2021 Human Papillomavirus (HPV) Vaccination Update

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Presenter Disclosure Information

• I, Rebecca Perkins, have been asked to disclose any significant relationships with commercial entities that are either providing financial support for this program or whose products or services are mentioned during our presentations.
  • I have no relationships to disclose.

• I may/will discuss the use of vaccines in a manner not approved by the U.S. Food and Drug Administration.
  • But in accordance with ACIP recommendations.
Objectives

• Summarize the Advisory Committee on Immunization Practices (ACIP) recommendations for human papillomavirus (HPV) vaccination.
• Review Massachusetts HPV vaccination uptake.
• Describe vaccination challenges as a result of the COVID-19 pandemic.
• Discuss strategies to get HPV vaccination “back on track.”
HPV Vaccination Can Prevent 6 Cancers


Slide courtesy of Melissa Gilkey
Cervical cancer prevention throughout the lifespan

- **Ages 9-20**
  - HPV vaccination

- **Ages 21-26**
  - Screening + catch-up vaccination

- **Ages 27-65**
  - Screening (HPV vaccination optional ages 27-45, but screening most important)
HPV infection occurs in young adulthood, cancers develop 10-30 years later.

- Genital HPV infection: 79 million
- Cervical Pre-cancer: 330,000
- Cervical Cancer: 12,000

Source: Schiffman M et al., 2013
Most HPV infections become undetectable in 1-3 years; those that persist cause precancer (CIN3+) over time.
Most HPV infections become undetectable in 1-3 years. Precancer and cancer increase markedly when infections persist for 5 years or more.
HPV cancer prevention has two phases

1) Vaccinating adolescents to prevent infections that can lead to cancer
2) Screening adults to detect and treat precancer before cancer develops
HPV vaccination: Current ACIP/AAP Recommendations

- HPV vaccine now *recommended* for everyone aged 9 through 26
- On-time vaccination is ages 9–12
- Catch-up vaccination ages 13-26
  - 2 doses 6-12 months apart ages 9-14
  - 3 doses at 0, 2, and 6 months ages 15+
- *Individual decision making* for individuals age 27-45 (not routinely recommended due to low benefit)
HPV Vaccination of Kids Eliminates HPV Infection and the Downstream Consequences

Source: Schiffman M et al., 2013
Vaccine Type-HPV Infections, US Females

Pre-Vaccine Era, Early Vaccine Era and Later Vaccine Era

Study also found vaccine type-HPV decreased 89% for vaccinated girls, 34% for unvaccinated girls: herd immunity

Dramatic decrease in cervical precancer ages 18-24 (pre-cancers increasing in older women who were not vaccinated)

Near elimination of cervical cancer before age 30

- Girls vaccinated before age 17 were 88% less likely to develop cervical cancer
- Cervical cancer screening began at age 23, so this reduction was in addition to screening
Is the HPV vaccine safe?

Yes!

Photo Credit: http://bit.ly/2Ewabb4
HPV Vaccine Long-term Safety Data

• No increase of
  – 2011- anaphylaxis, GBS, stroke, blood clots, appendicitis, or seizures (than unvaccinated or who received other vaccines)
  – 2013 –Blood clots or adverse events related to the immune system & central nervous system (almost 1 million girls)
  – 2014 – Venous thromboembolism or blood clots (>1 million women)
  – 2012 & 2014 – Autoimmune disorders
  – 2015 – Multiple sclerosis or other demyelinating diseases
  – 2018- Primary ovarian insufficiency, rheumatologic conditions

• And over 60 other conditions

Gee et al., 2016; Cameron et al, 2016; Chao et al., 2011; Suragh et al., 2018; Wise et al, 2018
What is the best way to prevent cervical cancer in adults?

- 13,800 cases annually (2020)
- 4,290 deaths annually (2020)


Cervical cancer incidence higher in rural counties and higher among Black and Hispanic women
Why does HPV vaccination work so much better in adolescents than adults?
Vaccination of kids happens before infection

Genital HPV infection 79 million

Cervical Pre-cancer 330,000

Cervical Cancer 12,000

Source: Schiffman M et al., 2013
Vaccination of adults happens after infection

Genital HPV infection
79 million

HPV infection
HSIL
Cervical Pre-cancer
330,000
Cervical Cancer
12,000

Source: Schiffman M et al., 2013
Shared clinical decision-making

- Shared clinical decision making category addresses situations where
  - vaccination may benefit some individuals, but
  - will have relatively minimal population-level impact

Identifying who may benefit from vaccination is not always straightforward.
Shared clinical decision-making for HPV vaccination of adults age 27 through 45 years

- HPV vaccination does not need to be discussed with most adults aged >26 years
- For adults aged 27 through 45 years who are not adequately vaccinated, clinicians can consider discussing HPV vaccination with persons who are most likely to benefit
- Ideally, vaccination should be given in early adolescence because vaccination is most effective before exposure to HPV through sexual activity

MMWR 2019; 68; 698-702
What do I do with my patient?

JAMA Clinical Guidelines Synopsis

Human Papillomavirus Vaccination for Adults
Updated Recommendations of the Advisory Committee on Immunization Practices (ACIP)

Lauren D. Oshman, MD, MPH; Andrew M. Davis, MD, MPH

Which persons older than 26 years should receive vaccination?
How should clinicians discuss this issue with patients potentially eligible for HPV vaccination in the 27- to 45-year age range?

“Persons who are in a long-term, mutually monogamous sexual partnership are not likely to acquire a new HPV infection or benefit from vaccination.”

Oshman & Davis, Jan 13, 2020, JAMA
“Individuals with multiple prior sex partners are likely to have been exposed to the vaccine serotypes in the past, reducing usefulness.”

Oshman & Davis, Jan 13, 2020, JAMA
“The vaccine may be more beneficial for persons who have had few prior sex partners and who are at greater risk of acquiring unencountered strains of HPV from new sex partners.”

Oshman & Davis, JAMA, 2020
Screening and treatment of precancers is the most effective cancer prevention for adults

Genital HPV infection
79 million

Source: Schiffman M et al., 2013
Current screening recommendations

• **Age 21-24**
  – Pap testing only every 3 years
  – HPV vaccination if not already vaccinated

• **Age 25-29**
  – Pap testing every 3 years or HPV testing every 5 years

• **Age 30-65**
  – HPV testing every 5 years
  – Pap/HPV cotesting every 5 years
  – Pap testing every 3 years

• **Age >65**
  – Discontinue screening if no prior abnormalities and 10 years of documented normal screening

USPSTF 2018; ACIP 2006, 2019; ACS 2020
Who is eligible for routine screening?

- **Abnormal uterine/vaginal bleeding?**
  - NO
  - **Hysterectomy that removed the cervix?**
    - NO
    - **HIV+ or immunosuppressed?**
      - NO
      - Abnormal test results within 10 years or treatment for precancer within the past 25 years?
        - NO
        - QUALIFIES FOR ROUTINE SCREENING
        - YES
        - Pap test part of diagnostic workup even if not due for screening
  - YES
  - Stop screening unless history of high grade precancer or cancer
  - YES
  - Screen per immunosuppression guidelines
  - YES
  - Follow ASCCP Risk-Based Management Consensus Guidelines

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How were we doing with HPV vaccination before COVID?
National adolescent vaccination coverage

- 80% Goal
- 72% ≥1 HPV
- 54% HPV UTD

Vaccination coverage over years for:
- ≥1 Tdap
- ≥1 MenACWY

% Vaccinated (ages 13-17)

Year

Elam-Evans, MMWR, 2020

Slide courtesy of Melissa Gilkey
Adolescent Vaccination Coverage with Tdap, MenACWY, and HPV, Massachusetts, NIS, 13-17 years, 2008 – 2019

Numbers in parentheses indicate percentage point change from the previous year.

*HPV Up to date (UTD): 2 doses if the first dose given before the 15th birthday and doses were separated by at least 5 months; otherwise, 3 doses

NIS Data, CDC
Key barriers to HPV vaccination

Provider recommendations
Parental hesitancy
COVID-19 pandemic
Provider recommendations are powerful

Adolescents who receive a provider recommendation have ~9x higher odds of receiving HPV vaccine
Provider recommendations need improvement

About half of physicians (51%) report using ≥2 lower-quality recommendation practices:

• Late recommendations for boys or girls
• Moderate or lower endorsement
• Risk-based recommendations
• Not recommending same-day vaccination

Gilkey et al., 2015, Cancer Epidemiol Biomarkers Prev

Slide courtesy of Melissa Gilkey
Parents’ reasons for HPV vaccine hesitancy are diverse

- Not needed/necessary
- Not recommended
- Lack of knowledge
- Not sexually active
- Safety / Side effects
- Child is male

Hanson KE et al., 2018, Clinical Infect Diseases

Slide courtesy of Melissa Gilkey
COVID-19 is challenging HPV vaccine delivery

- Dramatic short-term declines in HPV vaccine ordering/administration

Gilkey et al, 2020, Journal of Adolescent Health

Slide courtesy of Melissa Gilkey
HPV vaccine ordering in the U.S.

Elam-Evans et al., 2020, MMWR

Slide courtesy of Melissa Gilkey
COVID-19 is challenging HPV vaccine delivery

- Dramatic short-term declines in HPV vaccine ordering/administration
- Longer-term declines in the volume of preventive care visits
- Reduced focus on HPV vaccine QI

Gilkey et al, 2020, Journal of Adolescent Health
COVID-19 is challenging HPV vaccine acceptance

- Fewer prompts for “back-to-school” care
- Parents may have new reasons for HPV vaccine hesitancy, such as fear of COVID-19 exposure during office visits or vaccine cost

Gilkey et al, 2020, Journal of Adolescent Health

Slide courtesy of Melissa Gilkey
Getting HPV vaccination back on track
Getting HPV vaccination back on track

1. Improve provider recommendations
2. Use reminder/recall and address parents’ concerns
3. Offer vaccine-only visits
4. Multi-level interventions can be effective
Use clear unambiguous recommendations

Note child’s age.

Announce children this age are due for vaccines that prevent several diseases.

Say you will vaccinate today.

Now that Sophia is 11, she’s due for 3 vaccines to protect against meningitis, HPV cancers, and pertussis. We’ll give them at the end of the visit. Do you have any questions?
3-arm RCT in 30 NC primary care clinics

Announcement approach training

- A 5% point increase in HPV vaccine initiation by 3 months.

Brewer, et al., 2017, *Pediatrics*
Use patient reminder/recall

• Describe how your clinic is preventing COVID-19 exposure
• Note that HPV vaccine is available at no cost
Offer vaccine-only visits

- Concomitant vaccination
- Vaccination and telehealth
Other ways to improve recommendations

• Start early at ages 9-10
• Emphasize cancer prevention
• Unify the care team
• Keep trying
Parents who initially declined HPV vaccination (n=494)

- Almost half (45%) reported getting HPV vaccine at a later visit
- Another 24% planned to in the next year
- Secondary acceptance was more common among parents who got follow-up counseling

Kornides, et al., 2018, *Academic Pediatrics*
Multi-level interventions including provider training can produce larger, sustained effects
Dissemination and Implementation trial of DOSE-HPV

5 practices serving low-income and minority populations

Stepped wedge design implemented 2016-2018

Compared vaccination rates in pre-intervention, intervention, and post-intervention periods using random effects generalized linear regression models with clustering of patients within providers and clinics

Primary outcomes:
- likelihood that an eligible child visiting the clinic receives vaccination
- cumulative effect on population-level vaccine initiation and completion rates
Sustained increased likelihood of vaccination at eligible visit
Continuing increase in population prevalence of vaccine initiation over time

Impact of Intervention on Prevalence (%) of HPV Vaccination Initiation Over Time

<table>
<thead>
<tr>
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<th>% of All Eligible Visits (+/- 95% CI)</th>
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<tbody>
<tr>
<td><strong>pre 9 to 18</strong></td>
<td>70% ± 5%</td>
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<tr>
<td><strong>inter 9 to 18</strong></td>
<td>80% ± 5%</td>
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<td><strong>post 9 to 18</strong></td>
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</tr>
</tbody>
</table>
Continuing increase in population prevalence of vaccine completion over time

Impact of Intervention on Prevalence (%) of HPV Vaccination Completion Over Time

% of All Eligible Visits (+/− 95% CI)

- pre
- inter
- post

Definition 1

Adolescent Patients as an Urban Safety Net Healthcare System

Definition 2
Potential for dissemination and implementation

• Collaboration with ACS Vaccinate Adolescents against Cancers (VACs) program
  – Additional work with FQHC networks
• **12 FQHCs Systems** began Fall 2016-Dec. 2017
  45 clinic intervention sites
  • Focus on preteens turning 13 in measurement year (n=3283)
• Pilot **Quality Improvement Interventions**
  • Focus on **structured quality improvement**
  • Providers receive **Maintenance of Certification Part IV** and 20 Performance Improvement CME Credits
Steps for Increasing HPV Vaccination in Practice: An Action Guide to Implement Evidence-based Strategies for Clinicians


- Toolkit
- Road map
- Portal to resources
- Launched June 2015
- Tested and improved by 30 FQHC Pilots
Average Adolescent Vaccination Rates at MOC Pilot Systems, 2016 to 2017

- Initiation Increase: 23%
- Completion Increase: 21%

HPV Initiation, Tdap, and MCV4 among all 12 MOC Pilot systems, implementing the intervention in 45 clinic sites.

HPV Completion among 10 MOC Pilot systems with complete data.
Provider Feedback (n=45)

- 91% of learners made changes in practice:
  - Initiating vaccination at younger ages (starting at age 9 or 10)
  - Changing verbal presentation of vaccine (framed in terms of cancer prevention, bundled recommendation, not differentiating the vaccine, i.e. “due for all routine vaccinations”)
  - Strong recommendation at sick and wellness visits
  - Implementing standing orders
  - Implementing reminder/recall systems
Conclusions
Conclusions

• We’ve made great strides in increasing HPV vaccine coverage

• COVID-19 threatens to wipe out recent gains

• We must support primary care providers in recommending and administering HPV vaccine to get coverage back on track
Thank you!
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The VACs team

Photo credit:
https://www.flickr.com/photos/travelinlibrarian/223839049