Human Papillomavirus – 2017

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Human Papillomavirus (HPV) Disease

- Most common sexually transmitted infection in the U.S.
- Small DNA virus
- More than 150 types
- First vaccine was licensed in 2006
Human Papillomavirus Type and Disease Association

- **Cutaneous** (other types)
  - "Common" Warts (hands/feet)

- **Mucosal** (~40 types)
  - "High-risk" Types (16, 18, others)
  - Low-grade cervical abnormalities
  - High grade abnormalities/
  - Cancer precursors
  - Anogenital cancers

- **"Low-risk" Types** (6, 11, others)
  - Low-grade cervical abnormalities
  - Genital warts
  - Respiratory papillomas
Natural History of HPV Infection

Within 1 Year
- Initial HPV Infection
  - Persistent Infection
  - CIN* 1
  - Cleared HPV Infection

1-5 Years
- Persistent Infection
  - CIN* 2/3

Up to Decades
- CIN* 2/3
  - Cervical Cancer

*CIN = cervical intraepithelial neoplasia
Most HPV infections are asymptomatic and result in no clinical disease

Clinical manifestations of HPV infection include:

- Anogenital warts
- Recurrent respiratory papillomatosis
- Cervical cancer precursors (cervical intraepithelial neoplasia)
- Cancer (cervical, anal, vaginal, vulvar, penile, and some orpharyngeal cancers)
### Cancers Caused by HPV, United States

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>Average number of cancers per year probably caused by any HPV type&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Percentage per year by any HPV type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
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<tr>
<td>Anus</td>
<td>1,600</td>
<td>3,200</td>
</tr>
<tr>
<td>Cervix</td>
<td>0</td>
<td>10,600</td>
</tr>
<tr>
<td>Oropharynx</td>
<td>9,600</td>
<td>2,000</td>
</tr>
<tr>
<td>Penis</td>
<td>700</td>
<td>0</td>
</tr>
<tr>
<td>Vagina</td>
<td>0</td>
<td>600</td>
</tr>
<tr>
<td>Vulva</td>
<td>0</td>
<td>2,500</td>
</tr>
</tbody>
</table>

<sup>1</sup>HPV types detected in genotyping study; most were high-risk HPV types known to cause cancer (Saraiya M et al. US assessment of HPV types in cancers: implications for current and 9-valent HPV vaccines. Journal of the National Cancer Institute 2015;107:djv086).

CDC, United States Cancer Statistics (USCS), 2006-2010 [www.cdc.gov/cancer/hpv/statistics/cases.htm](http://www.cdc.gov/cancer/hpv/statistics/cases.htm)
HPV Epidemiology

- **Reservoir**  Human
- **Transmission**  Direct contact (usually sexual)
- **Temporal pattern**  None
- **Communicability**  Presumed to be high
Cumulative Incidence of any HPV Infection Months after Sexual Initiation

![Graph showing cumulative incidence of HPV infection over months since first intercourse]

4 years, >50%

*Am J Epidemiol 2003;157(3):218-26*
HPV Disease Burden in the U.S.

- Estimated 79 million persons are infected
  - ~ 14 million new infections annually

- Common among adolescents and young adults
  - 50% of new infections occur in persons 15–24 years of age

- About $8 billion spent annually on management of sequelae of HPV infections
Cervical Cancer Screening

- Revised in 2012
- Screening should begin at age 21 years
- Screen women 21 to 65 years of age with Pap test every 3 years
- Co-testing (Pap and HPV testing) every 5 years in women 30 to 65 years of age
Human Papillomavirus Vaccine

- HPV L1 major capsid protein of the virus is antigen used for immunization
- L1 protein produced using recombinant DNA technology
- L1 proteins self-assemble into virus-like particles (VLP)
- VLPs are noninfectious and nononcogenic
Human Papillomavirus Vaccine

<table>
<thead>
<tr>
<th>HPV Vaccines</th>
<th>9-valent 9vHPV (Gardasil9)</th>
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</thead>
<tbody>
<tr>
<td>L1 VLP types</td>
<td>6, 11, 16, 18, 31, 33, 45, 52, 58</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Merck</td>
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<tr>
<td>Contraindications</td>
<td>Hypersensitivity to yeast</td>
</tr>
</tbody>
</table>

**FDA Indications**
- Females (9-26 yrs): Anal, cervical, vaginal, and vulvar precancer and cancer; genital warts
- Males (9-26 yrs): Anal precancer and cancer; genital warts

Only 9vHPV vaccine is available in the US
Human Papillomavirus Vaccine Efficacy

- High efficacy among females without evidence of infection with vaccine HPV types (>95%)

- No evidence of efficacy against disease caused by vaccine types participants were infected with at the time of vaccination

- Prior infection with one HPV type did not diminish efficacy of the vaccine against other vaccine HPV types
9vHPV (Gardasil9)

- Licensed by the FDA for males and females 9-26 years of age
- Trials conducted with 3-dose schedule
- Targets 5 additional high-risk types:
  - 6, 11, 16, 18, 31, 33, 45, 52, 58
9vHPV (Gardasil9)  
Efficacy and Safety

- **Efficacy**
  - ~97% protection against 31-,33-,45-,52-,58-related outcomes
  - Similar protection against 6-,11-,16-,18-related disease

- **Noninferior immunogenicity to 4vHPV**

- **5 additional types account for 11% of invasive cancers**
  - Differences by gender: 14% for females; 5% for males

- **9vHPV can be administered at the same medical visit with MenACWY and Tdap**

- **Safety profile similar to 4vHPV across age, gender, race, ethnicity groups**
Human Papillomavirus Vaccine
Duration of Immunity

- The duration of immunity after a complete 3-dose schedule is not known
  - Available evidence indicates protection for at least 8 years for 4vHPV and at least 9 years for 2vHPV
  - Multiple cohort studies are in progress to monitor the duration of immunity
# Recommended Schedule for Children and Adolescents Aged 18 Years and Younger 2017

## Figure 1. Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger—United States, 2017.

For those who fall behind or start late, see the catch-up schedule (Figure 2). These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1.

### Vaccine Schedule

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Birth</th>
<th>1 mos</th>
<th>2 mos</th>
<th>4 mos</th>
<th>6 mos</th>
<th>9 mos</th>
<th>12 mos</th>
<th>15 mos</th>
<th>18 mos</th>
<th>19-23 mos</th>
<th>2-3 yr</th>
<th>4-6 yr</th>
<th>7-10 yr</th>
<th>11-12 yr</th>
<th>13-15 yr</th>
<th>16 yr</th>
<th>17-18 yr</th>
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</thead>
<tbody>
<tr>
<td>Hepatitis B (HepB)</td>
<td></td>
<td></td>
<td>1st</td>
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<tr>
<td>Poliovirus (IPV) (IPV3; 3-dose series)</td>
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<td>1st</td>
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<td>3rd</td>
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<tr>
<td>Diphtheria, tetanus, &amp; acellular pertussis</td>
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<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
<td>5th</td>
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<tr>
<td>Haemophilus influenzae type b (Hib)</td>
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<td>1st</td>
<td>2nd</td>
<td>3rd</td>
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<tr>
<td>Pneumococcal conjugate (PCV13)</td>
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<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
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<tr>
<td>Inactivated poliovirus (IPV+18 yrs)</td>
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<td>1st</td>
<td>2nd</td>
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<td>4th</td>
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<tr>
<td>Influenza (IV)</td>
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<td>Annual vaccination (IV) 1 or 2 doses</td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
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<td>1st</td>
<td>2nd</td>
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<td>Varicella (VAP)</td>
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<td>1st</td>
<td>2nd</td>
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<tr>
<td>Hepatitis A (HepA)</td>
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<td>2-dose series, See footnote 10</td>
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<tr>
<td>Meningococcal B (Hib-MeningocO25A; Hib-MeningocO25B)</td>
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<tr>
<td>Tetanus, diphtheria, &amp; acellular pertussis</td>
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<td>Human papillomavirus (HPV)</td>
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<tr>
<td>Pneumococcal polyvalent</td>
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</tbody>
</table>

### Notes
- The above recommendations must be read along with the footnotes of this schedule.

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## Recommended Schedule for Children and Adolescents Aged 18 Years and Younger 2017

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age</th>
<th>Dose</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meningococcal (MenACWY-D)</td>
<td>7 years</td>
<td>1</td>
<td>4 weeks</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, tetanus, diphtheria, and acellular pertussis</td>
<td>7 years</td>
<td>1</td>
<td>4 weeks if first dose of DTaP/DT was administered before the 1st birthday.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>6 months (as final dose) if first dose of DTaP/DT or Tdap/Td was administered at or after the 1st birthday.</td>
</tr>
<tr>
<td>Human papillomavirus</td>
<td>9 years</td>
<td>3</td>
<td>Routine dosing intervals are recommended.</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>N/A</td>
<td>1</td>
<td>6 months</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>N/A</td>
<td>1</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Inactivated poliovirus</td>
<td>N/A</td>
<td>1</td>
<td>4 weeks and at least 16 weeks after first dose.</td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>N/A</td>
<td>1</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Varicella</td>
<td>N/A</td>
<td>1</td>
<td>3 months if younger than age 13 years. 4 weeks if age 13 years or older.</td>
</tr>
</tbody>
</table>

### NOTE
The above recommendations must be read along with the footnotes of this schedule.

[https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html](https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html)
### Recommended Schedule for Children and Adolescents Aged 18 Years and Younger 2017

**Figure 3. Vaccines that might be indicated for children and adolescents aged 18 years or younger based on medical indications**

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>INDICATION</th>
<th>Immunocompromised Status (excluding HIV infection)</th>
<th>HIV Infection CD4+ (&gt;500 cells/µL)</th>
<th>HIV Infection CD4+ (&lt;500 cells/µL)</th>
<th>Kidney Failure, end-stage renal disease, on hemodialysis</th>
<th>Heart Disease, chronic lung disease</th>
<th>CSF leaks / cerebral implants</th>
<th>Autoimmune and persistent complement component deficiencies</th>
<th>Chronic Liver Disease</th>
<th>Diabetes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis A*</td>
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<td>Rotavirus*</td>
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<tr>
<td>Diptheria, tetanus, &amp; acellular pertussis (DTaP)</td>
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<tr>
<td>Hemophilus influenzae type b</td>
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<tr>
<td>Pneumococcal conjugate</td>
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<td>Inactivated poliovirus</td>
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<tr>
<td>Measles, mumps, rubella</td>
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<td>Varicella</td>
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<tr>
<td>Haemophilus A*</td>
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<tr>
<td>Meningococcal ACWY*</td>
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<td>Tetanus, diphteria, &amp; acellular pertussis (DTaP)</td>
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<tr>
<td>Human papillomavirus</td>
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<tr>
<td>Measurans</td>
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<td>Pneumococcal polysaccharide</td>
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</table>

*Severe Combined Immunodeficiency

NOTE: The above recommendations must be read along with the footnotes of this schedule.

[https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html](https://www.cdc.gov/vaccines/schedules/hcp/imz/child-adolescent.html)
Recommended Immunization Schedule for Adults Aged 19 Years or Older 2017

Recommended Immunization Schedule for Adults Aged 19 Years or Older 2017

Human Papillomavirus Vaccine
Routine Recommendations

▪ Routinely vaccinate boys and girls at 11–12 years of age*

▪ Catch-up those previously unvaccinated or are missing doses including:
  • Females age 13 through 26 years
  • Males age 13 through 21 years
  • High-risk males age 22 through 26 years
    o Men who have sex with men and immunocompromised men (including HIV-infected men)

▪ Males aged 22 through 26 years of age may be vaccinated

*Vaccination series can be started at 9 years of age

MMWR 2015;64:300-4
Human Papillomavirus Vaccine
ACIP Recommendations

- **Routine 3-dose schedule**: 0, 1-2, 6 months
  - Dose #2: Administer at least 1 to 2 months after dose 1
  - Dose #3: Administer at least:
    - 12 weeks after dose 2 AND
    - 6 months (24 weeks) after dose 1

- **An accelerated schedule using minimum intervals is not recommended**

*ACIP off-label recommendation, *MMWR* 2015;64(29):300-4
HPV Vaccination Schedules

- FDA has approved a 2-dose schedule for 9vHPV (Gardasil9)
- ACIP reviewed data on 2-dose schedules including data and studies of immune response, vaccine effectiveness, and duration of protection. Specifically:
  - Data from clinical trials showed two doses of HPV vaccine given in younger adolescents (aged 9-14 years) produced an immune response that was similar or higher than the response in young adults (aged 16-26 years) who received three doses.
  - Data available to date show that a 3-dose schedule in older adolescents and young adults provides long-lasting protection.
  - Study data suggest that a 2-dose schedule given to younger adolescents will also provide long-lasting protection.
ACIP HPV Immunization Recommendations
Previously Unvaccinated Adolescents

- Administer 2 doses of HPV vaccine to adolescents starting the series at 9 through 14 years of age

- Follow the routine 2-dose schedule
  - Administer dose 2 6-12 months after the 1st dose

- If a 2nd dose is inadvertently administered prior to 6 months default to a 3-dose series
ACIP Immunization Recommendations
Previously Unvaccinated Adolescents

- Administer 3 doses of HPV vaccine to adolescents starting the series on or after the 15th birthday

- Routine 3-dose schedule*: 0, 1-2, 6 months
  - Dose #2: Administer at least 1 to 2 months after dose 1
  - Dose #3: Administer at least:
    - 12 weeks after dose 2 AND
    - 6 months (24 weeks) after dose 1

- An accelerated schedule using minimum intervals is not recommended

MMWR 2016;65(49):1405-08
ACIP Immunization Recommendations
Persons with an Incomplete Series

- Adolescents who initiated vaccination with 9vHPV, 4vHPV, or 2vHPV
  - Before their 15th birthday, are fully vaccinated if they received
    o 2 doses at the recommended dosing schedule (0, 6-12 month), OR
    o 3 doses at the recommended dosing schedule (0, 1-2, 6 month)
  - On or after the 15th birthday are fully vaccinated if they received,
    o 3 doses at the recommended dosing schedule (0, 1-2, 6 month)

- All doses do not have to 9vHPV

- No additional doses are recommended, regardless of their current age

*MMWR* 2016;65(49):1405-08
ACIP HPV Immunization Recommendations

Medical Condition Considerations

- ACIP recommends HPV vaccination for immunocompromised females and males aged 9 through 26 years with 3 doses of HPV vaccine (0, 1-2, 6 months)
- Administer a 3-dose series to immunocompromised persons including those with:
  - Primary or secondary immunocompromising conditions that might reduce cell-mediated or humoral immunity, such as B lymphocyte antibody deficiencies, T lymphocyte complete or partial defects, HIV infection, malignant neoplasm, transplantation, autoimmune disease or immunosuppressive therapy
Human Papillomavirus Vaccine Administration

- Administer HPV vaccines via intramuscular (IM) injection
  - Needle size: 1- to 1½- inch, 22- to 25-gauge
  - Site: Deltoid muscle in the upper arm

- Follow proper injection practices
  - Use aseptic technique
  - Use a new needle and syringe for each injection

- Administer at the same medical visit as other vaccines
ACIP HPV Immunization Recommendations

Schedule Considerations

- Number of recommended doses is based on:
  - Age at administration of the first dose OR
  - Health status – immunosuppression

- Series does not need to be restarted if interrupted
  - There is NO maximum interval between HPV vaccine doses

- HPV vaccine can be administered during the same clinical visit other vaccines

- 9vHPV may be used to continue or complete a series started with 4vHPV or 2vHPV regardless of the dosing schedule
2-Dose Clinical FAQs

Clinician FAQ: CDC Recommendations for HPV Vaccine 2-Dose Schedules

After the October 2018 IACF meeting, CDC now recommends that 11 or 12 year olds receive 2 doses of HPV vaccine instead of 3. Parents may have questions about this change. This resource helps explain the reasons for changing the HPV vaccine recommendation, and provides tips for discussing the change with the parents of your patients about the change.

What has changed in the new HPV vaccine recommendations?

In October 2018, CDC updated HPV vaccination recommendations regarding dosing schedules. Recommendations to receive 2 doses of HPV vaccine per visit vary depending on the age of the patient at the time of the initial dose. The new recommendations include removing the need for 3 doses for all patients.

What is the recommended 2-dose HPV vaccination schedule?

For girls and boys getting the vaccination series before their 15th birthday, the recommended schedule is 2 doses of HPV vaccine. The second dose should be given 0-2 months after the first dose (6-12 months if 6-11 years old).

What is the recommended 3-dose HPV vaccination schedule?

For girls and boys getting the vaccination series after their 15th birthday, the recommended schedule is 3 doses of HPV vaccine. The second dose should be given 0-2 months after the first dose (6-12 months if 6-11 years old). The third dose should be given 0-6 months after the second dose (12-36 months if 6-11 years old). If a child is starting the vaccination series after age 15, the recommended schedule is 3 doses: 0-2 months after the first dose, 6-12 months after the first dose, and 12-36 months after the first dose.

What if children start vaccination after age 11 or 12 years?

CDC recommends 2 doses at any age for those who start vaccination after age 11 or 12 years. For those starting vaccination after age 15 years, a full 3-dose series should be completed. All doses should be given at least 4 weeks apart.

Why did CDC make the recommendation change to a 2-dose schedule?

The previous recommendation was based on the assumption that the vaccine was effective for all ages. However, recent studies have shown that 2 doses of HPV vaccine given at 0-2 months apart are just as good as 3 doses given at 0-6 months apart. Therefore, CDC changed its recommendation to a 2-dose schedule in order to simplify the vaccination process and reduce the number of doses needed.

Why is the 2-dose schedule change recommended only for girls and boys age 9-14 years?

CDC makes recommendations based on the best available scientific evidence. Immunogenicity studies have shown that 2 doses of HPV vaccine given at 0-2 months apart were just as good as 3 doses given at 0-6 months apart, but only for girls, not boys. Therefore, the 2-dose schedule is recommended only for girls and boys age 9-14 years.

What are the recommended 2-dose HPV vaccination schedules for adults?

Vaccination for adults 15 years and older is recommended for individuals who have not been vaccinated or who have not completed the recommended 3-dose series. The recommended schedule is 2 doses at 0-2 months apart. The second dose should be given 6-12 months after the first dose.

What is the recommendation for persons with immune-compromising conditions?

CDC recommends 2 doses of HPV vaccine (6-12 months apart) for immune-compromised people aged 9 through 26 years. Children with immune deficiencies may have mild to moderate side effects, such as fatigue or soreness at the injection site. Therefore, it is recommended that the second dose be given at least 6 months after the first dose. The second dose should be given 6-12 months after the first dose. If a child has a condition that makes the second dose recommended after the first dose, it should be given 12-36 months after the first dose.

If a child has already received 1 dose of HPV vaccine:

If a child has already received 1 dose of HPV vaccine, the recommended schedule is 2 doses at 0-2 months apart. The second dose should be given 0-6 months after the first dose.

If a child has received 2 doses:

If a child has already received 2 doses of HPV vaccine with no adverse events, no additional doses are needed.

If a child has received 2 doses and a dose is missed:

If a child has already received 2 doses of HPV vaccine and one dose is missed, the recommended schedule is 2 doses at 0-2 months apart. The second dose should be given 0-6 months after the first dose.

If a child has received 3 doses:

If a child has already received 3 doses of HPV vaccine, no additional doses are needed.

Resources:

ACIP HPV Immunization Recommendations
Additional Considerations

- For persons who have completed a series of 4vHPV or 2vHPV, there is no ACIP recommendation for additional vaccination with 9vHPV

- No therapeutic effect on HPV infection, genital warts, cervical lesions

- Prevaccination assessments not recommended
  - HPV
  - Pregnancy
Human Papillomavirus Vaccine
Product Interchangeability

- No data on schedules that include 2vHPV and 4vHPV and/or 9vHPV
- Response to types 16 and 18 likely to be similar when 2vHPV, 4vHPV, or 9vHPV used in the same series
- Protection against types other than 16 and 18 is probably reduced if fewer than 3 doses of 4vHPV or 9vHPV received
- Use same vaccine for all doses whenever possible
Human Papillomavirus Vaccine
Special Situations

- Administer vaccine to:
  - Females who:
    - Have equivocal or abnormal Pap test
    - Have positive HPV DNA test
    - Are breast-feeding
  - Males and females who:
    - Have genital warts
    - Are immunosuppressed
Initiation of the vaccine series should be delayed until after completion of pregnancy.

If a woman is found to be pregnant after initiating the vaccination series, remaining doses should be delayed until after the pregnancy.

If a vaccine dose has been administered during pregnancy, there is no indication for intervention.

Women vaccinated during pregnancy should be reported to the respective manufacturer.
- Active pregnancy registry for 9vHPV established; others are closed.
- Contact information is in the package insert.

Human Papillomavirus Vaccine and Pregnancy

MMWR 2014;63(No. 5):1-30
MMWR 2015;64(29):300-4
Human Papillomavirus Vaccine
Contraindications and Precautions

- **Contraindication**
  - Severe allergic reaction to a vaccine component or following a prior dose

- **Precaution**
  - Moderate or severe acute illnesses (defer until symptoms improve)
### Adverse Events Following Any Dose of HPV Vaccine Among Females*

<table>
<thead>
<tr>
<th>Adverse Event</th>
<th>2vHPV</th>
<th>4vHPV</th>
<th>9vHPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>92%</td>
<td>84%</td>
<td>89%</td>
</tr>
<tr>
<td>Swelling</td>
<td>44%</td>
<td>29%</td>
<td>40%</td>
</tr>
<tr>
<td>Erythema</td>
<td>48%</td>
<td>25%</td>
<td>34%</td>
</tr>
<tr>
<td>Fever</td>
<td>13%</td>
<td>13%</td>
<td>5%</td>
</tr>
<tr>
<td>Nausea</td>
<td>7%</td>
<td>GI 28%**</td>
<td>4%</td>
</tr>
<tr>
<td>Headache</td>
<td>12%</td>
<td>55%</td>
<td>11%</td>
</tr>
</tbody>
</table>

*FDA product approval data

**GI = Gastrointestinal symptoms, including nausea, vomiting, diarrhea, and/or abdominal pain
Syncope Following Vaccination

- An increase in the number of reports of syncope has been detected by the Vaccine Adverse Event Reporting System (VAERS)
  - Most of the increase among females 11-18 years

- Serious injuries have resulted

- ACIP recommends providers strongly consider observing patients for 15 minutes after they are vaccinated
Vaccine Storage and Handling

- Store HPV vaccine in a refrigerator between 2°C - 8°C (36°F - 46°F)

- Store HPV vaccines:
  - In the original packaging with the lids closed
  - In a clearly labeled bin and/or area of the storage unit

- Do not freeze the vaccine

Vaccine storage label example
Available at www.cdc.gov/vaccines/hcp/admin/storage/guide/vaccine-storage-labels.pdf
## HPV Immunization Rates
### Females 13-17 Years of Age, 2016

<table>
<thead>
<tr>
<th>HPV Vaccine</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Females</td>
</tr>
<tr>
<td>1 or more doses*</td>
<td>65.1%</td>
</tr>
<tr>
<td>HPV UTD**</td>
<td>49.5%</td>
</tr>
</tbody>
</table>

Percentages ≥1 human papillomavirus vaccine, either 4vHPV, or 2vHPV

**HPV UTD includes those with ≥3 doses, and those with 2 doses when the first HPV vaccine dose was initiated before age 15 years and time between the first and second dose was at least 5 months minus 4 days

*MMWR 2017; 65(No. 33): 850-58*
HPV Vaccine Communications during the Health Care Encounter

- HPV vaccine is often presented as optional, whereas other adolescent vaccines are recommended.
- Some expressed mixed or negative opinions about relatively new vaccines and concerns over safety and efficacy.
- When parents express reluctance, providers are hesitant to engage in discussion.
- Some providers share parents’ views that teen is not at risk for HPV and vaccination can be delayed until older.

Strategies for Increasing HPV Vaccination Rates in Clinical Practices

- Recommend HPV vaccine!
  - Include HPV vaccine when discussing other recommended vaccines

- Integrate standard procedures supporting vaccination
  - Assess for needed vaccines at every clinical encounter.
  - Immunize at every opportunity
  - Use standing orders

- Reminder and recall

- Tools for improving uptake of HPV at [www.cdc.gov/vaccines/teens](http://www.cdc.gov/vaccines/teens)
HPV Vaccination Resources for HCP

www.cdc.gov/vaccines/YouAreTheKey
Human Papillomavirus Vaccine
Resources

- Human papillomavirus resource pages at www.cdc.gov/vaccines/ed/webinar-epv/

- Includes information for
  - Health care providers on
    - Disease and treatment
    - Vaccine administration, storage and handling
  - Parents and patients on
    - Disease
    - Vaccine safety
  - Partners and programs
    - Print, matte articles, online, video and audio resources