

Preventive medicine series: The HPV vaccine

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The human papillomavirus (HPV) is a sexually transmitted pathogen that causes anogenital cancer and genital warts in both males and females. The HPV vaccines have shown to be effective in preventing cervical cancer and other disease.

Persistent viral infection with certain types of HPV causes virtually all cancers of the cervix as well as most cases of anal cancer and a large proportion of oropharyngeal cancer in men and women, vulvar and vaginal cancer, and penile cancer (1).



Cervical cancer is the third most common female cancer worldwide (2). This type of cancer has a mortality rate of 52 percent and new cases of cervical cancer per year have reached over half a million (3).

Although still a relatively uncommon cancer, the incidence of anal cancer is increasing throughout the United States (4). The human papillomavirus causes approximately 88 percent of anal cancers (1).

Genital warts are also a result of the virus. These unsightly lesions are the most common sexually transmitted disease in the U.S. Individuals with genital warts are at an increased risk for cancers of the anogenital tract as well as of the head and neck.

There are currently three brands of HPV vaccine available on the market today: Gardasil, Gardasil 9, and Cervarix. They differ in the types of HPV they target, although each one of them provides immunity to the type that most often causes cervical cancer.

The Gardasil vaccines also target the virus types that cause genital warts and the most common ones that can lead to other anogenital cancers such as anal and penile cancer.

Each of the vaccines has been proven, with large-scale double blinded clinical trials, to prevent cervical disease and cancer. The Gardasil also has proven efficacy against genital warts.

For patients who haven't already been exposed to HPV, the Gardasil vaccine, specifically, has shown to be 97-100 percent effective in preventing cervical neoplasm (cancer).

The United States Advisory Committee on Immunization Practices (ACIP) and the American Cancer Society recommend that female patients receive the vaccine around ages 11-12, but it can be as early as nine and as late as age 26.

They also recommend the Gardasil vaccine to male patients aged 11 or 12, but also can begin at nine.

Although the HPV vaccine is more effective in those not already exposed to the virus (prior to the onset of sexual activity), there is still large benefit from receiving it even after one's sexual debut. Even if a patient has a history of an abnormal pap smear or history of warts, the vaccine is still recommended.

The vaccine is a series of three doses over a six-month time period. Like most vaccines, the HPV vaccines are made up of virus-like particles which mimic the virus to create an immune response. It is not a live vaccine. There are very limited side effects, usually local injection site irritation, headache, nausea, and generalized weakness, each of which is short-lived and wears off quickly.

There was concern among parents about the behavioral impact on behalf of adolescent girls after receiving this vaccine. However, studies have shown that there was no increase in risky sexual behavior in this vaccinated population (5).

With three doses, the HPV vaccine is a very effective method in reducing the risk of cervical, anal, oropharyngeal, penile, and vulvar and vaginal cancers, along with genital warts. With this preventive method, the miseries and death rates from these diseases are drastically diminished.

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The health information provided herein is not intended to replace the advice or discussion with a healthcare provider and is for educational purposes only. Before making any decisions regarding your health, speak with your healthcare provider

1. [Forman D, de Martel C, Lacey CJ, et al. Global burden of human papillomavirus and related diseases. Vaccine 2012; 30 Suppl 5:F12.](#)
2. Globocan 2012: Estimated cancer incidence, mortality and prevalence worldwide in 2012. <http://globocan.iarc.fr/Default.aspx>.
3. WHO/ICO Information Center of HPV and Cervical Cancer (HPV Information Center). Human Papillomavirus and Related Cancers in the World. Summary Report 2010. <http://www.who.int/hpvcentre/en/>.
4. [Johnson LG, Madeleine MM, Newcomer LM, et al. Anal cancer incidence and survival: the surveillance, epidemiology, and end results experience, 1973-2000. Cancer 2004; 101:281.](#)
5. [Bednarczyk RA, Davis R, Ault K, et al. Sexual activity-related outcomes after human papillomavirus vaccination of 11- to 12-year-olds. Pediatrics 2012; 130:798.](#)