

# HPV Vaccine Information for Clinicians



**HPV VACCINE IS CANCER PREVENTION**

CDC recommends HPV vaccination for girls and boys at ages 11 or 12 years to protect against cancers caused by HPV infections. CDC encourages clinicians to recommend HPV vaccination the same way and same day they recommend other routine adolescent vaccines.

## Background

**Human papillomaviruses (HPV) are a very common family of viruses that infect epithelial tissue of males and females.** More than 150 HPV types have been identified. Most HPV types infect cutaneous epithelial cells and cause common warts, such as those that occur on the hands and feet. Approximately 40 HPV types can infect mucosal epithelial cells, such as those on the genitals, mouth, and throat. Although most HPV infections are asymptomatic and resolve spontaneously or become undetectable, some HPV infections can persist and lead to cancer.

Persistent infections with high-risk (oncogenic) HPV types can cause:

- cervical, vaginal, and vulvar cancers in women;
- penile cancers in men;
- and oropharyngeal and anal cancers in both men and women.

High-risk types HPV 16 and 18 account for 80% of cancers caused by HPV. Infection with low-risk HPV types can cause genital warts and, rarely, laryngeal papillomas. These types can also cause benign or low-grade cervical cell abnormalities. Almost all genital warts and papillomas are caused by common low-risk types HPV 6 and 11.

## HPV Infection and Disease

**Almost every person will acquire an HPV infection at some time in his or her life.** Currently, about 79 million Americans are infected with genital HPV. Approximately 14 million people become newly infected each year, mostly teens and young adults.

Every year in the United States, an estimated 32,500 men and women are diagnosed with a cancer caused by HPV infection. Although cervical cancer is the most well-known of the cancers caused by HPV, HPV also causes approximately 20,000 non-cervical cancers every year in the United States. Around 10,100 men in the United States are diagnosed with oropharyngeal cancer caused by HPV infection each year.

Even with screening and treatment, roughly 12,000 women are diagnosed with cervical cancer every year in the United States; subsequently, more than 4,000 women die every year from cervical cancer in the country.

## HPV Cancer Screening

**Cervical cancer is the only HPV cancer doctors routinely screen for, and the others may not be detected until they cause health problems. Therefore, preventing infections is a priority.** Cervical cancer screening is recommended for women, beginning at age 21 years and continuing through age 65 years. Women who have received HPV vaccine should still be screened for cervical cancer beginning at age 21 years, in accordance with currently published cervical cancer screening guidelines.

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## HPV Vaccines

The 9-valent HPV (9vHPV) vaccine is the only HPV vaccine currently used in the United States. Three HPV vaccines were licensed by the U.S. Food and Drug Administration (FDA) by 2014: bivalent (2vHPV), quadrivalent (4vHPV), and 9-valent HPV vaccines. Since late 2016, only 9-valent HPV vaccine is available for distribution in the United States. The 9-valent HPV vaccine protects against nine HPV types, including seven types that can cause cancer. Of the 32,500 cancers that HPV has caused every year, 30,000 are caused by strains that could have been prevented by the 9-valent HPV vaccine.

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## HPV Vaccine Recommendations

CDC recommends routine HPV vaccination for adolescents at age 11 or 12 years. Vaccination can be started as early as age 9 years.

For people who did not start or complete vaccination when they were younger, vaccination is also recommended for:

- males ages 13 through 21 years,
- females ages 13 through 26 years,
- gay, bisexual, and other men who have sex with men, transgender people,
- and persons with certain immunocompromising conditions ages 22 through 26 years

Ideally, people should be vaccinated as adolescents, before they are exposed to HPV. However, people who have already been infected with one or more HPV types can still get protection from other HPV types covered by the vaccine.



### HPV vaccines *can* safely be given to...

- People with minor acute illnesses, such as diarrhea or mild upper respiratory tract infections, with or without fever.
- Women who have had an unclear or abnormal Pap test, a positive HPV test, or genital warts. However, these women should be advised that the vaccine may not have any therapeutic effect on existing Pap test abnormalities, HPV infection, or genital warts.
- People with immunocompromising conditions, including certain diseases or medications. However, the immune response to vaccination and effectiveness of the vaccine might be less than in people with a normally functioning immune system.
- Women who are breastfeeding.



### HPV vaccines *should not* be given to...

- People with a history of allergies to any vaccine component. 9-valent HPV vaccine is not recommended for people with immediate hypersensitivity to yeast.
- Patients with moderate or severe acute illnesses. In these cases, patients should wait until the illness improves before getting vaccinated.
- Pregnant women. However, HPV vaccines have not been shown to cause any adverse pregnancy outcomes or adverse events for the mother or her developing fetus. If a woman is found to be pregnant after starting the HPV vaccine series, any remaining doses should be delayed, and given after she is no longer pregnant.
  - Pregnancy testing is not needed before vaccination. If a pregnant woman does receive HPV vaccine, no intervention is needed.
  - Exposure to 9vHPV vaccine during pregnancy can be reported to the manufacturer.

## HPV Vaccine Dosing Schedules

- If the first dose of HPV vaccine is given before the 15th birthday, vaccination should be completed according to a 2-dose schedule. In a 2-dose series, the second dose is recommended 6–12 months after the first dose (0, 6–12 month schedule).
- In a 2-dose schedule of HPV vaccine, the minimum interval is 5 months between the first and second dose. If the second dose is administered at a shorter interval, a third dose should be administered 6-12 months after the first dose and a minimum of 12 weeks after the second dose.
- If the first dose of any HPV vaccine is given on or after the 15th birthday, vaccination should be completed according to a 3-dose schedule. In a 3-dose series, the second dose is recommended 1–2 months after the first dose, and the third dose is recommended 6 months after the first dose (0, 1–2, 6 month schedule).
- In a 3-dose schedule of HPV vaccine, the minimum intervals are 4 weeks between the first and second dose, 12 weeks between the second and third dose, and 5 months between the first and third dose. If a vaccine dose is administered at a shorter interval, it should be re-administered after another minimum interval has been met since the most recent dose. If the third was administered on or before December 16, 2016, the minimum interval between the 1st and 3rd dose is 16 weeks.

Although minimum intervals are stated in the dosing schedule, there is no maximum interval. There is no reason to restart the vaccine series if the HPV vaccine schedule is interrupted; patients who have exceeded the minimum interval for the next dose by months or even years, may be given the next dose needed.

9-valent HPV vaccine may be used to continue or complete a vaccination series started with quadrivalent or bivalent HPV vaccines. There is no ACIP recommendation regarding additional 9-valent HPV vaccine doses for people who have completed the vaccine series with bivalent or quadrivalent HPV vaccine.

HPV vaccine can be administered safely at the same visit as other vaccines recommended for adolescents at ages 11 or 12 years, such as tetanus toxoid, reduced diphtheria toxoid and acellular pertussis (Tdap) vaccine; quadrivalent meningococcal conjugate (MenACWY) vaccine; and influenza vaccine. Administering all indicated vaccines at a single visit increases the likelihood that adolescents receive their vaccinations on schedule at ages 11 or 12 years.

Patients should be observed for 15 minutes after receiving any vaccine, including HPV vaccine.

## HPV Vaccine Safety

**HPV vaccine is very safe.** All vaccines used in the United States, including HPV vaccine, are required to go through years of extensive safety testing before they are licensed by the U.S. Food and Drug Administration (FDA). During clinical trials conducted before they were licensed:



9-valent HPV vaccine was studied in more than 15,000 males and females



Quadrivalent HPV vaccine was studied in more than 29,000 males and females



Bivalent HPV vaccine was studied in more than 30,000 females



Each of these HPV vaccines was found to be safe and effective

As with all approved vaccines, CDC and the FDA closely monitor the safety of HPV vaccines after they are licensed. With over 100 million doses distributed in the United States, HPV vaccine has a reassuring safety record backed by 10 years of monitoring and research.

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## HPV Vaccine Safety (cont.)

Like any vaccine or medicine, HPV vaccination can cause side effects. The most common side effects are mild and include pain, redness, or swelling in the arm where the shot was given; dizziness, fainting, nausea, and headache. Fainting (syncope) after any vaccine, including HPV vaccine, is more common among adolescents.

To prevent fainting and injuries related to fainting, adolescents should be seated or lying down during vaccination and remain in that position for 15 minutes after the vaccine is given. Scientific research shows the benefits of HPV vaccination far outweigh any potential risk of side effects.

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## HPV Vaccine Effectiveness

**HPV vaccine works extremely well.** HPV vaccine was first recommended in the United States in 2006, and by 2014, HPV infections responsible for the majority of HPV cancers and genital warts decreased by 71% in teen girls and 61% among young women. Research has also shown that genital warts and cervical dysplasias are decreasing in teens and women in their early 20s since HPV vaccines have been in use. Decreases in vaccine-type prevalence, genital warts, and cervical dysplasia also have been observed in other countries with HPV vaccination programs.

There is no data to suggest HPV vaccine will treat existing diseases or conditions caused by HPV. However, people who already have HPV-associated diseases or conditions can still get protection from other HPV types covered by the vaccine.

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## Duration of Vaccine Protection

**Studies suggest that HPV vaccine offers long-lasting protection against HPV infection and disease caused by HPV infection.** Studies have followed vaccinated individuals for about ten years, and so far no evidence of protection decreasing over time has been found. Duration of protection provided by HPV vaccination will continue to be studied.

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## Paying for HPV Vaccine

**As with all vaccines recommended by the Advisory Committee on Immunization Practices (ACIP), HPV vaccines are covered by health insurance.** For families who need assistance paying for HPV vaccine, the Vaccines for Children (VFC) program may be able to help. VFC provides vaccines for children ages 18 years and younger who are uninsured, Medicaid-eligible, or American Indian/Alaska Native. Learn more about the VFC program at [www.cdc.gov/Features/VFCprogram](http://www.cdc.gov/Features/VFCprogram).

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## Related Resources

Petrosky E, Bocchini JA, Jr., Hariri S, Chesson H, Curtis CR, Saraiya M, et al. [Use of 9-valent human papillomavirus \(HPV\) vaccine: updated HPV vaccination recommendations of the advisory committee on immunization practices](#). MMWR Morb Mortal Wkly Rep. 2015 Mar 27;64(11):300-4. 304. [Print version](#) [24 pages]

Markowitz LE, Dunne EF, Saraiya M, Chesson HW, Curtis CR, Gee J, Bocchini JA Jr, Unger ER. Human papillomavirus vaccination: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2014;63(RR-05):1-30.

Food and Drug Administration. Prescribing information [Package insert]. Gardasil 9 [Human Papillomavirus 9-valent Vaccine, Recombinant], Merck & Co., Inc. Silver Spring, MD: U.S. Department of Health and Human Services, Food and Drug Administration; 2016; Available from: <http://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM426457.pdf>.

Meites E, Kempe A, Markowitz LE. Use of a 2-Dose Schedule for Human Papillomavirus Vaccination — Updated Recommendations of the Advisory Committee on Immunization Practices. MMWR Morb Mortal Wkly Rep 2016;65: 1405–1408. <http://dx.doi.org/10.15585/mmwr.mm6549a5>.