye, but HPV also can cause infections that cannot readily be seen. Other types of HPV are linked to abnormal cell changes on the cervix (detected through Pap tests) that can lead to cervical cancer.

Genital HPV types associated with warts are called "low-risk" types. Other types of HPV, associated with cervical

cancer and some other cancers, are referred to as "high-risk" types.

## Symptoms or No Symptoms

Most people with HPV do not experience any visible symptoms. Some studies estimate as many as 75-80% of sexually active individuals actually have, or at some point have had, an HPV infection—and most never know it.<sup>1</sup> Because there are so many types of HPV, it is not unusual for a person to have more than one type.

It's unclear exactly why some people have symptoms and others do not, but it is thought the immune system plays a role in keeping HPV in check. For some, the immune system may work quickly against the virus, and they will have no symptoms at all. For others, the immune response may not kick in until after symptoms arise. But most HPV infections are eventually cleared by the immune system, so that even when symptoms appear, they may go away on their own without treatment.



The type of HPV involved also influences the kind of symptoms someone might have and whether or not it will go away without treatment. While both high-risk and low-risk HPV types occur on the outer genitals or up inside the genital area (such as on female's cervix, which is the opening to the uterus), high-risk types are more common inside and low-risk types are more common outside.

The most common symptoms of HPV include **external genital warts** (associated with low risk HPV) and **abnormal cell changes in the cells of the cervix** (associated with high risk HPV).

How long does it take for HPV symptoms, such as warts or cervical dysplasia, to develop? For many people, the immune system seems to manage the virus and symptoms never appear or are taken care of before the person recognizes them. When symptoms do appear, it is almost impossible to know when that infection occurred. While most researchers believe that symptoms can appear between a few weeks to 8 months after a person is infected with HPV, it can sometimes take years for symptoms to show up.

### Genital Warts

Genital warts can widely vary in appearance. Most cases of warts are noticed in the external genital area. They may be raised or flat, single or multiple (such as a "cauliflower" formation), small or large. Most warts are usually flesh-colored, but they may sometimes have different coloring. Typically, warts are painless and cause no other symptoms, but they can occasionally cause itching, irritation, or bleeding.

The most common type of wart, when warts do appear, is the raised, "cauliflower" type of wart, although "flat" warts can also occur. For women, warts can be found around or in the vagina, on the vulva (lips of vagina), anus, or sometimes on the cervix. For men, warts can appear around the penis, scrotum, and/or anus. See pages XX for information on how warts are diagnosed and treated.

### Abnormal Cell Changes

High-risk HPV can cause abnormal changes to the cells of a woman's cervix. These changes are sometimes called dysplasia, cervical intraepithelial neoplasia (CIN), squamous intraepithelial lesions (SIL), or pre-cancerous changes. These terms have similar meaning and are sometimes used interchangeably by healthcare providers. Most of this booklet will focus on cellular changes in the cervix since it is more commonly screened for and diagnosed than cell changes on other parts of the genital area. We will most often refer to these changes as cervical dysplasia.

Cervical dysplasia may be the result of either high-risk or low-risk HPV types. Dysplasia associated with high-risk HPV types that do not go away (persistent infection) requires the most attention. Cervical dysplasia does not usually cause any other symptoms such as pain or bleeding. In fact, a woman may not realize anything is happening until she has an abnormal Pap test result. In many cases, HPV is the cause of the dysplasia.

The cervix seems to be more prone to HPV-associated changes than other areas of the body in women. At the cervix, cells lining the opening to the uterus meet the kind of cells lining the rest of the vagina. The cells of the inside of the uterus are gland-forming, and those in the vagina form a protective covering called a squamous epithelium. The region of the cervix where the cells change (or transform) from one type to the other is called the "transformation zone." This zone changes with hormones and inflammation and is the site of most dysplasias.

Other regions in the body where there is a change in cell type, such as at the anus, or penile foreskin, are also more likely to be susceptible to HPV. Dysplasias in areas besides the cervix (such as the penis, outer vagina, or anus, for example) are also not readily visible to the naked eye, and magnification or other ways to highlight the changes may be needed.



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*HPV is spread through skin-to-skin contact, not through an exchange of bodily fluid. HPV can infect anyone who has ever had a sexual encounter.*

## HOW DOES SOMEONE GET HPV?

HPV is typically passed from person to person by direct skin-to-skin contact. Sexual contact is by far the most common form of transmission among those who are sexually active. Genital HPV types target the moist, pinkish tissue known as mucous membranes and other areas of skin around the genitals. So the most common way HPV is passed on is by direct contact between infected skin on the penis, scrotum, vagina, vulva, or anus and uninfected skin in the same areas of the partner's body. Because HPV is a skin virus, it is not produced in blood or body fluids.

Because most HPV infections are not visible to the naked eye, including warts, it is easy for someone infected with HPV to pass it on unknowingly. Even when symptoms of HPV aren't visible, the virus can still be passed on. Even visible warts may be in areas that aren't easily seen, like the inside of the vagina. Also, genital skin is covered with its share of natural bumps—knowing which are warts and which are not can be difficult.

What about oral sex (mouth-to-genital contact)? The exact risks aren't as clear as with genital-to-genital contact, but research has shown a link between HPV and oral sex (although the overall risk is lower than with genital-to-genital contact or anal sex). Some head and neck cancers—primarily those affecting the back of the tongue, tonsils, and side and back of the throat—are HPV-related but such cancers are uncommon and usually take many, many years to develop.<sup>2</sup> Keep in mind that oral sex is a routine sexual practice among millions of couples, yet people are not frequently diagnosed with head and neck diseases associated with HPV.

While people can get warts in the mouth or voice box (larynx), usually due to low-risk types of HPV, these are uncommon. As many of these cases occur in children, researchers suspect that the virus was transmitted during birth. This rare condition of recurring warts in the voice box and breathing tubes is called "recurrent respiratory papillomatosis" and begins most commonly in childhood, but can also occur in adulthood.

## HPV VACCINES

There are currently three HPV vaccines available. **Gardasil®** is vaccine available for both males and females. Developed by Merck, Gardasil® is close to 100% effective at preventing infection associated with HPV types 6 and 11 (types associated with 90% of all genital warts) and types 16 and 18 (types associated with 70% of all cervical cancers, and many anal, vulvar and vaginal cancers). **Cervarix®**, developed by GlaxoSmithKline (GSK) is a vaccine just for women. This vaccine is also close to 100% effective at preventing infection associated with HPV 16 and 18 (associated with 70% of all cervical cancers). Studies suggest Cervarix® also offers cross-protection against other "high risk" HPV types. **Gardasil 9®** was approved in December 2014. The new vaccine covers nine HPV types: the two low-risk types that cause most cases of genital warts (HPV 6 and HPV 11) along with seven high-risk types (HPV 16, 18, 31, 33, 45, 52, and 58) found in a number of cancers, including about 90% of cervical cancers around the world as well as most anal, vulvar, and vaginal cancers.

Why are the vaccines recommended at such young ages? The vaccines are most effective when given before someone becomes sexually active, so protection is in place before they are exposed to HPV. While vaccination rates among girls and young women are still low (as of 2010, only 49% of girls between the ages of 13 and 17 had received at least one dose of the vaccine, and only 32% completed all three doses), rates of infection with strains of HPV covered by the vaccines have dropped significantly. Researchers comparing HPV infections rates among females ages 14-19 in years before (2003-2006) and after (2007-2010) the first HPV vaccine became available found a 53% drop in infection rates for the HPV types covered by the vaccine.<sup>3</sup>

So HPV vaccines have proven to be highly effective, but are they safe? HPV vaccines have been used in many countries around the world for several years, and both vaccines appear to be safe and well tolerated. There have been some mild to moderate reactions reported from people who have received the vaccines, the most common of which is pain, redness, and swelling around where the shot was given. Other mild reactions reported include fever, headache, fatigue, nausea and vomiting. Some people have experienced fainting as well.

Some parents have also expressed a concern that vaccinating their children against HPV will lead to increased sexual behavior. But several studies have shown this not to be the case. While many studies relied upon self-reported behavior about sexual activity, a 2012 study published in the journal *Pediatrics* instead looked at medical data including pregnancy, sexually transmitted infection testing or diagnosis, and contraceptive use as evidence of sexual activity. The researchers found that HPV vaccination in the recommended ages was not associated with increased sexual activity.<sup>4</sup>

*Both males and females can benefit from being vaccinated against HPV.*



In addition to sexual contact, there are other ways that someone can be exposed to the virus. This fact is especially important when considering infection in children. While the possibility of sexual abuse should never be carelessly put aside, there are also other explanations for HPV infections in children. In some young children with genital warts, further investigation revealed non-genital types of HPV that in all likelihood were transmitted from hand warts to the genitals through routine care such as diaper changing.

It is also possible that HPV can be transmitted by objects, like a towel or clothing, that carry infectious material from one person to another. In the end, science simply doesn't currently have the tools to pin down explanations for these rare instances of suspected nonsexual transmission.

There's also the problem of figuring out when you were exposed. As mentioned above, symptoms can show up weeks, months or even years after someone is infected with HPV. Such inconsistencies can be difficult to understand or accept, especially for partners in long-term relationships who assume that a recent infidelity must be to blame. But research shows that HPV can stay inactive, in the body for long periods. For example, it has been found that patients with a weakened immune system who have been sexually inactive for many years can suddenly develop warts or abnormal Pap results due to HPV.

With all these questions about transmission, you may be wondering if it's possible to protect yourself or others. The next section will discuss the issue of reducing the risk of getting HPV.

## IS PREVENTION POSSIBLE?

When it comes to protecting yourself—and your sexual partners—from sexually transmitted infections (STIs) such as HIV, gonorrhea and chlamydia, the answer seems simple: condoms. But in the case of HPV, the question of protection is more complicated.

Overall, condoms are still the best protection against most STIs (including HIV) for those who choose to be sexually active. Like HPV, a number of other common STIs may not cause signs or symptoms but can be easily spread during unprotected sex. So condoms are an option worth talking about and using consistently. They are

available in both latex and polyurethane, can be used with all sorts of lubricants, and are made in models for both men and women.

It is important to point out that condoms do not entirely prevent transmission of skin viruses such as HPV. Because HPV is only produced in skin and mucous membranes and not in semen, vaginal secretions, or blood, HPV is typically passed by skin-to-skin contact. While condoms provide a physical barrier, they do not cover the entire genital area. HPV can affect areas of skin not covered by either the male or female condom, so protection from skin-to-skin contact is limited. However, even though condoms only provide limited protection against HPV, they do provide some benefit. One study with heterosexual couples found the risk of getting HPV among females was reduced by 70% when male partners consistently used condoms.<sup>5</sup>

There are no specific recommendations for using barriers like condoms or dental dams to reduce the risk of passing HPV through oral sex. One thing you can do is to avoid direct mouth-to-genital contact if warts are present until they go away with treatment (or by themselves) and the skin has healed. As a general precaution for reducing the risk of most STIs through oral sex, some couples choose to use latex condoms and/or dental dams.

Another question still unresolved by the scientific community is when and for how long—an HPV infection is contagious. In general, researchers believe that transmission is most likely when a person has visible warts, and that treating warts decreases that possibility. But many researchers think that subclinical infections (infections with no visible symptoms) are also contagious, and even patients whose lesions have been successfully treated may still have HPV for some time. If you have been treated for genital HPV, and have had no signs (such as warts or cervical abnormalities) for a year or more, most experts would consider the risk of HPV transmission to be extremely low. Unfortunately, no one knows for sure how long someone might be contagious, or when symptoms may reappear.

Given all unanswered questions about prevention, what are the reasonable steps to take after being diagnosed with HPV?