

## Human Papillomavirus Vaccine: AAP's Recommendations

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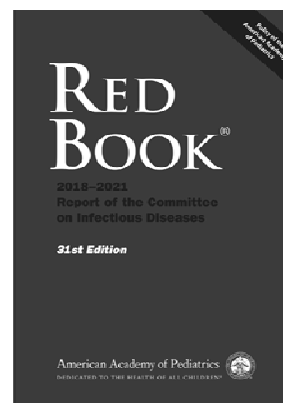
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## Declaration of Disclosure

- In the past 12 months, I have had the following financial relationships with the manufacturer of any commercial product(s) and/or provider(s) of commercial service(s) discussed in this CME activity:
  - Alios – Research Grant for RSV treatment study
  - Novavax – Pending Research Grant for RSV vaccine study
  - All monies go directly to my university and not to me
- I do not intend to discuss an unapproved/investigative use of a commercial product/device in my presentation



## Human Papillomavirus Vaccines

- On October 7, 2016, FDA approved a 2-dose series for HPV9 in persons age 9-14 years
- Through 2014, almost all HPV vaccine used in the U.S. was HPV4
- By 2016, almost all HPV vaccine used was HPV9
- HPV4 and HPV2 no longer available in U.S.

## Geometric Mean Titers Following 2 vs. 3 Doses of HPV4

| Assay (cLIA) | Girls (0,6 month)              |                                | Women (0,2,6 month)          |
|--------------|--------------------------------|--------------------------------|------------------------------|
|              | 5 months to < 6 months (n=162) | ≥ 6 months to 7 months (n=112) | 5 months to 7 months (n=286) |
| Anti-HPV 6   | 1613                           | 1720                           | 771                          |
| Anti-HPV 11  | 1333                           | 1468                           | 581                          |
| Anti-HPV 16  | 7845                           | 8238                           | 3154                         |
| Anti-HPV 18  | 1821                           | 1949                           | 762                          |

### **Human Papillomavirus Vaccine 2 Doses vs. 3 Doses**

- For persons initiating vaccination before the 15th birthday, the recommended immunization schedule is 2 doses of HPV vaccine (0, 6-12 month schedule)
- For persons initiation vaccination on or after the 15th birthday, the recommended immunization schedule is 3 doses of HPV vaccine (0, 1-2, 6 month schedule)

### **Human Papillomavirus Vaccine Additional Information**

- Persons who initiated vaccination with HPV9, HPV4, or HPV2 before the 15th birthday, and received either 2 doses or 3 doses at the recommended dosing schedule are considered adequately vaccinated
- Persons who initiated vaccination with HPV9, HPV4, or HPV2 on or after the 15th birthday, and received 3 doses at the recommended dosing schedule, are considered adequately vaccinated

### **Human Papillomavirus Vaccine Additional Information**

- HPV9 may be used to continue or complete a series started with HPV4 or HPV2
- For persons who have been adequately vaccinated with HPV2 or HPV2, there are no recommendation for additional vaccination with HPV9
- If the vaccine schedule is interrupted, the vaccination series does not need to be restarted

### **Human Papillomavirus Vaccine Immunocompromised Patients**

- Immunocompromised females and males aged 9 through 26 years should receive 3 doses of HPV vaccine (0, 1-2, 6 month)
- Persons who should receive 3 doses:
  - Primary or secondary immunocompromising conditions that might reduce cell-mediated or humoral immunity
  - HIV infection

### **Human Papillomavirus Vaccine Immunocompromised Patients**

- Malignant neoplasm or transplantation
- Autoimmune disease or immunosuppression therapy
- Recommendation for a 3-dose schedule does not apply to children aged < 15 years with asplenia, asthma, chronic granulomatous disease, chronic heart/liver/lung/renal disease, CNS anatomic barrier defects (e.g. cochlear implant), complement deficiency, diabetes, or sickle cell disease.

### **Age at Initiation of HPV Vaccination and Completion of Vaccine Series**

- Rochester Epidemiology Project contains data on 9.5 to 27 year olds in Olmsted County, Minnesota
- Links data on medical care delivered in county, including dates of visits, addresses, and demographic data
- HPV vaccinations from August 2, 2006, through December 31, 2012, were captured

Preventive Medicine 2016;89:327-333

### Age at Initiation of HPV Vaccination and Completion of Vaccine Series

| Characteristic                                    | Age at Initiation of HPV Vaccination Series |                   | P-value |
|---------------------------------------------------|---------------------------------------------|-------------------|---------|
|                                                   | 9-10 years                                  | 11-12 years       |         |
| Completed 3 doses of vaccine by 13.5 years of age | 707/725 (97.5%)                             | 1258/1613 (78.0%) | <0.001  |
| Completed 3 doses of vaccine by 15 years of age   | 722/725 (99.6%)                             | 1517/1613 (94%)   | <0.001  |
| Completed 2 doses of vaccine by 13.5 years of age | 946/951 (99.5%)                             | 2071/2259 (91.7%) | <0.001  |
| Completed 2 doses of vaccine by 15 years of age   | 950/951 (99.9%)                             | 2210/2259 (97.8%) | <0.001  |

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### Completion of 3-Dose Vaccination Series

| Characteristic                    | Unadjusted OR (95% CI) | P-value | Adjusted OR (95% CI)* | P-value |
|-----------------------------------|------------------------|---------|-----------------------|---------|
| Completion of vaccine by age 13.5 |                        |         |                       |         |
| Initiation at 11-12               | Reference              | <0.001  | Reference             | <0.001  |
| Initiation at 9-10                | 11.08 (6.84, 17.96)    |         | 12.82 (7.83, 20.99)   |         |
| Completion of vaccine by age 15   |                        |         |                       |         |
| Initiation at 11-12               | Reference              | <0.001  | 14.21 (4.97, 40.65)   | <0.001  |
| Initiation at 9-10                | 15.23 (4.81, 48.22)    |         |                       |         |

\* Adjusted for gender, race, insurance status, and year of first vaccination  
Preventive Medicine 2016;89:327-333

### Completion of 2-Dose Vaccination Series

| Characteristic                    | Unadjusted OR (95% CI) | P-value | Adjusted OR (95% CI)* | P-value |
|-----------------------------------|------------------------|---------|-----------------------|---------|
| Completion of vaccine by age 13.5 |                        |         |                       |         |
| Initiation at 11-12               | Reference              | <0.001  | Reference             | <0.001  |
| Initiation at 9-10                | 17.17 (7.04, 41.87)    |         | 22.09 (8.96, 54.50)   |         |
| Completion of vaccine by age 15   |                        |         |                       |         |
| Initiation at 11-12               | Reference              | 0.003   | 22.62 (3.09, 165.44)  | 0.002   |
| Initiation at 9-10                | 21.04 (2.90, 152.43)   |         |                       |         |

\* Adjusted for gender, race, insurance status, and year of first vaccination  
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### 2018 Red Book

- The American Academy of Pediatrics and the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention recommend routine HPV vaccination for females and males. The AAP recommends starting the series between 9 and 12 years, at an age that the provider deems optimal for acceptance and completion of the vaccination series.

### 2018 Red Book

- The ACIP recommends starting the series at age 11 or 12 years of age and states that vaccination can be administered starting at age 9 years. When HPV vaccine is begun at 9 or 10 years of age, other adolescent vaccines (eg, MenACWY and Tdap) still are recommended to be administered only at 11 to 12 years of age.

### 2018 Red Book

- Providers are encouraged to recommend use of HPV vaccine as they do all other routine childhood and adolescent vaccines. Research has demonstrated that parents are influenced by the strong recommendations and personal testimonials of their child's pediatrician.

## **2018 Red Book**

- **Opportunities to prevent cancers and deaths are being missed by clinicians who focus on HPV vaccine as a sexually transmitted infection vaccine rather than a cancer prevention vaccine, or who solicit parents' opinion about HPV vaccine rather than announce vaccination as routinely indicated.**

