HPV Vaccine Education Toolkit for Providers:

An Approach for Endorsing HPV Vaccination in Children With Medical Complexity

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Learn more about the program: Emerging Leaders Program - National HPV Vaccination Roundtable

Introduction

Human papillomavirus (HPV) infection can cause oropharyngeal, cervical, anal, vulvar, penile, and vaginal cancers. The HPV vaccine protects against the virus types that cause most HPV-related cancers and genital warts.[1] Studies have reported an 88% reduction of risk of cervical cancers among women who received the HPV vaccine before the age 17.[2] HPV vaccination should begin at age 9, with the series completed by age 13, as the vaccine is most effective when administered before this age.[1] The American Cancer Society (ACS) recommends:

- Girls and boys should get 2 doses of the HPV vaccine between the ages of 9 and 12.
- Teens and young adults ages 13 through 26 who have not been vaccinated, or who have not gotten all their doses, should get the vaccine as soon as possible.
- ACS does not recommend HPV vaccination for people older than age 26 years.[3]

Two doses of HPV vaccine are recommended for persons starting the series before their 15th birthday. The second dose of HPV vaccine should be given 6-12 months after the first dose. Three doses of HPV vaccine are recommended for teens and young adults who start the series after their 15th birthday and for immunocompromised persons.[3] The three-dose schedule is 0, 1-2, and 6 months.[3]

Background

According to an American Academy of Pediatrics (AAP), children with medical complexity (CMC) are a subset of children and youth with special healthcare needs (CYSHCN). They have multiple significant chronic health problems, functional limitations, high healthcare and resource need, and/or utilization.[4] Although children with medical complexity represent < 1% of children in the United States, they account for more than one-third of total pediatric healthcare costs.[4] Efforts to improve their quality of healthcare, better support their families, and increase cost-effectiveness have been challenging.[4]

A recent study developed a consensus-based, standardized definition for CMC with criteria to fulfill four domains: diagnostic conditions, functional limitations, healthcare use, and family-identified needs.[5] For this special population group, a simplified definition of a child with medical complexity includes *all* of the following:

- A child with at least 2 or more medical diagnoses
- A child who is followed by 3 or more pediatric subspecialists
- A child with functional limitations requiring significant caregiving needs

HPV vaccination coverage among adolescents with complex medical conditions remains low.[6] However, evidence from clinical trials and post-licensure studies has not identified safety concerns in high-risk populations, and there are no contraindications to HPV vaccination based on underlying medical conditions.[7] Improving HPV vaccination rates is essential to enhancing the quality of care and cancer prevention for this population. Notably, many subspecialists do not routinely recommend HPV vaccination to adolescents with chronic medical conditions.[8]

Persistent HPV infection is more common among patients receiving immunosuppressive therapy, underscoring the importance of HPV vaccination in this population.[9] In a study of individuals aged 9-26 years with two or more systemic inflammatory diagnoses (SID), significantly fewer patients with SID had initiated HPV vaccination compared with those without such conditions.[9] Multiple factors contribute to reduced vaccine uptake in this group, including limited primary care provider awareness of the increased risk of cervical dysplasia and cancer in this population, lack of vaccine availability in subspecialty clinics where these patients often receive care, provider hesitancy to recommend non-mandatory vaccines to chronically ill children, and parental reluctance to pursue additional interventions.[9] As this cohort meets the definition of CMC, these findings may be generalizable to that population.

Parental perspective of HPV vaccination in CMC plays an important role in vaccine uptake. A study suggests that acceptability in parents of children with special health needs (CSHCN) is lower than in the general population.[10] This study raises awareness that healthcare providers need to be aware of the possibility that parents of CSHCN may not perceive their child as needing or being offered the HPV vaccine.[10] Another study that looked at barriers of HPV vaccination among adolescents with intellectual disabilities or autism found that trust in the vaccine was high, but knowledge of the HPV vaccine was limited, including lack of accessible information for parents and consent process.[11] Further research is needed in this area.

Providers should focus on efforts in improving HPV vaccine uptake in CMC to improve quality of care, reduce persistent HPV infection, and promote cancer prevention. Limited research on HPV vaccine uptake in CMC, lack of provider education and recommendation of HPV vaccination with CMC, and heightened vaccine hesitancy of parents of CMC indicates that more strategies are needed to improve HPV vaccination among CMC.

Summary of Strategies to Increase HPV Vaccination in CMC

1. Engage pediatric division leadership in HPV vaccination efforts, and endorse HPV vaccination starting at age.[9]
2. Create a pro-vaccination environment and expand opportunities for vaccination for children with medical complexity through pediatric subspecialists.[1]
3. Educate pediatric subspecialists and encourage pediatric subspecialists to make effective HPV vaccination recommendations.[12]
4. Use recommended and evidence-based strategies to answer parent questions about HPV vaccination.[12]
5. Evaluate pediatric subspecialist HPV vaccine education and HPV vaccination rates among CMC. Determine if further improvement in strategies is needed.

Action Plan

Action 1: Engage pediatric department leadership in HPV vaccination efforts, and endorse HPV vaccination starting at age 9.

- Start with a pediatric departmental policy to start HPV vaccination at age 9.
  - Resources:
    - American Cancer Society National HPV Vaccination Roundtable Call to Action Letter (see Appendix A)
- Communicate “Start at Age 9” policy to all pediatric providers including pediatric subspecialists.
- Determine baseline HPV vaccination rates in CMC ages 9-13 years, and share data with providers. Update electronic medical records as needed to include HPV vaccination status for patients 9 and older.

Action 2: Create a pro-vaccination environment, and expand opportunities for vaccination for children with medical complexity through pediatric subspecialists.

- Foster a pro-immunization culture by framing HPV vaccination as a cancer prevention strategy and clearly communicating its importance to pediatric subspecialty colleagues.[1]
    - Organize an HPV cancer survivor speaker or panel to inspire providers.
    - Emphasizing the need for dual recommendations by both pediatric subspecialists and primary care physicians.
    - Establish accountability partnerships between pediatric primary care providers and pediatric subspecialists to promote shared responsibility for HPV vaccination. Foster collaboration between clinicians who routinely advocate for immunizations and those with less experience in vaccine promotion.
- Determine if HPV vaccination can be given in pediatric subspecialty offices, and develop a workflow.
- If HPV vaccination cannot be given in pediatric subspecialty offices, then inform primary care providers that subspecialists recommend the patient receive the HPV vaccine. Encourage subspecialists to document recommendations.

Action 3: Educate and encourage pediatric subspecialists to make informed recommendations.

Step 1 - Educate pediatric subspecialists about HPV infection and HPV-related cancers.

- Review the literature and vaccination series administration.
- Review why the HPV vaccine is important – especially in children with medical complexity, and review the importance of a strong recommendation from a trusted pediatric provider.
- Address common vaccine misconceptions.[1]
- Repeat trainings or offer continuing education opportunities of health professionals.[1]

Step 2 - Encourage pediatric subspecialists to make effective HPV vaccination recommendations.

- Provide training to pediatric subspecialists on how to make effective recommendations that influence the following best practices:
    - Provider vaccination recommendation is powerful. Clinician recommendations are the No. 1 reason parents or guardians choose to vaccinate their children.[12]
    - The best predictor of vaccination uptake for both hesitant and non-hesitant parents is how the provider starts the conversation.
    - Make presumptive recommendations, which are brief statements that assume parents or guardians are ready to have their children vaccinated.[12]
        - Example: *"Your child is 9 years old and is due for their HPV vaccine today to help protect them against six types of cancers."*
    - Implement evidence-based training:
        - The Announcement Approach Training, which teaches healthcare professionals how to make and support strong HPV vaccine recommendations[13]
        - The 3 C's Intervention and Motivational Interviewing, which address vaccine hesitancy, foster trust, and explore vaccine concerns while providing education and knowledge[14]

Action 4: Use recommended and evidence-based strategies to answer questions about HPV vaccination.

- Educate pediatric subspecialists on recommended strategies to answer parents' questions that include the following best practices:
  - Understand the risk of vaccination and risks of not vaccinating: The benefit of cancer prevention outweighs any potential risks of an adverse event due to the vaccination. This is built into the vaccine approval process.[15]
  - Reframe parent fears:
    - Scared of "vaccine injury:" Discuss how the patient is more at risk of acquiring an HPV-related cancer and the importance of cancer prevention.[15]
    - Scared of the "unknowns" around HPV vaccination: Re-frame their thinking to fear the disease, not the vaccine.[15]
  - Address vaccine hesitancy:[16]
    - Ask for permission to share information about vaccines.
    - Discuss safety and efficacy of the HPV vaccine.
    - Offer credible vaccine resources for parents.

Action 5: Evaluate pediatric subspecialist HPV vaccine education and HPV vaccination rates among children with medical complexity.

- Analyze and improve strategies.
- Determine HPV vaccination rates among CMC given among pediatric subspecialists.
- Share data, give provider feedback, and re-evaluate areas for process change.
- Promote a culture of continued learning and improvement.
  - HPV 2nd dose vaccine reminders to parents[17]
  - Implementing standing orders for HPV vaccine[18]

Additional Resources

- American Cancer Society HPV Information
- American Cancer Society HPV Information and Resources for Parents and Patients
- HPV Vaccination at age 9-12 Years of Age
- ACS National HPV Roundtable Resource Center
- AAP How Pediatricians Can Recommend HPV Vaccination to Parents and Caregivers
- ACS National HPV Vaccination Roundtable Call to Action Letter



References

1. American Cancer Society. (2024a). *Cancer Prevention through HPV vaccination: An action guide for large health systems*. https://hpvroundtable.org/wp-content/uploads/2024/10/Cancer-Prevention-Through-HPV-Vaccination-An-Action-Guide-for-Large-Health-Systems.pdf.
2. Lei, J., Ploner, A., Elfström, K. M., Wang, J., Roth, A., Fang, F., Sundström, K., Dillner, J., & Sparén, P. (2020). HPV vaccination and the risk of invasive cervical cancer. *N Engl J Med*, *383*(14), 1340–1348. https://doi.org/10.1056/nejmoa1917338.
3. Saslow D, Andrews KS, Manassaram-Baptiste D, Smith RA, Fontham ETH; American Cancer Society Guideline Development Group. Human papillomavirus vaccination 2020 guideline update: American Cancer Society guideline adaptation. *CA Cancer J Clin*. 2020;70(4):274-280. doi: 10.3322/caac.21616. Epub 2020 Jul 8. PMID: 32639044.
4. *Children with Medical Complexity.* (2022). https://www.aap.org/en/patient-care/children-with-medical-complexity/?srsltid=AfmBOopPKlM4Rt6QbyFNAtORuqfaxLcOCeH7oxQTwKL01fVHMKn1iOHl.
5. Millar, K., Rodd, C., Rempel, G., Cohen, E., Sibley, K. M., & Garland, A. (2024). The Clinical Definition of Children with Medical Complexity: a Modified Delphi study. *Pediatrics*, *153*(6). https://doi.org/10.1542/peds.2023-064556.
6. Hofstetter, A. M., LaRussa, P., & Rosenthal, S. L. (2015). Vaccination of adolescents with chronic medical conditions: Special considerations and strategies for enhancing uptake. *Hum Vaccin Immunother*, *11*(11), 2571–2581. https://doi.org/10.1080/21645515.2015.1067350.
7. Markowitz LE, Dunne EF, Saraiya M, Chesson HW, Curtis CR, Gee J, Bocchini JA Jr, Unger ER, Centers for Disease Control and Prevention (CDC). Human papillomavirus vaccination: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* Aug 29 2014; 63 (RR-05):1-30; PMID:25167164.
8. Hofstetter, A. M., Lappetito, L., Stockwell, M. S., & Rosenthal, S. L. (2016). Human Papillomavirus Vaccination of Adolescents with Chronic Medical Conditions: A National Survey of Pediatric Subspecialists. *J Pediatr Adolesc Gynecol*, *30*(1), 88-95. https://doi.org/10.1016/j.jpag.2016.08.005.
9. Feldman, C. H., Hiraki, L. T., Lii, H., Seeger, J. D., & Kim, S. C. (2015). Human Papillomavirus Vaccine Uptake among Individuals with Systemic Inflammatory Diseases. *PLoS One*, *10*(2), e0117620. https://doi.org/10.1371/journal.pone.0117620.
10. Cody, P. J., & Lerand, S. J. (2013). HPV Vaccination in Female Children with Special Health Care Needs. *J Pediatr Adolesct Gynecol*, *26*(4), 219-223. https://doi.org/10.1016/j.jpag.2013.03.003.
11. Tuckerman, J., Mohamed, Y., Justice, F., Andersson, T., Wyatt, K., Broun, K., Bastable, A., Overmars, I., Kaufman, J., & Danchin, M. (2024). Stakeholder perspectives of immunisation delivery for adolescents with disability in specialist schools in Victoria, Australia: 'we need a vaccination pathway.' *BMC Public Health*, *24*(1), 1973. https://doi.org/10.1186/s12889-024-19322-y.
12. American Cancer Society. (2024b). *Cancer Prevention Through HPV Vaccination: An Action Guide for Physicians, Physician Assistants/Physician Associates, and Advanced Practice Nurses*. https://hpvroundtable.org/wp-content/uploads/2024/10/Cancer-Prevention-Through-HPV-Vaccination-An-Action-Guide-for-Physicians-Physician-Assistants-Physician-Associates-and-Advanced-Practice-Nurs.pdf.
13. Brewer, E. Al., Shah, E. Al., & Kornides, E. Al. (2019). *The announcement approach for increasing HPV vaccination*. https://hpvroundtable.org/wp-content/uploads/2024/05/3-Flyer-required-AAT-2024-final.pdf.
14. Unity Consortium. (2023, April 18). *Three Cs demo and motivational interviewing - Unity Consortium*. https://www.unity4teenvax.org/resource/three-cs-demo-and-motivational-interviewing/.
15. *Understanding risk perception | Voices for Vaccines.* (2025, February 25). Voices for Vaccines. https://www.voicesforvaccines.org/toolkits/vaccine-hesitancy/understanding-risk-perception/.
16. *Common vaccine hesitancy issues | Voices for Vaccines.* (2025, February 25). Voices for Vaccines. https://www.voicesforvaccines.org/toolkits/vaccine-hesitancy/common-vaccine-hesitancy-issues/.
17. Saslow, D., Darville-Sanders, G., Turpin, C., Hora, L., National HPV Vaccination Roundtable, & WA HPV Free Taskforce. (n.d.). *Start at 9 Toolkit*. https://hpvroundtable.org/wp-content/uploads/2023/05/FINAL_NW-Summit-Clinic-Toolkit-Print-On-Demand-Kits.pdf.
18. Mansfield, L. N., Kahn, B. Z., Kokitkar, S., Kritikos, K. I., Brantz, S. N., & Brewer, N. T. (2024). HPV vaccine standing orders and communication in primary care: A qualitative study. *Vaccine*, *42*(19), 3981–3988. https://doi.org/10.1016/j.vaccine.2024.05.008.
19. Chandeying, N., & Thongseiratch, T. (2024). EMR-Based Interventions on HPV vaccination initiation, completion, and receiving the next dose: A Meta-Analytic Review. *Vaccines*, *12*(7), 739. https://doi.org/10.3390/vaccines12070739.