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Issue Brief for Health Care Providers: Vaccination to Prevent HPV-Associated Diseases

Human papillomavirus (HPV) is associated with cervical, vulvar, and vaginal cancer in females, penile cancer in males, and anal cancer, oropharyngeal cancer and genital warts in both females and males. Most sexually-active men and women will get at least one type of HPV at some point in their lives. Although the majority of HPV infections are asymptomatic and resolve without sequelae, each year in the US, HPV causes about 23,300 cancers in women and 16,500 cases of cancer in men.¹

The majority of HPV infections causing cancers and genital warts can be prevented through vaccination. 9vHPV (Gardasil 9) was licensed in 2014 for both females and males, and is the only vaccine currently distributed in the United States. 9vHPV is an inactivated vaccine that protects against 7 cancer-causing HPV strains (16, 18, 31, 33, 45, 52 and 58) and 2 HPV strains that cause genital warts (6 and 11). Bivalent Cervarix (2vHPV) and quadrivalent Gardasil (4vHPV) vaccines are no longer available in the U.S.²

Younger adolescents only need 2 doses of HPV vaccine to mount a strong immune response. The HPV vaccine series is licensed for adolescents and young adults ages 9 to 45 years,* and routinely recommended for adolescents aged 11 to 12 years. Studies have shown that two doses of HPV vaccine given 6–12 months apart to adolescents from age 9 to 14 years worked as well or better than three doses given to older adolescents and young adults.³ Therefore, ACIP recommends a 2-dose HPV vaccine schedule for adolescents who start the vaccination series before the 15th birthday. The series should be administered as follows:

Age When <i>Initiating</i> Series	# Doses Required	Schedule	Minimum Interval
<ul style="list-style-type: none">• 9–14 years	2	0, 6–12 months	5 months
<ul style="list-style-type: none">• 15–21 years (heterosexual males)• 15–26 years (females, men who have sex with men, and transgender individuals)• 9–26 years (immunocompromised and/or HIV-positive individuals)	3	0, 1–2, and 6 months	4 weeks between 1 st and 2 nd dose 12 weeks between 2 nd and 3 rd dose 5 months between 1 st and 3 rd dose

If the vaccination series is interrupted, it does not need to be restarted. Patients who started the series with one HPV vaccine may continue or complete the series with another HPV vaccine that is also recommended for that patient. There is no ACIP recommendation for patients who completed the 3-dose HPV series with 2vHPV or 4vHPV to receive one or more doses of 9vHPV.

* Although HPV vaccine is licensed for adults up to age 45, ACIP has not yet recommended HPV vaccination for adults over age 26.

¹ <https://www.cdc.gov/cancer/hpv/statistics/index.htm>

HPV vaccines are highly immunogenic and effective

- A 2016 study demonstrated that within 6 years of vaccine introduction, there were decreases in national vaccine type HPV prevalence of 64% and 34% among females aged 14 to 19 years and 20 to 24 years, respectively.⁴
- A 2014 effectiveness study showed that clinically-effective vaccine-induced antibody response persisted 8 years after vaccination.⁵
- A 2015 Canadian study found that cervical dysplasia incidence rates were significantly reduced following implementation of an HPV vaccination program.⁶
- A 2017 study found that adolescent and teenage girls who received 2 or 3 doses of HPV vaccine were significantly less likely to experience genital warts than those who had received 1 or no doses.⁷
- A cross-sectional study following implementation of the Australian HPV vaccination program showed a substantial decline in vaccine-targeted HPV types in vaccinated women, reduced prevalence of vaccine-targeted HPV types in unvaccinated women, and possible indication of cross-protection against HPV types related to vaccine-targeted ones in vaccinated women.⁸

HPV vaccines are safe

- More than 90 million doses of HPV vaccine have been distributed in the U.S. between 2006 and 2016.
- The most common adverse reactions following HPV vaccination include injection-site reactions such as soreness, redness or swelling, as well as dizziness, nausea, and headache.⁹
- Almost all vaccines are associated with syncope, which is most frequently reported following vaccination with Tdap, MCV4 and HPV – vaccines commonly administered during adolescence. Research is ongoing to determine whether these vaccines have a greater association with syncope compared to other vaccines, or whether their frequency is increased because adolescents are more likely to experience syncope.
- Providers should take steps to reduce syncope and prevent fall-related injuries by having their patients seated or lying down during vaccination, and by observing patients for 15 minutes following vaccination.

HPV vaccination does not result in earlier initiation of or increased sexual activity

- A 2015 study assessing the effect of HPV vaccination on clinical indicators of sexual activity among adolescent girls found no significant difference in pregnancy rates or non-HPV sexually transmitted infection rates in two population-based cohorts before and after implementation of an HPV vaccination program.⁶
- A 2013 Pediatrics study found that risk perceptions after HPV vaccination were not associated with riskier sexual behavior.¹⁰
- A 2012 study found that HPV vaccination was not associated with an increase sexual activity-related outcome rates.¹¹

A healthcare provider's strong HPV vaccination recommendation is critical to a parent's decision to have their child vaccinated.

- The CDC's 2016 National Immunization Survey-Teen (NIS-Teen) found that 49.5% of females and 37.5% of males aged 13–17 years in the U.S. were up-to-date with the recommended HPV vaccination series, whereas 87.6% of adolescents aged 13–17 years had received the recommended one dose of Tdap.¹²

- Discrepancies in coverage rates for routinely recommended adolescent vaccines point toward missed opportunities and the need for parent and provider education.
- The most frequently reported reasons parents chose not to vaccinate their child include a lack of parental knowledge, that the vaccine was not recommended, a belief that the vaccine is not needed or necessary, concerns about vaccine safety and side effects, and that their child is not sexually active.⁶ Parent barriers include lack of information, concern about impact on sexual behavior, and perceived risk of infection.¹³
- A 2016 study observed that assuming a family's readiness to vaccinate by using presumptive "announcements" is more effective than participatory "conversations."¹⁴

To improve HPV vaccination rates, providers should:

- **Strongly recommend HPV the same way and on the same day as Tdap and MCV4 at the 11–12 year old well visit. Try stating, “(Child’s name) is 11-years-old. That means s/he is due for three vaccines today: Meningococcal conjugate to prevent meningitis, HPV vaccine to prevent some types of cancer, and Tdap to prevent whooping cough. Do you have any questions?”**
- **Emphasize HPV vaccination as cancer prevention.**
- **Educate that HPV vaccine is safe and that side-effects tend to be minor.**
- **Emphasize that fewer doses are required and the immune response is stronger when the series is started before age 15.**
- **Consider routinely initiating the HPV vaccine series at age 9. Patients who receive their first dose at age 9 can complete the 2-dose series at their 11–12 year-old well visit.**
- **Address concerns that HPV vaccination leads to increased or earlier sexual activity.**
- **Schedule appointments for HPV #2 and HPV #3 when HPV #1 is given. Seattle area providers may also refer patients to school-based health centers (SBHCs) for doses #2 and #3*.**
- **Use reminder/recall strategies to bring unvaccinated or undervaccinated adolescents and young adults up-to-date.**
- **Continue recommending other cancer-prevention strategies such as routine pap smears, as HPV vaccine does not protect against all cancer-causing HPV strains.**

*For more information about referring patients to SBHCs for follow up doses, call the Immunization Program at 206-296-4774.

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RESOURCES

[HPV clinical resources for providers](#) (CDC)

[Resources and Education](#) (National HPV Vaccination Roundtable, American Cancer Society)

[Committee Opinion on HPV Vaccination](#) (The American Congress on Obstetricians and Gynecologists)

[HPV Vaccination Algorithm](#)

[Generating reminder/recall reports using immunization registry data](#) (Washington State Department of Health)