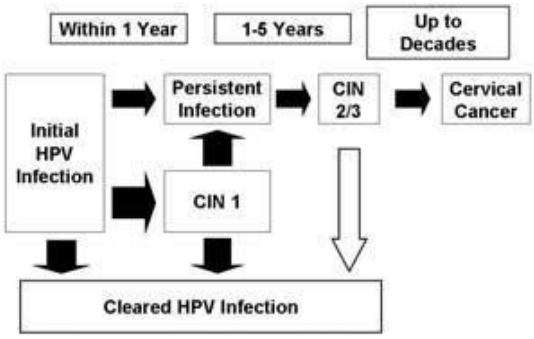
American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™
Maryland Chapter

The HPV Series: The Human Papillomavirus (HPV) and Cervical Cancer
Issue 3: April 7, 2014

Through funding support from The Department of Health and Mental Health (DHMH) it is our pleasure to share with you a series dedicated to the HPV vaccine in the pediatric setting. Each issue will present a literature review for the provider with questions and answers on key issues for parents and caretakers. The AAP and CDC have both recommended vaccination starting at eleven to twelve years of age for both boys and girls; however, the vaccine still remains poorly utilized.[1]

Last issue focused on human papillomavirus strains and the demographics of infection. This issue will focus on the pathophysiology of conversion from HPV infection to cervical cancer.



The HPV vaccination protects against multiple mucosal cancers including oropharyngeal cancers and other anogenital cancers, and yet it is still most commonly described as protection against cervical cancer. The human papillomavirus is considered to be necessary, but not sufficient, to cause cervical cancers and is found in 99% of all cervical cancers. (1) Persistent infection predisposes to Grade 1 Cervical Intra-Epithelial Neoplasm (CIN). Over a period of years early CIN may clear spontaneously or progress to higher grades of cytology. HPV strains are often classified by their oncogenic risk.

The high risk strains are types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68, 69, 73, and 82. Out of these numerous strains only 2, 16 and 18, account for 70% of all cervical cancer which was why they were chosen for inclusion into the HPV vaccine. Of persons infected 5%-30% are infected with multiple strains. (2) Infections with one type does not protect against infections with other types, and it has been shown that infection with 16 may increase risk factor of infection with additional types. (3)

All female patients are still advised to have regular pap smears regardless of vaccination status due to the remaining 30% of high risk types still circulating. Recommendations have however recently changed concerning the timing and frequency of pap smears. Both ACOG and the USPTF now recommend pap smears starting at age 21 instead of 18. For patients between the age of 30 and 65 “co-testing” with both cytology and HPV can be performed, and if both are negative, testing need only be repeated every 5 years instead of every 3. In addition, for patients older than 65 years with adequate and negative testing for greater than 20 years, pap smears can be permanently discontinued. (4)

HPV vaccination is still expected to decrease the number of lifetime pap smears. A 2014 study of the HPV vaccine was shown to reduce the number of both low and high grade abnormalities found on pap smears by 36% and 54% respectively. Since HPV vaccine was shown to be effective at decreasing concerning cytology, this would reduce the need for follow up pap smears and also significantly decrease anxiety for individuals affected. (5)

[1] The Author: Theodore Wilson MD is working with the Maryland AAP chapter. He has no financial conflicts of interest or investments in any products discussed.

This can be printed as a hand-out for parents to answer their questions.

<u>The HPV Series:</u> Family questions about HPV and Cervical Cancer

Can a vaccine really prevent cancer?

Yes, Human papilloma virus is found in all cervical cancers. The HPV virus causes cells to quickly grow and those cells are thought to be the beginning of cervical cancer.

Does the vaccine offer complete protection?

No, the vaccine currently only protects against the two most common strains that may cause cancer; however, these two strains are expected to contribute to 70% of cervical cancer which is a dramatic reduction.

I heard that there has never really been a study proving that the HPV vaccine saves lives. Is that true?

This is true! It takes decades between when an individual acquires the HPV virus and when they are diagnosed with cancer. Any study would need to take at least that long to prove the benefit of the HPV vaccine. It has been shown that HPV vaccine stops HPV, that HPV is required for cervical cancer, and that vaccine stops cervical abnormalities.

If this protects against cervical cancer do I still need to see a gynecologist every year?

Yes, a trained gynecologist covers many areas of female health apart from cervical cancer. All women still need pap smears between the ages of 21 and 65. Those who test negative for HPV may have a pap smear every 5 years instead of every 3.

Would I be protected from cervical cancer if I were to only receive one dose of the HPV series?

Not really, the first dose does provide some protection against cervical cancer, but a 2014 study showed that is only 20% as effective as the three shot series at preventing abnormal pap smears.

References:

1) CDC MMWR: "Quadrivalent Human Papillomavirus vaccine" March 12, 2007 / 56(Early Release);1-24 http://www.cdc.gov/mmwr/preview/mmwrhtml/rr56e312a1.htm

2) CDC Pink Book "Human Papillomavirus Epidemiology and Prevention of Vaccine-Preventable Diseases" The Pink Book: - 12th Edition Second Printing (May 2012) (Additionally, source of image 1 CDC Public Domain) http://www.cdc.gov/vaccines/pubs/pinkbook/hpv.html

3) Liaw et al. "A Prospective Study of Human Papillomavirus Type 16 DNA Detection and Its Association with Acquisition and Persistence of Other HPV Types" The Journal of Infectious Diseases 2001; 183:8-15 http://jid.oxfordjournals.org/content/183/1/8.full.pdf

4) ACOG Cervical Cancer Screening Guidelines: https://www.acog.org/About_ACOG/Announcements/New_Cervical_Cancer_Screening_Recommendations

5) "Effectiveness of quadrivalent human papillomavirus vaccine for the prevention of cervical abnormalities: case-control study nested within a population based screening programme in Australia" BMJ 2014;348:g1458 http://www.bmj.com/cgi/doi/10.1136/bmj.g1458