HPV 101: You are the Key to HPV Cancer Prevention

Understanding the Burden of HPV Disease and the Importance of the HPV Vaccine Recommendation

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Professor of Pediatrics – Drexel University
Objectives

- Review HPV infection and clinical manifestations
- Understand HPV vaccine efficacy, safety, and guidelines
- Address challenges to implementing recommendations
  - Strategies for improving vaccine completion
  - Facts to help parents/adolescents make informed decisions
  - Key messages that influence health-related decisions
No disclosures pertinent to this presentation.
Adolescent HPV Immunization Campaign

- Collaborative effort between the CDC and PDPH to increase HPV vaccination rates in Philadelphia
  
  Project Goals:
  - ≥10% increase in 1\textsuperscript{st} dose uptake for males and females
  - ≥20% increase in 3\textsuperscript{rd} dose completion for males and females
  - ≥20% increase in initiation rates amongst 11-12 year olds

- Philadelphia has high initiation rates but low completion rates compared to national average
  - Completion rates decline most among African American and Latino adolescents

(Philadelphia Department of Public Health [PDPH], 2013a)
HPVV and Other Adolescent Vaccine Uptake and Completion for Adolescents (13-17 yrs) in the US and Philadelphia, 2008-2012

Healthy People 2020 Goal

Percent UTD

Females
Males

US ≤ 1 HPVV
PHL ≤ 1 HPVV
US ≤ 3 HPVV
PHL ≤ 3 HPVV
PHL 2012

(PDPH, 2013b)
HPV Infection

Understanding the Burden and the Virus
• A 21 year old woman in your program tells you that she had a test at a clinic that showed that she has HPV. You feel confident in telling her:

  • A) Most of the HPV types don’t lead to cancer, so she is probably okay
  • B) She no longer needs to get HPV testing now that she has tested positive once
  • C) A and B
  • D) She should continue close contact with her provider, including having further testing
HPV Testing

- Historically, the Pap smear as the only test = cytology
  - Looks for the presence of abnormal cells
    - The “footprint” of HPV
    - Suggestion that cells have undergone change from HPV that may lead to cancer

- HPV DNA Testing
  - Detection of presence of HPV from cervical sampling
Cervical Cancer Screening Guidelines

- Age 21: Start with cytology (e.g. Pap)
  - Unless immunocompromised (including HIV) or the presence of a suspicious lesion then start earlier
- 21-29 years: Screen every 3 years with cytology
  - Unless there is an abnormal Pap
- 30-65 years: Screen every 5 years with cytology plus HPV DNA test
  - Stop screening after hysterectomy if all tests have been negative

Abnormal tests need to be followed up with further testing, including possible colposcopy
How does HPV infection lead to cancer?

- HPV moves into the cell
- HPV takes over the cell to turn it into an HPV factory
- The cell is unable to regulate itself anymore and becomes malignant
How does HPV infection lead to cancer?

- Infection of the basal membrane
- Early Transformation of cells
- Malignant Transformation of cells

90% spontaneously clear in 12-18 months
May spontaneously resolve
Cellular point of no return (decades later)
By the numbers:

- 120 types of HPV with 40 types sexually transmitted
- 2 genital types
  - High risk for cancer, types 16 and 18
  - Low risk for cancer (but genital wart producing): 6 and 11
- 26,000 attributable cancers per year in the US (predominantly from 16/18)
- #1 sexually transmitted infection
A 21 year old woman in your program tells you that she had a test at a clinic that showed that she has HPV. You feel confident in telling her:

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- C) A and B
- D) **She should continue close contact with her provider, including having further testing**
Clinical Manifestations & Outcomes

Clinical Presentation and Epidemiology
HPV-Associated Cancers in Females

National Cancer Registry Data, 2004-2008

- Philadelphia women disproportionately:
  - Are diagnosed with cervical cancer (by >40%)
  - Die from cervical cancer (by >130%)

(CDC, 2013d)
HPV-Associated Cancers in Males

National Cancer Registry Data, 2004-2008

Men:
Anal cancer rates increasing by 2.7%
Oropharyngeal cancer rates by 225%

Average number of cases per year
HPV attributable

<table>
<thead>
<tr>
<th>Location</th>
<th>Average Number</th>
<th>HPV Attributable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anus</td>
<td>1,687</td>
<td>1,500</td>
</tr>
<tr>
<td>Oropharynx</td>
<td>9,312</td>
<td>6,700</td>
</tr>
<tr>
<td>Penis</td>
<td>1,003</td>
<td>600</td>
</tr>
</tbody>
</table>

(CDC, 2013d)
Transmission occurs by any intimate contact
- Does not require intercourse and condoms are not 100% protective

Tends to occur at time of sexual debut
- which for Philadelphia youth occurs early and often

Youth Risk Behavior Survey, 2011

<table>
<thead>
<tr>
<th></th>
<th>Philadelphia</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ever sexually active</td>
<td>61%</td>
<td>47.4%</td>
</tr>
<tr>
<td>Had sex before 13</td>
<td>15.1%</td>
<td>6.2%</td>
</tr>
<tr>
<td>Had sex with 4+ people</td>
<td>27.2%</td>
<td>15.3%</td>
</tr>
</tbody>
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(CDC, 2011; Brown & Winer [as cited in Feemster, 2013])
Sexually Transmitted Infections

STIs in persons 18 years and younger: Philadelphia, 2012

Zip code labels are the last 1-2 digits of the five number zip code starting ‘191’

STI rates (per 1,000 persons 13-18 yrs)
- 7 - 25.0
- 25.1 - 50.0
- 50.1 - 75.0
- 75.1 - 100.0
- 100.1 - 118.7

*19112 has no STIs

(PDPH, 2013c)
You notice that a 4 year old boy in pre-school is hoarse and has trouble breathing when he is playing hard. You guess that he has asthma and ask his mother if he has an inhaler. She looks nervous, tells you no, and whisks him away. The underlying infectious disease etiology that is currently preventable is:

- A) Meningococcus
- B) Human papillomavirus
- C) Group A Streptococcus
- D) Respiratory Syncytial Virus
Pediatric Recurrent Respiratory Papillomatosis (RRP)

- Genital warts in the respiratory tract
- From HPV 6 and 11 (mostly)
- 4.3/100,000
- Presents with hoarse cry, noisy breathing and may impact on feeding
- Diagnosed by laryngoscopy
- Treated with excision, with likely recurrence

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- C) Group A Streptococcus
- D) Respiratory Syncytial Virus
Genital Warts

- 1 in 10 individuals will develop genital warts in their lifetime

- Over 300,000 new cases a year in the US

  Every year, 5-6% of patients who visit the Philadelphia Department of Public Health STD Clinic are diagnosed with HPV or genital warts

- High recurrence rate after treatment

- Easily spread, even when asymptomatic

- Can cause pain, discomfort, anxiety, and depression

(Feemster, 2013)
Range of Visibility:
HPV Vaccine

Recommendations, Safety, Impact, & Coverage Rates
Your best friend calls on the phone and is frantic. Her sister was recently diagnosed with cervical cancer. After having refused HPV vaccine for her children previously, she now wants her entire family immunized as soon as possible. Which of her children are eligible for vaccine? (Choose as many as are eligible)

- A) 15 year old daughter
- B) 8 year old son
- C) 23 year old nephew
- D) 27 year old sister-in-law
- E) 22 year old son receiving chemotherapy for leukemia
ACIP Recommendation and AAP Guidelines for HPV Vaccine

- Routine HPV vaccination recommended for both males and females ages 11-12 years
- Catch-up ages 13-21 years for males; 13-26 years for females
- Immunocompromised persons and MSM should be vaccinated through age 26
- Permissive use ages 9-10 years for both males and females; 22-26 years for males
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# HPV Vaccine

<table>
<thead>
<tr>
<th>Quadrivalent/HPV4 (Gardasil)</th>
<th>Name</th>
<th>Bivalent/HPV2 (Cervarix)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Merck</strong></td>
<td><strong>Manufacturer</strong></td>
<td>GlaxoSmithKline</td>
</tr>
<tr>
<td>6, 11, 16, 18</td>
<td><strong>Types</strong></td>
<td>16, 18</td>
</tr>
<tr>
<td><strong>Females:</strong> Anal, cervical, vaginal and vulvar precancer and cancer; Genital warts</td>
<td><strong>Indications</strong></td>
<td><strong>Females:</strong> Cervical precancer and cancer <strong>Males:</strong> Not approved for use in males</td>
</tr>
<tr>
<td><strong>Males:</strong> Anal precancer and cancer; Genital warts</td>
<td><strong>Contraindications</strong></td>
<td>Pregnancy Hypersensitivity to latex (latex only contained in pre-filled syringes, not single-dose vials)</td>
</tr>
<tr>
<td>Pregnancy</td>
<td></td>
<td>3 dose series: 0, 1, 6 months</td>
</tr>
<tr>
<td>Hypersensitivity to yeast</td>
<td><strong>Schedule (IM)</strong></td>
<td>3 dose series: 0, 1, 6 months</td>
</tr>
</tbody>
</table>
Top 4 Reasons We Should Immunize Young:

1. Higher immune responses under 15 years
   - 9-15 year olds have 2x antibody response than 16-26 year olds

2. Protect vulnerable epithelium

3. Give BEFORE initiating sexual behavior

4. Give with other vaccines for convenience and opportunity
Top 4 Reasons Immunization Doesn’t Happen

1. Nobody recommended it
2. FEAR
   - Someone who is generally against vaccines
   - Someone who is specifically against HPV
3. Concern that it may encourage sexual activity
4. Lack of Knowledge
   - About prevalence of HPV
   - Of link between HPV and Cancer
5. Deferring to Later
A 17 year old girl presents for school entry. She received her first dose of HPVV at 13 years and 1 month later received the second dose. She hasn’t been back to your office since then, but now wants to get up to date with immunizations. You should tell her that her provider will likely:

- A) Check titers before doing anything
- B) Tell that she is too old to be vaccinated for HPV
- C) Give the final shot now and tell her she has completed the series
- D) Re-start the series
Dosing Interval and Contraindications

- If interval is prolonged, you do **NOT** need to restart

- If shorter interval, dose should be repeated

- History of sexual activity or previous HPV infection (including genital warts) is not a contraindication to vaccination
  
  Testing before vaccination is not recommended

- Vaccine should not be given during pregnancy
  
  Has not been associated with any adverse events; if inadvertently administered, no action is needed
  Can be given to lactating women who are breastfeeding

(Feemster, 2013)
A 17 year old girl presents for school entry. She received her first dose of HPVV at 13 years and 1 month later received the second dose. She hasn’t been back to your office since then, but now wants to get up to date with immunizations. You should tell her that her provider will likely:

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- C) **Give the final shot now and tell her she has completed the series**
- D) Re-start the series
Addressing the Challenges

Talking About the HPV Vaccine
Adverse Effects

Which of the following are contraindications to HPV vaccination? (Choose all that apply)

- A) Egg allergy
- B) Latex allergy
- C) Yeast allergy
- D) Pregnancy
- E) Prior history of fainting
- F) Autism
Which of the following are contraindications to HPV vaccinations? (Choose all that apply)

- A) Egg allergy – no problem with either vaccine
- B) Latex allergy – problem only with Cerverix®
- C) Yeast allergy – problem only with Gardasil®
- C) Pregnancy – do not give, if you do inadvertently, then please report patient to the registry
- E) Prior history of fainting – fainting is common in adolescent vaccines, it is not a contraindication
- F) Autism – no problem with either vaccine
Front Line in Overcoming Immunization Reluctance:

- You and your staff......
Scared of Side Effects

Emphasizing that the side effects are minor and highlighting the extensive research that vaccines must undergo can help parents feel reassured.

“This is not a new vaccine and for years the HPV vaccine has been shown to be very effective and very safe. The HPV vaccine has been very carefully studied by scientific experts and its safety is continually monitored. Just like with other shots, side effects can happen, but most are mild, primarily pain or redness in the arm. The symptoms should go away quickly, and the HPV vaccine has not been associated with any long-term side effects.”

“Around 57 million doses of the HPV vaccine have been distributed in the U.S. over the last 8 years, and in all the years of HPV vaccine safety studies and monitoring, no serious safety concerns have been identified.”

“There is no data to suggest that getting HPV vaccine will have an effect on future fertility. However, persistent HPV infection can cause cervical cancer and the treatment of cervical cancer can leave women unable to have children.”

Safety reviews of the HPV vaccine have consistently demonstrated an excellent safety profile.

Side effects are primarily minor and are common among all adolescent vaccines. Most common non-serious side effects are: Fainting, dizziness, nausea, headache, low fever, hives, and injection-site pain, redness, and swelling (Fainting is common after injections, especially among adolescents; therefore, it is recommended the patient remains sitting or lying down for 15 minutes after receiving an injection.)

Most common serious side effects are: Headache, vomiting, fatigue, fever, and generalized weakness.
What’s in a Recommendation?

- Studies consistently show that a strong recommendation from you is the single best predictor of vaccination
  - Routine vaccination on schedule, with the opportunity to opt out available but discouraged

- All medical office staff plays a role in delivering a strong recommendation

- Moms who had not received a doctor’s recommendation stated that they questioned why they had not been told about it and wondered if the vaccine was truly necessary

Do Not Red Flag
HPVV
Key Messages for Parents

- It is essential to get ALL 3 SHOTS for the vaccine to be most effective

- Vaccine is best at 11 or 12 years old – best BEFORE exposure

- Vaccine is recommended for BOYS and GIRLS

- This is a vaccine to prevent CANCER

- This vaccine is SAFE and EFFECTIVE

- Studies show vaccine DOES NOT encourage or increase sexual activity
Formative Research:
Focus Groups with Philadelphia Moms

CDC funded study conducted in July 2013 with mothers of children 10-15 years old

Forty-four 60-minute focus groups with mothers of children 10-15 years of age (300 mothers in total)
Three cities: Philadelphia, PA, Birmingham, AL, Sunnyvale, CA
Segmented by: Language (English/Spanish), Gender of child (Male/Female), Education level (Some college or less/Bachelor’s degree and above)
Also taken into account: age, race, marital status

• Key findings:
  • All respondents knew about the vaccine preventing cervical cancer, but lacked knowledge about other HPV diseases and indications for HPV vaccine
  • Main factors that would influence mothers to vaccinate their child against HPV were:
    • The vaccine prevents cancer
    • Their doctor recommended the vaccine
    • Personal experience/knowledge of someone with cervical cancer
    • Social responsibility – protect future partners from HPV

(CDC, 2013c)
Reasons for Not Vaccinating Females vs. Males, NIS-Teen 2011

- Not Sexually Active
  - Parents of Girls: 13.6%
  - Parents of Boys: 19.5%

- Safety Concerns
  - N/A
  - Parents of Girls: 19.3%
  - Parents of Boys: 19.3%

- Lack of Knowledge
  - Parents of Girls: 15.1%
  - Parents of Boys: 15.2%

- Not Needed/Not Necessary
  - Parents of Girls: 25.3%
  - Parents of Boys: 23.2%

- Not Recommended
  - Parents of Girls: 9.6%
  - Parents of Boys: 22.7%

(Darden, et al. [as cited in Feemster, 2013])
HPV Vaccine and Initiation of Sexual Activity

Will this couple’s decision about whether or not to initiate sexual activity tonight depend on their HPV vaccination status?
HPV Vaccine Does Not Increase Sexual Activity

Study by Kaiser Permanente Center for Health Research
1,398 girls who were 11-12 in 2006, 30% of whom were vaccinated, followed through 2010

- Study concluded receiving dose of HPV vaccine does not increase sexual activity or decrease age of sexual debut
- No difference in markers of sexual activity, including
  - Pregnancies
  - Counseling on contraceptives
  - Testing for, or diagnoses of, sexually transmitted infections

(CDC, 2013g)
Are people getting that it’s for Cancer prevention or are parents still focused on the sexual health aspects?
In your experience, do personal anecdotes influence parents’ immunization decisions?

- Do you have HPPV related anecdotes that you could share?
Have parents had questions that you have had a tough time answering?
Conclusion & Resources
Additional Efforts

- Multimedia communications campaign to run in 2014, targeted to parents and adolescents in Philadelphia
- AFIx visits will now include an adolescent component and more thorough assessments of HPV vaccination
- Every under-immunized adolescent will receive a reminder/recall postcard indicating they are overdue for a vaccine
Thank You
Toolkits

- HPV Information Sheet for providers
- Tips for discussing HPV with patients and parents
- Reducing barriers to series initiation and completion
- Waiting room posters
- Patient and parent brochures and handouts
- Links for additional information