Hit Me With Your Best Shot: Updates to the 2021 Children and Adolescent Immunization Schedule

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Professor of Pediatrics
Zucker School of Medicine at Hofstra/Northwell
Cohen Children’s Medical Center
Disclosure and Disclaimer

- In the past 12 months I have had the following financial relationships with manufacturer(s) of commercial product(s) and/or provider(s) of commercial service(s):
  - Member – Centers for Disease Control and Prevention Advisory Committee on Immunization Practices
  - Editor – *Current Opinion in Pediatrics*, Office Pediatrics series
  - Member – Takeda Data and Safety Monitoring Board
  - Principal Investigator – New York State Department of Health breastfeeding grant

- I do not intend to discuss any unapproved/investigative uses of a commercial product/device in my presentation.

- The views presented in this didactic do not necessarily represent the views and opinions of the American Academy of Pediatrics or the Centers for Disease Control and Prevention.
Objectives of Today’s Presentation

- Review the Recommended Childhood and Adolescent Immunization Schedule for 2021.
- Share the rationale for the latest updates to the immunization schedules.
- Understand the process for approval of COVID-19 vaccine in children.
Immunization Schedules

- **Updated each year**
  - Represents current, approved Advisory Committee on Immunization Practices (ACIP) policy.
  - Designed for implementation of ACIP policy.

- **Approved by**
  - Centers for Disease Control and Prevention (CDC) Director
  - American Academy of Pediatrics
  - American Academy of Family Physicians
  - American College of Obstetricians and Gynecologists
  - American College of Nurse-Midwives
  - American Academy of Physician Assistants
  - National Association of Pediatric Nurse Practitioners

- **Published in February 2021**
  - *Morbidity and Mortality Weekly Report* (MMWR) Notice to Readers – announcement of availability of schedules on CDC immunization schedule website
FIGURE. Weekly changes in Vaccines for Children Program (VFC) provider orders* and Vaccine Safety Datalink (VSD) doses administered† for routine pediatric vaccines — United States, January 6–April 19, 2020

Updates in ACIP Recommendations for CDC Policy Statements Published after 2020 Schedule Approval

- **Influenza vaccination**
  - 2020-21 influenza vaccination recommended for all persons 6 months and older who do not have contraindications

- **Meningococcal A,C,W,Y vaccination**
  - Summary of all recommendations from the CDC ACIP for use of meningococcal vaccines in the United States
Updates in ACIP Recommendations for CDC Policy Statements Published after 2020 Schedule Approval

COVID-19 vaccination

- Pfizer-BioNTech COVID-19 vaccine
  - Interim recommendations for use of Pfizer-BioNTech COVID-19 vaccine, United States

- Moderna COVID-19 vaccine
  - Interim recommendations for use of Moderna COVID-19 vaccine, United States

- Janssen COVID-19 vaccine
  - Oliver SE, et al. *MMWR*. ePub: 2 March 2021
  - Interim recommendations for use of Janssen COVID-19 vaccine, United States
### Vaccines in the Child and Adolescent Immunization Schedule*

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Abbreviations</th>
<th>Trade names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria, tetanus, and acellular pertussis vaccine</td>
<td>DTaP</td>
<td>Daptacel® Infanrix®</td>
</tr>
<tr>
<td>Diphtheria, tetanus vaccine</td>
<td>DT</td>
<td>No trade name</td>
</tr>
<tr>
<td><em>Haemophilus influenzae</em> type b vaccine</td>
<td>Hib (PRP-T)</td>
<td>ActHib® Hibrix® PedvaxHib®</td>
</tr>
<tr>
<td>Hib (PRP-CMP)</td>
<td>Hib</td>
<td></td>
</tr>
<tr>
<td>Hepatitis A vaccine</td>
<td>HepA</td>
<td>Havrix® Vaqta®</td>
</tr>
<tr>
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<td>HepB</td>
<td>Engerix-B® Recombivax HB®</td>
</tr>
<tr>
<td>Human papillomavirus vaccine</td>
<td>HPV</td>
<td>Gardasil 9®</td>
</tr>
<tr>
<td>Influenza vaccine (inactivated)</td>
<td>IIV</td>
<td>Multiple</td>
</tr>
<tr>
<td>Influenza vaccine (live, attenuated)</td>
<td>LAIV&lt;sup&gt;4&lt;/sup&gt;</td>
<td>FluMist® Quadrivalent</td>
</tr>
<tr>
<td>Measles, mumps, and rubella vaccine</td>
<td>MMR</td>
<td>M-M-R II®</td>
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<tr>
<td>Meningococcal serogroups A, C, W, Y vaccine</td>
<td>MenACWY-D</td>
<td>Menactra®</td>
</tr>
<tr>
<td>MenACWY-CRM</td>
<td>MenACWY-TT</td>
<td>Menveo®</td>
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<tr>
<td>Meningococcal serogroup B vaccine</td>
<td>MenB-4C</td>
<td>MonQuadRx®</td>
</tr>
<tr>
<td>MenB-F-Hbp</td>
<td>Trumembza®</td>
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</tr>
<tr>
<td>Pneumococcal 13-valent conjugate vaccine</td>
<td>PCV13</td>
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<td>Pneumococcal 23-valent polysaccharide vaccine</td>
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</tr>
<tr>
<td>Poliovirus vaccine (inactivated)</td>
<td>IPV</td>
<td>IPOL&lt;sup&gt;®&lt;/sup&gt;</td>
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<tr>
<td>Rotavirus vaccine</td>
<td>RV1</td>
<td>Rotarix®</td>
</tr>
<tr>
<td>Rotavirus vaccine</td>
<td>RV5</td>
<td>RotaTeq®</td>
</tr>
<tr>
<td>Tetanus, diphtheria, and acellular pertussis vaccine</td>
<td>Tdap</td>
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</tr>
<tr>
<td>Tetanus and diphtheria vaccine</td>
<td>Td</td>
<td>Tenivac® TdVac&lt;sup&gt;®&lt;/sup&gt;</td>
</tr>
<tr>
<td>Varicella vaccine</td>
<td>VAR</td>
<td>Varivax®</td>
</tr>
</tbody>
</table>

### How to use the child/adolescent immunization schedule

1. Determine recommended vaccine by age (Table 1)
2. Determine recommended interval for catch-up vaccination (Table 2)
3. Assess need for additional recommended vaccines by medical condition and other indications (Table 3)
4. Review vaccine types, frequencies, intervals, and considerations for special situations (Notes)

Report
- Suspected cases of reportable vaccine-preventable diseases or outbreaks to your state or local health department
- Clinically significant adverse events to the Vaccine Adverse Event Reporting System (VAERS) at [www.vaers.hhs.gov](http://www.vaers.hhs.gov) or 800-822-7967

**Instructions on how to use**

Download the CDC Vaccine Schedules App for providers at [www.cdc.gov/vaccines/schedules/hcp/schedule-app.html](http://www.cdc.gov/vaccines/schedules/hcp/schedule-app.html).

**Helpful information**
- Complete ACIP recommendations: [www.cdc.gov/vaccines/hcp/acip-recs/index.html](http://www.cdc.gov/vaccines/hcp/acip-recs/index.html)
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*Administer recommended vaccines if immunization history is incomplete or unknown. Do not restart or add doses to vaccine series for extended intervals between doses. When a vaccine is not administered at the recommended age, administer at a subsequent visit. The use of trade names is for identification purposes only and does not imply endorsement by the ACIP or CDC.
Recommended Child and Adolescent Immunization Schedule
for ages 18 years or younger

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Vaccines in the Child and Adolescent Immunization Schedule*

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<th>Vaccines</th>
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<td>Diphtheria, tetanus, and acellular pertussis vaccine</td>
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<td>MenB-4C</td>
<td>Beexero®</td>
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<td>Td</td>
<td>Torva® Rotarix®</td>
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<tr>
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<td>Varicella</td>
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</table>

Combination vaccines (use combination vaccines instead of separate injections)

| DTaP, hepatitis B, and inactivated poliovirus vaccine       | Tda           | Torva® Rostra®       |
| DTaP, inactivated poliovirus, and Haemophilus influenzae type b vaccine | Tda           | Torva® Rostra®       |
| DTaP and inactivated poliovirus                              | Tda           | Torva® Rostra®       |
| DTaP, inactivated poliovirus, Haemophilus influenzae type b, and hepatitis B vaccine | DTaP-IPV-Hib-HeP8 | Vaxelis® |
| Measles, mumps, rubella, and varicella vaccine               | MMRV          | ProQuad®             |

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Links to additional resources
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</tr>
<tr>
<td></td>
<td>Hib (PRP-OMP)</td>
<td>Hibrix®</td>
</tr>
<tr>
<td></td>
<td>HepA</td>
<td>Havrix®</td>
</tr>
<tr>
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<td>HepB</td>
<td>Engerix-B®</td>
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<td></td>
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<td>MenACWY-TT</td>
<td>MenQuad®</td>
</tr>
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<td>MenB-4C</td>
<td>Bexsero®</td>
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<td>MenB-FHbp</td>
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<td>OPOL®</td>
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<tr>
<td>Rotavirus vaccine</td>
<td>EV1</td>
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<td>Td</td>
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<thead>
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<th>Combination Vaccines</th>
<th>Abbreviations</th>
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</tr>
</thead>
<tbody>
<tr>
<td>DTaP, hepatitis B, and inactivated poliovirus vaccine</td>
<td>DTaP-HepB-IPV</td>
<td>Pediarix®</td>
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<tr>
<td>DTaP, inactivated poliovirus, and <em>Haemophilus influenza</em> type b vaccine</td>
<td>DTaP-IPV/Hib</td>
<td>Pentacel®</td>
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<td>DTaP and inactivated poliovirus vaccine</td>
<td>DTaP-IPV</td>
<td>Kinrix®</td>
</tr>
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<td>DTaP, inactivated poliovirus, <em>Haemophilus influenza</em> type b, and hepatitis B vaccine</td>
<td>DTaP-IPV-Hib-HepB</td>
<td>Vaxells®</td>
</tr>
<tr>
<td>Measles, mumps, rubella, and varicella vaccine</td>
<td>MMRV</td>
<td>ProQuad®</td>
</tr>
</tbody>
</table>

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List of vaccines, abbreviations, trade names

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**CDC**

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**U.S. Department of Health and Human Services**
- Centers for Disease Control and Prevention
# Table 1: Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

These recommendations must be read with the notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars. To determine minimum intervals between doses, see the catch-up schedule (Table 2). School entry and adolescent vaccine age groups are shaded in gray.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Birth</th>
<th>1 mo</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 yrs</th>
<th>4-6 yrs</th>
<th>7-10 yrs</th>
<th>11-12 yrs</th>
<th>13-15 yrs</th>
<th>16 yrs</th>
<th>17-18 yrs</th>
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</thead>
<tbody>
<tr>
<td>Hepatitis B (HepB)</td>
<td></td>
<td>1st</td>
<td></td>
<td>2nd</td>
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<tr>
<td>Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)</td>
<td></td>
<td>1st</td>
<td>2nd</td>
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<tr>
<td>Diphtheria, tetanus, acellular pertussis (DTaP &lt;7 yrs)</td>
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<td>1st</td>
<td>2nd</td>
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<td>4th</td>
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<td>Haemophilus influenzae type b (Hib)</td>
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<td>1st</td>
<td>2nd</td>
<td>3rd</td>
<td>4th</td>
<td>5th</td>
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<td>Pneumococcal conjugate (PCV13)</td>
<td></td>
<td>1st</td>
<td>2nd</td>
<td>3rd</td>
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<td>Inactivated poliovirus (IPV &lt;18 yrs)</td>
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<td>1st</td>
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<td>Influenza (IIV)</td>
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<td>1st</td>
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<td>2nd</td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td></td>
<td>See Notes</td>
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<td>Hepatitis A (HepA)</td>
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<tr>
<td>Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)</td>
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<td></td>
<td>1st</td>
<td>2nd</td>
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</tr>
<tr>
<td>Human papillomavirus (HPV)</td>
<td></td>
<td>See Notes</td>
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<tr>
<td>Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2 years)</td>
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<tr>
<td>Meningococcal B</td>
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<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
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</tr>
</tbody>
</table>

- **Yellow**: Range of recommended ages for all children
- **Green**: Range of recommended ages for catch-up immunization
- **Purple**: Range of recommended ages for certain high-risk groups
- **Blue**: Recommended based on shared clinical decision-making or *can be used in this age group
- **Gray**: No recommendation/not applicable
Table 2: Recommended Catch-up Immunization Schedule for Children and Adolescents Who Start Late or Who Are More than 1 month Behind, United States, 2021

The table below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. **Always use this table in conjunction with Table 1 and the notes that follow.**

### Children age 4 months through 6 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Dose 1 to Dose 2</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 3 to Dose 4</th>
<th>Dose 4 to Dose 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B</td>
<td>Birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotavirus</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>8 weeks and at least 16 weeks after first dose. Minimum age for the final dose is 24 weeks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphtheria, tetanus, and acellular pertussis</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>Maximum age for final dose is 8 months, 0 days.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>No further doses needed if first dose was administered at age 15 months or older. 4 weeks if first dose was administered before the 1st birthday. 8 weeks (as final dose) if first dose was administered at age 12 through 14 months.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal conjugate</td>
<td>6 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivated poliovirus</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks if current age is &lt;4 years. 6 months (as final dose) if current age is 4 years or older.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>12 months</td>
<td>4 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td>12 months</td>
<td>3 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>12 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal ACWY</td>
<td>2 months MenACWY-CRM 9 months MenACWY-D 2 years MenACWY-TT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal ACWY</td>
<td>Not applicable (N/A)</td>
<td>8 weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Children and adolescents age 7 through 18 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Dose 1 to Dose 2</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 3 to Dose 4</th>
<th>Dose 4 to Dose 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetanus, diphtheria; tetanus, and acellular pertussis</td>
<td>7 years</td>
<td>4 weeks</td>
<td>4 weeks if first dose of DTaP/DT was administered before the 1st birthday. 6 months (as final dose) if first dose of DTaP/DT or Tdap/Td was administered at or after the 1st birthday.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus</td>
<td>9 years</td>
<td>Routine dosing intervals are recommended.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>N/A</td>
<td>6 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>N/A</td>
<td>4 weeks</td>
<td>8 weeks and at least 16 weeks after first dose.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivated poliovirus</td>
<td>N/A</td>
<td>4 weeks</td>
<td>6 months. A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>N/A</td>
<td>4 weeks</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Varicella</td>
<td>N/A</td>
<td>3 months if younger than age 13 years. 4 weeks if age 13 years or older.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VACCINE</td>
<td>Immunocompromised status (excluding HIV infection)</td>
<td>HIV Infection CD4+ count¹</td>
<td>SCID²</td>
<td>Kidney failure, end-stage renal disease, or on hemodialysis</td>
<td>Heart disease or chronic lung disease</td>
</tr>
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<td>---------------------------------------------</td>
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<tr>
<td>Hepatitis B</td>
<td>Pregnant</td>
<td></td>
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<tr>
<td>Rotavirus</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Diphtheria, tetanus, and acellular pertussis (DTaP)</td>
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</tr>
<tr>
<td>Haemophilus influenza type b</td>
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<td></td>
</tr>
<tr>
<td>Pneumococcal conjugate</td>
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<tr>
<td>Inactivated poliovirus</td>
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<tr>
<td>Flu (IV) or Flu (LAIV4)</td>
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<tr>
<td>Measles, mumps, rubella</td>
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<tr>
<td>Varicella</td>
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<tr>
<td>Hepatitis A</td>
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</tr>
<tr>
<td>Tetanus, diphtheria, and acellular pertussis (TdAP)</td>
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<tr>
<td>Human papillomavirus</td>
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<tr>
<td>Meningococcal ACWY</td>
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<tr>
<td>Meningococcal B</td>
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<tr>
<td>Pneumococcal polysaccharide</td>
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</tbody>
</table>

1 For additional information regarding HIV laboratory parameters and use of live vaccines, see the General Best Practice Guidelines for Immunization, “Altered Immuno-compentence,” at [www.cdc.gov/vaccines/hcp/acip-recs/general-recs/immunocompetence.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/immunocompetence.html) and Table 4-1 (footnote D) at [www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html).

2 Severe Combined Immunodeficiency

3 LAIV4 contraindicated for children 2–4 years of age with asthma or wheezing during the preceding 12 months.

*Vaccinate after pregnancy.*

**Notes:**
- Vaccination according to the routine schedule recommended.
- Recommended for persons with an additional risk factor for which the vaccine would be indicated.
- Vaccination is recommended, and additional doses may be necessary based on medical condition. See Notes.
- Not recommended/contraindicated—vaccine should not be administered.
- Precaution—vaccine might be indicated if benefit of protection outweighs risk of adverse reaction.
- No recommendation/not applicable.
Treat with confidence. Trusted answers from the American Academy of Pediatrics.

### COVID-19 Vaccination

ACIP recommends use of COVID-19 vaccines within the scope of the Emergency Use Authorization or Biologics License Application for the particular vaccine. Interim ACIP recommendations for the use of COVID-19 vaccines can be found at www.cdc.gov/vaccines/hcp/acip-recs/index.html.

- Consult relevant ACIP statements for detailed recommendations at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For information on contraindications and precautions for the use of a vaccine, consult the General Best Practice Guidelines for Immunization at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html and relevant ACIP statements at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html.
- For calculating intervals between doses, 4 weeks = 28 days. Intervals of ≤4 months are determined by calendar months.
- Within a number range (e.g., 12–18), a dash (–) should be read as “through.”

- Vaccine doses administered ≥4 days before the minimum age or interval are considered invalid. Doses of any vaccine administered ≥5 days earlier than the minimum age or minimum interval should not be counted as valid and should be repeated as age appropriate. The repeat dose should be spaced after the invalid dose by the recommended minimum interval. For further details, see Table 3-1: Recommended and minimum ages and intervals between vaccine doses, in General Best Practice Guidelines for Immunization at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timing.html.
- Information on travel vaccination requirements and recommendations is available at www.cdc.gov/travel/.
- For information about vaccination in the setting of a vaccine-preventable disease outbreak, contact your state or local health department.
- The National Vaccine Injury Compensation Program (VICP) is a no-fault alternative to the traditional legal system for resolving vaccine injury claims. All routine child and adolescent vaccines are covered by VICP except for pneumococcal polysaccharide vaccine (PPSV23). For more information, see www.hrsa.gov/vaccinecompensation/index.html.

### Recommendations for repeat dose after an invalid dose

- **Diphtheria, tetanus, and pertussis (DTaP) vaccination (minimum age: 6 weeks [4 years for Kinrix or Quadracel])**

  **Routine vaccination**
  - 5-dose series at 2, 4, 6, 15–18 months, 4–6 years.
  - If dose 5 is given at ≥12 months, dose 3 should also be repeated.

  **Catch-up vaccination**
  - Dose 5 is not necessary if dose 4 was administered at age 4 years or older and at least 6 months after dose 3.
  - For other catch-up guidance, see Table 2.

- **Special situations**
  - Wound management in children less than age 7 years with history of 3 or more doses of tetanus-toxoid-containing vaccine. For all wounds except clean and minor wounds, administer DTaP if more than 5 years since last dose of tetanus-toxoid-containing vaccine. For detailed information, see www.cdc.gov/mmwr/volumes/67/rr/rr6702a1.htm.

### Special situations

- **Chemotherapy or radiation treatment:**
  - 12–59 months:
    - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.
    - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.
  - Doses administered within 14 days of starting therapy or during therapy should be repeated at least 3 months after therapy completion.

- **Hematopoietic stem cell transplant (HSCT):**
  - 3-dose series 4 weeks apart starting 6 to 12 months after successful transplant, regardless of Hib vaccination history.

- **Anatomic or functional asplenia (including sickle cell disease):**
  - 12–59 months:
    - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.
    - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.

- **Unvaccinated** persons age 5 years or older:
  - 1 dose.

- **Elective splenectomy:**
  - Unvaccinated** persons age 15 months or older:
    - 1 dose (preferably at least 14 days before procedure).

- **HIV infection:**
  - 12–59 months:
    - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.
    - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.

- **Unvaccinated** persons age 5–18 years:
  - 1 dose.

- **Immunoglobulin deficiency, early component complement deficiency:**
  - 12–59 months:
    - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.
    - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.

*Unvaccinated = Less than routine series (through age 14 months) OR no doses (age 15 months or older).
Influenza Vaccine Updates

- No change in routine recommendations

- Inactivated influenza vaccines (IIVs), recombinant influenza vaccine (RIV4), and live attenuated influenza vaccine (LAIV4) are available for the 2020–21 season.

- Contraindications and precautions to influenza vaccination were revised
### Recommendations for persons with egg allergy other than hives

- **Age less than age 2 years**
- **LAIV4 and influenza antiviral medications**

---

<table>
<thead>
<tr>
<th>Hepatitis A vaccination</th>
<th>Routine vaccination: minimum age: 12 months for routine vaccination</th>
<th>Influenza vaccination: minimum age: 6 months [IV], 2 years [LAIV4], 18 years (recombinant influenza vaccine, RIV4)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Routine vaccination</strong></td>
<td>2-dose series (minimum interval: 6 months) beginning at age 12 months</td>
<td><strong>Routine vaccination</strong></td>
</tr>
<tr>
<td><strong>Catch-up vaccination</strong></td>
<td>Unvaccinated persons through age 18 years should complete a 2-dose series (minimum interval: 6 months). Persons who previously received 1 dose at age 12 months or older should receive 2 doses at least 6 months after dose 1. Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, Twinrix® as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 1, 2, and 30–days, followed by a booster dose at 12 months).</td>
<td>Use any influenza vaccine appropriate for age and health status annually:</td>
</tr>
<tr>
<td><strong>Special situations</strong></td>
<td>Revaccination is not generally recommended for persons with a normal immune status who were vaccinated as infants, children, adolescents.</td>
<td>- 2 doses, separated by at least 4 weeks, for children age 6 months–8 years who have received fewer than 2 influenza vaccine doses before July 1, 2020, or whose influenza vaccination history is unknown (administer dose 2 even if the child turns 9 between receipt of dose 1 and dose 2)</td>
</tr>
<tr>
<td><strong>Human papillomavirus</strong></td>
<td>Routine and catch-up vaccination: Minimum age: 9 years</td>
<td>- 1 dose for children age 6 months–8 years who have received at least 2 influenza vaccine doses before July 1, 2020</td>
</tr>
<tr>
<td><strong>Birth dose (monovalent HepB vaccine only)</strong></td>
<td>HPV vaccination routinely recommended at age 11–12 years (can start at age 9 years) and catch-up HPV vaccination recommended for all persons through age 18 years if not adequately vaccinated</td>
<td>- 1 dose for all persons age 9 years or older</td>
</tr>
<tr>
<td><strong>Mother is HBSAg-negative:</strong></td>
<td>2- or 3-dose series depending on age at initial vaccination:</td>
<td>For the 2021–22 season, see the 2021–22 ACIP influenza vaccine recommendations.</td>
</tr>
<tr>
<td></td>
<td>- Age 9–14 years at initial vaccination: 2-dose series at 0, 6–12 months (minimum interval: 5 months; repeat dose if administered too soon)</td>
<td>Special situations:</td>
</tr>
<tr>
<td></td>
<td>- Age 15 years or older at initial vaccination: 3-dose series at 0, 1–2 months, 6 months (minimum intervals: dose 1 to dose 2: 2 weeks / dose 2 to dose 3: 12 weeks / dose 1 to dose 3: 5 months; repeat dose if administered too soon)</td>
<td>- Egg allergy, hives only: Any influenza vaccine appropriate for age and health status annually</td>
</tr>
<tr>
<td></td>
<td>Interrupted schedules: If vaccination schedule is interrupted, the series should be restarted.</td>
<td>- Egg allergy with symptoms other than hives (e.g., angioedema, respiratory distress, need for emergency medical services or epinephrine): Any influenza vaccine appropriate for age and health status annually. If using an influenza vaccine other than Flublok or Flucelvax, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions.</td>
</tr>
<tr>
<td></td>
<td>No additional dose is required.</td>
<td>- Severe allergic reactions to vaccines can occur even in the absence of a history of previous allergic reaction. All vaccination providers should be familiar with the office emergency plan and certified in cardiopulmonary resuscitation.</td>
</tr>
<tr>
<td><strong>Mother’s HBSAg status is unknown:</strong></td>
<td>Routine series:</td>
<td>A previous severe allergic reaction to influenza vaccine is a contraindication to future receipt of any influenza vaccine.</td>
</tr>
<tr>
<td></td>
<td>- Administer HepB vaccine within 12 hours of birth, regardless of birth weight.</td>
<td><strong>LAIV4 should not be used</strong> in persons with the following conditions or situations:</td>
</tr>
<tr>
<td></td>
<td>- For infants &lt;2,000 grams, administer HBIG in addition to HepB vaccine (in separate limbs) within 12 hours of birth. Administer HBIG is administered after HBIG is administered at age 1 month.</td>
<td>- History of severe allergic reaction to a previous dose of any influenza vaccine or to any vaccine component (excluding egg, see details above)</td>
</tr>
<tr>
<td></td>
<td>Determine mother’s HBSAg status as soon as possible.</td>
<td>- Receiving aspirin or salicylate-containing medications</td>
</tr>
<tr>
<td></td>
<td>If mother is HBSAg-positive, administer HBIG to infants &gt;2,000 grams as soon as possible, but no later than 7 days of age.</td>
<td>- Age 2–4 years with history of asthma or wheezing</td>
</tr>
<tr>
<td><strong>Routine series</strong></td>
<td></td>
<td>- Immunocompromised due to any cause (including malignancies and HIV infection)</td>
</tr>
<tr>
<td></td>
<td>3-dose series at 0, 1–2, 6–18 months (use monovalent HepB vaccine for doses administered before age 6 weeks)</td>
<td>- Anatomical or functional asplenia</td>
</tr>
<tr>
<td></td>
<td>Infants who did not receive a birth dose should begin the series as soon as feasible (see Table 2).</td>
<td>- Close contacts or caregivers of severely immunosuppressed persons who require a protected environment</td>
</tr>
<tr>
<td></td>
<td>Administration of a combination vaccine containing HepB is used after the birth dose.</td>
<td>- Pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Cochlear implant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Cerebrospinal fluid-orthopneumal communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Children less than age 2 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Received influenza antiviral medications oseltamivir or zanamivir within the previous 48 hours, parivirin within the previous 5 days, or baloxavir within the previous 17 days</td>
</tr>
</tbody>
</table>

---

**Notes:**

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021.
Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, 2020-2021 and Selected Previous Seasons

†These seasons did not have a week 53, so the week 53 value is an average of week 52 and week 1.

https://www.cdc.gov/flu/weekly/index.htm
2021-2022 US Egg-based Influenza Vaccine Strains

Trivalent
- A/Victoria/2570/2019 (H1N1)pdm09-virus
- A/Cambodia/e0826360/2020 (H3N2)-like virus
- B/Washington/02/2019 (Victoria lineage)-like virus

Quadrivalent
- Adds B/Phuket/3073/2013 (Yamagata lineage)-like virus

2 strain changes from last season
Some children under the age of 9 may require 2 doses of the flu vaccine.
Meningococcal ACWY Vaccine Updates

- Recommendations for use of newly licensed MenACWY-TT (MenQuadfi) for preventing disease attributed to meningococcal serogroups A, C, W, and Y.

- Recommendations for catch-up vaccination with MenACWY-CRM (Menveo) in infants who received dose 1 at age 3–6 months.

Menveo catch-up revised

MenQuadfi added to list for routine, catch-up vaccination, and special situations
# Two MenB Vaccines

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age Group</th>
<th>Recommended Vaccination Schedule</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bexsero</strong></td>
<td>10–25 yrs, at increased risk</td>
<td>2 dose series (1 month apart)</td>
<td>Intramuscular</td>
</tr>
<tr>
<td><em>(MenB-4C)</em></td>
<td></td>
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</tr>
<tr>
<td><strong>Trumenba</strong></td>
<td>10–25 yrs, at increased risk</td>
<td>2 dose series (6 months apart) 3 dose series (0,2,6 months)</td>
<td>Intramuscular</td>
</tr>
<tr>
<td><em>(MenB-FHbp)</em></td>
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</tr>
</tbody>
</table>

Shared Clinical Decision-Making

- Patient/parents/family and provider discuss potential benefits and come to a personalized decision together.

- CDC/ACIP has 4 such vaccine recommendations:
  - Meningococcal B (MenB) for adolescents and young adults aged 16–23 years
  - Hepatitis B (Hep B) for adults 60 years and older with diabetes
  - Human Papillomavirus (HPV) for adults 27–45 years
  - Pneumococcal conjugate vaccination (PCV13) for adults 65 years and older without an immunocompromising condition, cerebrospinal fluid leak, or cochlear implant
MenB Vaccine Recommendations

- Recommendations for persons aged ≥10 years with complement deficiency, complement inhibitor use, or asplenia, or who are microbiologists

- Recommendations for persons aged ≥10 years determined by public health officials to be at an increased risk during an outbreak

Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

Additional Information

COVID-19 Vaccination

ACIP recommends use of COVID-19 vaccines within the scope of the Emergency Use Authorization or Biologic License Application for the particular vaccine. Interim ACIP recommendations for the use of COVID-19 vaccines can be found at www.cdc.gov/vaccines/hcp/acip-recs/vaccuum.html.

- For the latest vaccine recommendations, see the Recommended Adult Immunization Schedule.
- For information on contraindications and precautions for the use of a vaccine, consult the General Best Practice Guidelines for Immunization at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html.

For calculating intervals between doses, 4 weeks = 28 days. Intervals of ≥4 months are determined by calendar months.

Wound management recommendations

- For wounds except clean and minor wounds, administer DTaP vaccine if more than 5 years since last dose of tetanus-toxoid-containing vaccine. For detailed information, see www.cdc.gov/mmwr/volumes/67/rr/rr6702a1.htm.

Special situations

- Wound management in children less than 3 months of age or history of 3 or more doses of tetanus-toxoid-containing vaccine.

Haemophilus influenzae type b vaccination (minimum age: 6 weeks)

Routine vaccination

- ActHIB, Hibrix, or Pentacel: 4-dose series at 2, 4, 6, 12–18 months
- PedvaxHIB: 3-dose series at 2, 4, 6, 12–15 months

Catch-up vaccination

- Dose 1 at age 7–11 months: Administer dose 2 at least 4 weeks later and dose 3 (final dose) at age 12–15 months or 8 weeks after dose 2 (whichever is later).
- Dose 1 at age 12–14 months: Administer dose 2 (final dose) at least 8 weeks after dose 1.
- Dose 1 before age 12 months and dose 2 before age 15 months: Administer dose 3 (final dose) 8 weeks after dose 2.
- 2 doses of PedvaxHIB before age 12 months: Administer dose 3 (final dose) at 12–15 months and at least 8 weeks after dose 2.
- 1 dose administered at age 15 months or older: No further doses needed.
- Unvaccinated at age 15–59 months: Administer 1 dose.
- Previously unvaccinated children 60 months or older who are not considered high risk: Do not require catch-up vaccination.
- For other catch-up guidance, see Table 2.

Diphtheria, tetanus, and pertussis (DTaP) vaccination (minimum age: 6 weeks [4 years for Kinrix or Quadracel])

Routine vaccination

- 5-dose series at 2, 4, 6, 15–18 months, 4–6 years
- Prospectively: Dose 4 may be administered as early as age 12 months if at least 6 months have elapsed since dose 3.
- Retrospectively: A 4th dose that was inadvertently administered as early as age 12 months may be counted if at least 4 months have elapsed since dose 3.

Catch-up vaccination

- Dose 5 is not necessary if dose 4 was administered at age 4 years or older and at least 6 months after dose 3.
- For other catch-up guidance, see Table 2.

Special situations

- Chemotherapy or radiation treatment: 12–59 months:
  - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.
  - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.
- Doses administered within 14 days of starting therapy or during therapy should be repeated at least 3 months after therapy completion.
- Hematopoietic stem cell transplant (HSCT): 3-dose series 4 weeks apart starting 6 to 12 months after successful transplant, regardless of Hib vaccination history.
- Congenital asplenia (including sickle cell disease):
  - 1 dose before age 12 months: 2 doses, at least 8 weeks apart.
  - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.
- Unvaccinated persons age 5 years or older
  - 1 dose.
- Elective splenectomy:
  - Unvaccinated persons age 15 months or older
  - 1 dose (preferably at least 14 days before procedure).
- HIV infection: 12–59 months:
  - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.
  - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.
- Unvaccinated persons age 5–18 years
  - 1 dose.
- Immunoglobulin deficiency, early component complement deficiency: 12–59 months:
  - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart.
  - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose.

*Unvaccinated = Less than routine series (through age 14 months) OR no doses (age 15 months or older)
Notes
Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

For vaccination recommendations for persons ages 19 years or older, see the Recommended Adult Immunization Schedule, 2021.

Additional Information

COVID-19 Vaccination
ACIP recommends use of COVID-19 vaccines within the scope of the Emergency Use Authorization or Biologic License Application for the particular vaccine. Interim ACIP recommendations for the use of COVID-19 vaccines can be found at www.cdc.gov/vaccines/hcp/acip-recs/

- Consult relevant ACIP statements for detailed recommendations at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For information on contraindications and precautions for the use of a vaccine, consult the General Best Practice Guidelines for Immunization at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html.
- For calculating intervals between doses, 4 weeks = 28 days.
- Within a number range (e.g., 12–18), a dash (–) should be read as “through.”
- Vaccine doses administered ≤4 days before the minimum age or interval are considered valid. Doses of any vaccine administered ≥5 days earlier than the minimum age or minimum interval should not be counted as valid and should be repeated as age appropriate. The repeat dose should be spaced after the invalid dose by the recommended minimum interval.
- For further details, see Table 3-1, Recommended and minimum ages and intervals between vaccine doses, in General Best Practice Guidelines for Immunization at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timing.html.
- Information on travel vaccination recommendations is available at www.cdc.gov/travel/.
- For information about vaccination in the setting of a vaccine-preventable disease outbreak, contact your state or local health department.
- The National Vaccine Injury Compensation Program (VICP) is a no-fault alternative to the traditional legal system for resolving vaccine injury claims. All routine child and adolescent vaccines are covered by VICP except for pneumococcal polysaccharide vaccine (PPSV23). For more information, see www.hrsa.gov/vaccinecompensation/index.html.

Diphtheria, tetanus, and pertussis (DTaP) vaccination (minimum age: 6 weeks [4 years for Kinrix or Quadracel])

Routine vaccination
- 5-dose series at 2, 4, 6, 15–18 months, 4–6 years
  - Prospective: Dose 4 may be administered as early as age 12 months if at least 6 months have elapsed since dose 3.
  - Retrospectively: A 4th dose that was inadvertently administered as early as age 12 months may be counted if at least 4 months have elapsed since dose 3.

Catch-up vaccination
- Dose 5 is not necessary if dose 4 was administered at age 4 years or older and at least 6 months after dose 3.
- For other catch-up guidance, see Table 2.

Special situations
- Wound management in children less than age 7 years with history of 3 or more doses of tetanus-toxoid-containing vaccine: For all wounds except clean and minor wounds, administer DTaP if more than 5 years since last dose of tetanus-toxoid-containing vaccine. For detailed information, see www.cdc.gov/mmwr/volumes/67/rr/rr6702a1.htm.

Haemophilus influenzae type b vaccination (minimum age: 6 weeks)

Routine vaccination
- ActHIB, Hibexis, or Pentacel: 4-dose series at 2, 4, 6, 12–15 months
- PedvaxHIB: 3-dose series at 2, 4, 12–15 months

Catch-up vaccination
- Dose 1 at age 7–11 months: Administer dose 2 at least 4 weeks later and dose 3 (final dose) at age 12–15 months or 8 weeks after dose 2 (whichever is later).
- Dose 1 at age 12–14 months: Administer dose 2 (final dose) at least 8 weeks after dose 1.
- Dose 1 before age 12 months and dose 2 before age 15 months: Administer dose 3 (final dose) 8 weeks after dose 2.
- 2 doses of PedvaxHIB before age 12 months: Administer dose 3 (final dose) at least 3 months after dose 2.
- 1 dose administered at age 15 months or older: No further doses needed
- Unvaccinated at age 15–59 months: Administer 1 dose.
- Previously unvaccinated children 60 months or older who are not considered high risk: Do not require catch-up vaccination
- For other catch-up guidance, see Table 2.

- Chemotherapy or radiation treatment: 12–59 months
  - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart
  - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose
  - Doses administered within 14 days of starting therapy or during therapy should be repeated at least 3 months after therapy completion.

- Hematopoietic stem cell transplant (HSCT): 1–3 dose series 4 weeks apart starting 6 to 12 months after successful transplant, regardless of Hib vaccination history.
- Anatomic or functional asplenia (including sickle cell disease): 12–59 months
  - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart
  - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose
- Unvaccinated persons age 5 years or older
  - 1 dose
- Elective splenectomy: Unvaccinated persons age 15 months or older
  - 1 dose (preferably at least 14 days before procedure)
- HIV infection: 12–59 months
  - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart
  - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose
- Unvaccinated persons age 5–18 years
  - 1 dose
- Immunoglobulin deficiency, early component complement deficiency: 12–59 months
  - 1 dose
- For further details, see Table 2.

Catch up vaccination when no further dose is needed
### Hepatitis A vaccination
(minimum age: 12 months for routine vaccination)

**Routine vaccination**
- 2-dose series (minimum interval: 6 months) beginning at age 12 months
- Unvaccinated persons through age 18 years should complete a 2-dose series (minimum interval: 6 months).
- Persons who previously received 1 dose at age 12 months or older should receive 2 doses at least 6 months after dose 1.
- Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, Twinrix® as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 1, and 6 months, and 21-30 days, followed by a booster dose at 12 months).

### Twinrix 4-dose series clarification

### International travel
- Persons traveling to or working in countries with high or intermediate endemic hepatitis A (www.cdc.gov/travel/):
  - Infants age 6–11 months: 1 dose before departure; revaccinate with 2 doses, separated by at least 6 months, between age 12–23 months.
  - Unvaccinated age 12 months or older: Administer dose 1 as soon as travel is considered.

### Hepatitis B vaccination
(minimum age: birth)

**Birth dose (monovalent HepB vaccine only)**
- Mother is HepBAg-negative: 1 dose within 24 hours of birth for all medically stable infants ≥2,000 grams. Infants <2,000 grams: Administer 1 dose at chronological age 1 month or hospital discharge (whichever is earlier and even if weight is still <2,000 grams).
- Mother is HepBAg-positive:
  - Administer HepB vaccine and hepatitis B immune globulin (HBIG) (in separate limbs) within 12 hours of birth, regardless of birth weight. For infants <2,000 grams, administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
  - Test for HBsAg and anti-HBs at age 9–12 months. If HepB series is delayed, test 1–2 months after final dose.
- Mother’s HBsAg status is unknown:
  - Administer HepB vaccine within 12 hours of birth, regardless of birth weight.
  - For infants <2,000 grams, administer HBIG in addition to HepB vaccine in (in separate limbs) within 12 hours of birth. Administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
  - Determine mother’s HBsAg status as soon as possible. If mother is HepBAg-positive, administer HBIG to infants ≤2,000 grams as soon as possible, but no later than 7 days of age.

### Human papillomavirus vaccination
(minimum age: 9 years)

**Routine and catch-up vaccination**
- HPV vaccination routinely recommended at age 11–12 years (can start at age 9 years) and catch-up HPV vaccination recommended for all persons through age 18 years if not adequately vaccinated.
- 2- or 3-dose series depending on age at initial vaccination:
  - Age 9–14 years at initial vaccination: 2-dose series at 0, 6–12 months (minimum interval: 5 months; repeat dose administered too soon)
  - Age 15 years or older at initial vaccination: 3-dose series at 0, 1–2 months, 6 months (minimum interval: dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 12 weeks / dose 1 to dose 3: 3 months; repeat dose if administered too soon).
  - Interrupted schedules: If vaccination schedule is interrupted, the series does not need to be restarted.
  - No additional dose recommended after completing series with recommended dosing intervals using any HPV vaccine.

### Special situations
- Immunocompromising conditions, including HIV infection: 3-dose series as above.
- History of sexual abuse or assault: Start at age 9 years.
- Pregnancy: HPV vaccination not recommended until after pregnancy; no intervention needed if vaccinated while pregnant; pregnancy testing not needed before vaccination.

### Influenza vaccination
(minimum age: 6 months [IIV], 2 years [LAIV4], 18 years [recombinant influenza vaccine, RIV4])

**Routine vaccination**
- Use any influenza vaccine appropriate for age and health status annually:
  - 2 doses, separated by at least 4 weeks, for children age 6 months–8 years who have received fewer than 2 influenza vaccine doses before July 1, 2020, or whose influenza vaccination history is unknown (administer dose 2 even if the child turns 9 between receipt of dose 1 and dose 2).
  - 1 dose for children age 6 months–8 years who have received at least 2 influenza vaccine doses before July 1, 2020.
  - 1 dose for all persons age 9 years or older.

**For the 2021–22 season, see the 2021–22 ACIP influenza vaccine recommendations.**
<table>
<thead>
<tr>
<th>Notes</th>
<th>Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis A vaccination</td>
<td>&lt;br&gt;<strong>Minimum age:</strong> 12 months for routine vaccination &lt;br&gt;<strong>Routine vaccination:</strong> 2-dose series (minimum interval: 6 months) beginning at age 12 months &lt;br&gt;<strong>Catch-up vaccination:</strong> Unvaccinated persons through age 18 years should complete a 2-dose series (minimum interval: 6 months). Persons who previously received 1 dose at age 12 months or older should receive dose 2 at least 6 months after dose 1. Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, Twinrix&lt;sup&gt;®&lt;/sup&gt;, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 1, 6, and 12 months) followed by a booster dose at 12 months.</td>
</tr>
<tr>
<td><strong>International travel:</strong></td>
<td>&lt;br&gt;Persons traveling to or working in countries with high or intermediate endemic hepatitis A. (<a href="http://www.cdc.gov/travel/">www.cdc.gov/travel/</a>): &lt;br&gt;- Infants age 6–11 months: 1 dose before departure; revaccinate with 2 doses, separated by at least 6 months, between age 12–23 months. &lt;br&gt;- Unvaccinated age 12 months or older: Administer dose 1 as soon as travel is considered.</td>
</tr>
<tr>
<td>Twinrix 4-dose series clarification</td>
<td>&lt;br&gt;Birth dose for &lt;2000 grams; HBsAg-negative mom</td>
</tr>
<tr>
<td><strong>Hepatitis B vaccination</strong></td>
<td>&lt;br&gt;<strong>Minimum age:</strong> birth &lt;br&gt;<strong>Birth dose (monovalent HepB vaccine only):</strong> &lt;br&gt;- Mother is HBsAg-negative: 1 dose within 24 hours of birth for all medically stable infants ≥2000 grams. Infants &lt;2000 grams: Administer 1 dose at chronological age 1 month or hospital discharge (whichever is earlier and even if weight is still &lt;2000 grams). &lt;br&gt;- Mother’s HBsAg status is unknown: &lt;br&gt;- Administer HepB vaccine and hepatitis B immune globulin (HBIG) in separate limbs) within 12 hours of birth, regardless of the birth weight. For infants &lt;2000 grams, administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month. Test for HBsAg and anti-HBs at age 9–12 months. If HepB series is delayed, test for HBsAg before dose 1. &lt;br&gt;- Mother’s HBsAg status is positive: &lt;br&gt;- Administer HepB vaccine in 12 hours of birth, regardless of the birth weight. For infants &lt;2000 grams, administer HBIG in addition to HepB vaccine in separate limbs) within 12 hours of birth. Administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month. Determine mother’s HBsAg status as soon as possible. If mother is HBsAg-positive, administer HBIG to infants ≥2000 grams as soon as possible, but no later than 7 days of age.</td>
</tr>
<tr>
<td><strong>Routine series:</strong></td>
<td>&lt;br&gt;3-dose series at 0, 1–2, 6–18 months (use monovalent HepB vaccine for doses administered before age 6 weeks). Infants who did not receive a birth dose should begin the series as soon as possible (see Table 2). Administration of 4 doses is permitted when a combination vaccine containing HepB is used after the birth dose.</td>
</tr>
<tr>
<td><strong>Minimum age:</strong> for the final (3rd or 4th) dose: 24 weeks &lt;br&gt;<strong>Minimum intervals:</strong> dose 1 to dose 2: 4 weeks; dose 2 to dose 3: 8 weeks; dose 1 to dose 3: 16 weeks (when 4 doses are administered, substitute “dose 4” for “dose 3” in these calculations).</td>
<td></td>
</tr>
<tr>
<td><strong>Catch-up vaccination:</strong></td>
<td>&lt;br&gt;Unvaccinated persons who should complete a 3-dose series at 0, 1–2, and 6 months. Adolescents age 11–15 years may use an alternative 2-dose schedule with at least 4 months between doses (adult formulation Recombivax HB&lt;sup&gt;®&lt;/sup&gt; only). Adolescents age 16–18 years or older may receive a 2-dose series of HepB (Heplisav-B&lt;sup&gt;®&lt;/sup&gt;) at least 4 weeks apart. Adolescents age 16–18 years or older may receive the combined HepA and HepB vaccine, Twinrix&lt;sup&gt;®&lt;/sup&gt;, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 1, 6, and 12 months) followed by a booster dose at 12 months. For other catch-up guidance, see Table 2.</td>
</tr>
<tr>
<td><strong>Special situations:</strong></td>
<td>&lt;br&gt;Revaccination is generally not recommended for persons with a normal immune status who were vaccinated as infants, children, adolescents, or adults. Revaccination may be recommended for certain populations, including: &lt;br&gt;- Infants born to HBsAg-positive mothers &lt;br&gt;- Hemodialysis patients &lt;br&gt;- Other immunocompromised persons.</td>
</tr>
<tr>
<td><strong>Influenza vaccination</strong></td>
<td>&lt;br&gt;<strong>Minimum age:</strong> 6 months ([IIV], 2 years [LAIV4], 18 years [recombinant influenza vaccine, RIV4]). <strong>Routine vaccination:</strong> Use any influenza vaccine appropriate for age and health status annually: &lt;br&gt;- 2 doses, separated by at least 4 weeks, for children age 6 months–8 years who have received fewer than 2 influenza vaccine doses before July 1, 2020, or whose influenza vaccine history is unknown (administer dose 2 even if the dose 2 interval is not completed). &lt;br&gt;- LAIV4 should not be used in persons with the following conditions or situations: &lt;br&gt;- History of severe allergic reaction to a previous dose of any influenza vaccine or to any vaccine component (excluding egg, see details above). &lt;br&gt;- Receiving aspirin or salicylate-containing medications &lt;br&gt;- Age 2–4 years with history of asthma or wheezing &lt;br&gt;- Immunocompromised due to any cause (including medications and HIV infection) &lt;br&gt;- Anatomic or functional asplenia &lt;br&gt;- Close contacts or caregivers of severely immunosuppressed persons who require a protected environment &lt;br&gt;- Pregnancy &lt;br&gt;- Cochlear implant &lt;br&gt;- Cerebrospinal fluid-oropharyngeal communication &lt;br&gt;- Children less than age 2 years &lt;br&gt;- Received influenza antiviral medications oseltamivir or zanamivir within the previous 48 hours, peramivir within the previous 5 days, or baloxavir within the previous 17 days.</td>
</tr>
</tbody>
</table>
Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

Hepatitis A vaccination (minimum age: 12 months for routine vaccination)

- **Routine vaccination**
  - 2-dose series (minimum interval: 6 months) beginning at age 12 months

- **Catch-up vaccination**
  - Unvaccinated persons through age 18 years should complete a 2-dose series (minimum interval: 6 months).
  - Persons who previously received 1 dose at age 12 months or older should receive dose 2 at least 6 months after dose 1.
  - Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, Twinrix, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 1, 7, and 21–30 days) followed by a booster dose at 12 months.

International travel

- Persons traveling to or working in countries with high or intermediate endemic hepatitis A (www.cdc.gov/travel/)
  - Infants age 6–11 months: 1 dose before departure; revaccinate with 2 doses, separated by at least 6 months, between age 12–3 months.
  - Unvaccinated age 12 months or older: Administer dose 1 as soon as travel is considered.

Hepatitis B vaccination (minimum age: birth)

- **Birth dose (monovalent HepB vaccine only)**
  - Mother is HBsAg-negative: 1 dose within 24 hours of birth for all medically stable infants >2,000 grams. Infants <2,000 grams: Administer 1 dose at chronological age 1 month or hospital discharge (whichever is earlier and even if weight is still <2,000 grams).
  - Mother is HBsAg-positive:
    - Administer HepB vaccine and hepatitis B immune globulin (HBIG) (in separate limbs) within 12 hours of birth, regardless of birthweight. For infants <2,000 grams, administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
    - Test for HBsAg and anti-HBs at age 9–12 months. If HepB series is delayed, test 1–2 months after final dose.
  - Mother’s HBsAg status is unknown:
    - Administer HepB vaccine within 12 hours of birth, regardless of birthweight.
    - For infants <2,000 grams, administer HBIG in addition to HepB vaccine (in separate limbs) within 12 hours of birth. Administer 3 additional doses of vaccine (total of 4 doses) beginning at age 1 month.
    - Determine mother’s HBsAg status as soon as possible. If mother is HBsAg-positive, administer HBIG to infants ≥2,000 grams as soon as possible, but no later than 7 days of age.

Routine series

- 3-dose series at 0, 1–2, 6–18 months (use monovalent HepB vaccine for doses administered before age 6 weeks)
  - Infants who did not receive a birth dose should begin the series as soon as feasible (see Table 2).
  - Administration of 4 doses is permitted when a combination vaccine containing HepB is used after the birth dose.

Human papillomavirus vaccination (minimum age: 9 years)

- **Routine and catch-up vaccination**
  - If vaccination routinely recommended at age 11–12 years (can start at age 9 years) and catch-up HPV vaccination recommended for all persons through age 18 years if not adequately vaccinated
  - 2- or 3-dose series depending on age at initial vaccination:
    - Age 9–14 years at initial vaccination: 2-dose series at 0, 6–12 months minimum interval: 5 months; repeat dose if administered too soon.
    - Age 15 years or older at initial vaccination: 3-dose series at 0, 1–2 months, 6 months (minimum intervals: dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 12 weeks / dose 1 to dose 3: 5 months; repeat dose if administered too soon).

- **Interrupted schedule**: If vaccination schedule is interrupted, the series does not need to be restarted.
- No additional dose recommended after completing series with recommended dosing intervals using any HPV vaccine.

Special situations

- Immunocompromising conditions, including HIV infection: 3-dose series as above
- History of sexual abuse or assault: Start at age 9 years
- Pregnancy: HPV vaccination not recommended until after pregnancy; no additional needed if vaccinated while pregnant; pregnancy testing not needed before vaccination

Influenza vaccination (minimum age: 6 months [IIV], 2 years [LAIV4], 18 years [recombinant influenza vaccine, RIV4])

- **Routine vaccination**
  - Use any influenza vaccine appropriate for age and health status annually.
  - 2 doses, separated at least 4 weeks, for children age 6 months–8 years who have received fewer than 2 influenza vaccine doses before July 1, 2020, or whose influenza vaccination history is unknown (administer dose 2 even if the child turns 9 between receipt of dose 1 and dose 2).
  - 1 dose for children age 6 months–8 years who have received at least 2 influenza vaccine doses before July 1, 2020.
  - 1 dose for all persons age 9 years or older.
- For the 2021–22 season, see the 2021–22 ACIP influenza vaccine recommendations.

Special situations

- Egg allergy, hives only: Any influenza vaccine appropriate for age and health status annually.
- Egg allergy with symptoms other than hives (e.g., angioedema, respiratory distress, need for emergency medical services or epinephrine): Any influenza vaccine appropriate for age and health status annually. If using an influenza vaccine other than Flublok or Flucelvax, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions.
- Severe allergic reactions to vaccines can occur even in the absence of a history of previous allergic reaction. All vaccination providers should be familiar with the office emergency plan and certified in cardiopulmonary resuscitation.
- A previous severe allergic reaction to influenza vaccine is a contraindication to further receipt of any influenza vaccine.
- LAIV4 should not be used in persons with the following conditions or situations:
  - History of severe allergic reaction to a previous dose of any influenza vaccine or to any vaccine component (excluding egg, see details above).
  - Receiving aspirin or salicylate-containing medications.
  - Age <2 to 4 years with history of asthma or wheezing.
- Pregnancy:
  - HPV vaccination not recommended until after pregnancy; no additional needed if vaccinated while pregnant; pregnancy testing not needed before vaccination.

- Children less than age 2 years:
  - Received influenza antiviral medications oseltamivir or zanamivir within the previous 48 hours, peramivir within the previous 5 days, or baloxavir within the previous 17 days

Recommendations for interrupted schedule
Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2021

**Notes**

**Measles, mumps, and rubella vaccination** (minimum age: 12 months for routine vaccination)

**Routine vaccination**
- 2-dose series at 12−15 months, 4−6 years
- Dose 2 may be administered as early as 4 weeks after dose 1.

**Catch-up vaccination**
- Unvaccinated children and adolescents: 2-dose series at least 4 weeks apart
- The maximum age for use of MMRVs is 12 years.

**Special situations**
- **International travel**
  - Infants age 6−11 months: 1 dose before departure; revaccinate with 2-dose series (one 12−15 months for children in high-risk areas) and dose 2 as early as 4 weeks later.
  - Unvaccinated children age 12 months or older: 2-dose series at least 4 weeks apart before departure

**Meningococcal serogroup A, C, W, Y vaccination** (minimum age: 2 months [MenACWY-CRM, Menveo], 9 months [MenACWY-D, Menactra], 2 years [MenACWY-TT, MenQuadfi])

**Routine vaccination**
- 2-dose series at 11−12 years, 16 years

**Catch-up vaccination**
- Age 13−15 years: 1 dose now and booster at age 16−18 years (minimum interval: 8 weeks)
- Age 16−18 years: 1 dose

**Special situations**
- **Anatomic or functional asplenia (including sickle cell disease)**, HIV infection, persistent complement component deficiency, complement inhibitor (e.g., eculizumab, ravulizumab) use:
  - **Menveo**
    - Dose 1 at age 8 weeks; 4-dose series at 2, 4, 6, 12 months
    - Dose 1 at age 8 weeks; 4-dose series at 2, 4, 6, 12 months (dose 2 and dose 3 if applicable) at least 8 weeks after previous dose until a dose is received at age 7 months or older, followed by an additional dose at least 12 weeks later and after age 12 months
    - Dose 1 at age 7−23 months; 2-dose series (dose 2 at least 8 weeks after dose 1 and after age 12 months)
  - **Menactra**
    - Dose 1 at age 8 weeks; 4-dose series at 2, 4, 6, 12 months
    - Dose 1 at age 8 weeks; 4-dose series at 2, 4, 6, 12 months (dose 2 and dose 3 if applicable) at least 8 weeks after previous dose until a dose is received at age 7 months or older, followed by an additional dose at least 12 weeks later and after age 12 months
    - Dose 1 at age 7−23 months; 2-dose series (dose 2 at least 8 weeks after dose 1 and after age 12 months)

**PPSV23 given at least 8 weeks after completing all PCV13 doses**

**Shared clinical decision-making**
- **Adolescents not at increased risk age 16−23 years (preferred age 16−18 years)** based on shared clinical decision-making:
  - **Bexsero**
    - 2-dose series at least 1 month apart
  - **Trumenba**
    - 2-dose series at least 6 months apart; if dose 2 is administered earlier than 6 months, administer a 3rd dose at least 4 months after dose 2.

**Special situations**
- **Anatomic or functional asplenia (including sickle cell disease)**, persistent complement component deficiency, complement inhibitor (e.g., eculizumab, ravulizumab) use:
  - **Bexsero**
    - 2-dose series at least 1 month apart
  - **Trumenba**
    - 3-dose series at 0, 1−2, 6 months
  - **Bexsero** and **Trumenba** are not interchangeable; the same product should be used for all doses in a series.
  - For **MenB booster dose recommendations** for groups listed under **Special situations** and in an outbreak setting and additional meningococcal vaccination information, see www.cdc.gov/mmwr/volumes/69/rr/rr6909e1.htm.

**Pneumococcal vaccine** (minimum age: 6 months [PCV13], 7 years [PPSV23])

**Routine vaccination with PCV13**
- 4-dose series at 2, 4, 6, 12−15 months

**Catch-up vaccination with PCV13**
- 1 dose for healthy children age 24−59 months with any incomplete PCV13 series
- For other catch-up guidance, see Table 2.

**Special situations**
- **Underlying conditions** below: When both PCV13 and PPSV23 are indicated, administer PCV13 first. PCV13 and PPSV23 should not be administered during same visit.

**Chronic heart disease (particularly congenital heart disease and cardiac failure); chronic lung disease (including asthma treated with high-dose, oral corticosteroids); diabetes mellitus;** Age 2−5 years
- Any incomplete series with:
  - 3 PCV13 doses; 1 dose PCV13 (at least 8 weeks after any prior PCV13 dose)
  - Less than 3 PCV13 doses; 2 doses PCV13 (8 weeks after the most recent dose and administered 8 weeks apart)
- **No history of PPSV23:** 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV13 doses)
- **Age 6−18 years**
  - Any incomplete series with:
    - 3 PCV13 doses; 1 dose PCV13 (at least 8 weeks after any prior PCV13 dose)
    - Less than 3 PCV13 doses; 2 doses PCV13 (8 weeks after the most recent dose and administered 8 weeks apart)
- **No history of PPSV23:** 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV13 doses)

**Cerebrospinal fluid leak, cochlear implant**
- Age 2−5 years
- Any incomplete series with:
  - 3 PCV13 doses; 1 dose PCV13 (at least 8 weeks after any prior PCV13 dose)
  - Less than 3 PCV13 doses; 2 doses PCV13 (8 weeks after the most recent dose and administered 8 weeks apart)
- **No history of PPSV23:** 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV13 doses)

**“High-risk” changed to “Underlying” conditions**
Treat with confidence. Trusted answers from the American Academy of Pediatrics.

Wound management recommendations

- **Rotavirus vaccination** (minimum age: 6 weeks)

- **Routine vaccination**
  - **Rotarix**: 2-dose series at 2 and 4 months
  - **RotaTeq**: 3-dose series at 2, 4, and 6 months

- **Catch-up vaccination**
  - Do not start the series on or after age 15 weeks, 0 days.
  - The maximum age for the final dose is 8 months, 0 days.
  - For other catch-up guidance, see Table 2.

- **Varicella vaccination** (minimum age: 12 months)

- **Routine vaccination**
  - 2-dose series at 12–15 months, 4–6 years

- **Catch-up vaccination**
  - Ensure persons age 7–18 years without evidence of immunity (see MMWR at www.cdc.gov/mmwr/pdf/rr/rr5604.pdf) have a 2-dose series:
    - **Age 7–12 years**: routine interval: 3 months (a dose administered after a 4-week interval may be counted).
    - **Age 13 years and older**: routine interval: 4–8 weeks (minimum interval: 4 weeks)
    - The maximum age for use of MMRV is 12 years.

- **Tetanus, diphtheria, and pertussis (Tdap) vaccination** (minimum age: 11 years for routine vaccination, 7 years for catch-up vaccination)

- **Routine vaccination**
  - **Adolescents age 11–12 years**: 1 dose Tdap
  - **Pregnancy**: 1 dose Tdap during each pregnancy, preferably in early part of gestational weeks 27–36
  - Tdap may be administered regardless of the interval since the last tetanus- and diphtheria-toxoid-containing vaccine.

- **Catch-up vaccination**
  - Adolescents age 13–18 years who have not received Tdap:
    - 1 dose Tdap, then Td or Tdap booster every 10 years
  - Persons age 7–18 years not fully vaccinated with DTaP:
    - 1 dose Tdap as part of the catch-up series (preferably the first dose); if additional doses are needed, use Td or Tdap.
  - Td administered at age 7–10 years:
    - **Children age 7–9 years**: receive Tdap should receive the routine Tdap dose at age 11–12 years.
    - **Children age 10 years**: receive Tdap should not receive the routine Tdap dose at age 11–12 years.
  - DTaP inadvertently administered on or after age 7 years:
    - **Children age 7–9 years**: DTaP may count as part of catch-up series. Administer routine Tdap dose at age 11–12 years.
    - **Children age 10–18 years**: Count dose of DTaP as the adolescent Tdap booster.
  - For other catch-up guidance, see Table 2.

Special situations

- **Wound management**
COVID mRNA Vaccines

**Pfizer BioNTech**
- 2 doses: 0 and 21 days
- Efficacy: 95% (7 d after dose 2)
  - 90% vs severe disease
- Reactions after vaccine
- No serious adverse events

**Moderna**
- 2 doses: 0 and 28 days
- Efficacy: 94% (7 d after dose 2)
  - 100% vs severe disease
- Reactions after vaccine
- No serious adverse events
COVID Replication-incompetent Virus Vector Vaccine
Janssen/J+J

- 1 dose
- Vaccine effectiveness against deaths due to COVID-19: 100% (>14 d)
- Efficacy for hospitalization: 100% (>28 d)
- Efficacy for severe disease: 83.5% (>28 d)
- Reactions after vaccine
- No serious adverse events
<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Manufacturer</th>
<th>Vaccine type</th>
<th>FDA status</th>
<th>FDA age indication</th>
<th>Dose number and interval</th>
<th>Presentation</th>
<th>Comments</th>
<th>Further information</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRNA162b2</td>
<td>Pfizer/BioNTech</td>
<td>mRNA</td>
<td>EUA 12/11/2020</td>
<td>16 years and older</td>
<td>2 doses; (0, 21 days)</td>
<td>multidose vials</td>
<td>storage - 70°C; -2°C to 1°C</td>
<td><a href="https://www.cdc.gov/mmwr/volumes/69/wr/mm6904e2.htm">https://www.cdc.gov/mmwr/volumes/69/wr/mm6904e2.htm</a></td>
</tr>
<tr>
<td>mRNA-1273</td>
<td>Moderna</td>
<td>mRNA</td>
<td>EUA 12/18/2020</td>
<td>18 years and older</td>
<td>2 doses; (0, 28 days)</td>
<td>multidose vials</td>
<td>storage -20°C; -6°C to 8°C</td>
<td><a href="https://www.cdc.gov/mmwr/volumes/69/wr/mm6905e1.htm">https://www.cdc.gov/mmwr/volumes/69/wr/mm6905e1.htm</a></td>
</tr>
<tr>
<td>AZD1222</td>
<td>U Oxford/AstraZeneca</td>
<td>non-replicating adenovirus vector</td>
<td>not submitted to FDA</td>
<td>N/A</td>
<td>2 doses (0, 28 days)</td>
<td>multidose vials (10 doses)</td>
<td>Phase 3 study complete; licensed in UK; storage 2°C-8°C x 3 months</td>
<td><a href="https://clinicaltrials.gov/ct2/show/NCT04519746">https://clinicaltrials.gov/ct2/show/NCT04519746</a></td>
</tr>
<tr>
<td>Ad26COV51</td>
<td>Janssen/Johnson &amp; Johnson</td>
<td>non-replicating adenovirus vector</td>
<td>EUA 2/27/21</td>
<td>18 years and older</td>
<td>1 dose</td>
<td>Multidose vials (5 doses/0.5 mL per dose)</td>
<td>2°C - 8°C x 3 months; Storage -25°C to -15°C frozen x 24 months</td>
<td><a href="https://www.cdc.gov/mmwr/volumes/70/wr/mm7009e4.htm?s_cid=mm7009e4_w">https://www.cdc.gov/mmwr/volumes/70/wr/mm7009e4.htm?s_cid=mm7009e4_w</a> <a href="https://www.td.gov/media/146330/download">https://www.td.gov/media/146330/download</a></td>
</tr>
</tbody>
</table>

Table Updated: 3/4/21

Red Book® Online
1. Text message check-ins from CDC (daily 1st week; weekly through 6 weeks; then 3, 6, and 12 mo)

Vaccine recipient completes web survey.

2. Clinically important event(s) reported

✓ Received medical care

Call center

3. A Vaccine Adverse Event Reporting System (VAERS) customer service representative conducts active telephone follow-up on a medically attended health impact event and takes a report if appropriate.
VAERS is the nation’s early warning system for vaccine safety

Vaccine Adverse Event Reporting System

co-managed by CDC and FDA

http://vaers.hhs.gov
Vaccine Adverse Event Reporting System (VAERS)

**Strengths**
- National data
- Rapidly detects safety signals
- Can detect rare adverse events
- Data available to public

**Limitations**
- Reporting bias
- Inconsistent data quality and completeness of information
- Lack of unvaccinated comparison group
- Not designed to assess causality

- **VAERS accepts all reports from everyone** regardless of the plausibility of the vaccine causing the event or the clinical seriousness of the event.

- As a hypothesis generating system, VAERS identifies potential vaccine safety concerns that can be studied in more robust data systems.
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CISA
Clinical Immunization Safety Assessment (CISA) Project

7 participating medical research centers with vaccine safety experts

- clinical consult services†
- clinical research

†More information about clinical consults available at http://www.cdc.gov/vaccinesafety/Activities/CISA.html
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VSD
Vaccine Safety Datalink

9 participating integrated healthcare organizations data on over 12 million persons per year
Types of information in VSD

- birth and death certificate information & family linkage
- procedure codes
- hospital discharge diagnosis codes
- enrollment and demographics
- immunization records
- outpatient and clinic visits
- emergency room visits
- diagnosis codes
- charts and electronic health records

linked by study IDs

Images created by Wilson Joseph, Megan Mitchell, Ananth, and Iga from the noun project
REPORT OF THE COMMITTEE ON IMMUNIZATION PROCEDURES OF THE AMERICAN ACADEMY OF PEDIATRICS

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January, 1938

8 pages in 1938
Red Book®
Report of the Committee on Infectious Diseases

Immunization Schedules
Recommended immunization schedules and catch-up schedules for infants, children, adolescents, and young adults.

Visual Library
More than 2,500 infectious disease images for use in diagnosis and presentations, including clinical manifestations, disease vectors, and etiology.

Vaccine Status Table
Current information about recently submitted, licensed, and recommended vaccines and biologics, including status of the FDA licensure process and related AAP/CDC recommendations.

Influenza Resources
A comprehensive list of influenza resources for vaccine guidance, prevention, treatment, payment, policies, news, and other information pertaining to influenza for infants, children, adolescents, and young adults.

AAP News articles on COVID-19
- AAP: Limit visitors to hospitalized children during COVID-19 pandemic 7/1/20
- AAP updates child care guidance on sanitizing spaces, screening staff 6/29/20
- AAP interim guidance on school re-entry focuses on mitigating COVID-19 risks 6/26/20
- More

CDC Webinar - Acute Flaccid Myelitis: What Healthcare Providers Need to Know in 2020
### Table 1: Status of Recently** Submitted, Licensed, and Recommended Vaccines & Biologics

Click on disease names for current Red Book® recommendations. General Best Practice Guidelines for Immunization - [cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html](https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html)

Vaccine supply shortages may result in changes to recommendations. Please consult [cdc.gov/vaccines/vac-gen/shortages/default.htm](https://www.cdc.gov/vaccines/vac-gen/shortages/default.htm)

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Abbreviation (Brand Name)</th>
<th>Manufacturer</th>
<th>FDA licensure</th>
<th>FDA age indications***</th>
<th>CDC/AAP recommendation</th>
<th>Further Information****</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dengue</td>
<td>N/A (Dengvaxia®)</td>
<td>Sanofi</td>
<td>May 2019</td>
<td>9 through 16 years of age who have serologic evidence of prior infection</td>
<td>Pending</td>
<td><a href="https://www.cdc.gov/dengue/prevention/dengue-vaccine.html">https://www.cdc.gov/dengue/prevention/dengue-vaccine.html</a></td>
</tr>
<tr>
<td>DTaP/IPV/Hep B/Hib</td>
<td>DTaP/IPV/Hep B/Hib (Vaxelise®)</td>
<td>Sanofi-Merck</td>
<td>December 2018</td>
<td>6 weeks through 4 years of age</td>
<td>Pending</td>
<td>Vaccine not available until 2021</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>HepA (Havrix®; VAQTA®)</td>
<td>GSK; Merck</td>
<td>n/a</td>
<td>12 months of age and older</td>
<td>a) Routine catch up vaccination for all children 1 through 18 years of age</td>
<td><a href="https://www.cdc.gov/mmwr/volumes/69/rrf6905a1.htm">https://www.cdc.gov/mmwr/volumes/69/rrf6905a1.htm</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b) HIV infection and homelessness are indications for vaccination for all persons 1 year of age and older</td>
<td><a href="https://www.cdc.gov/mmwr/volumes/69/rrf6905a1.htm">https://www.cdc.gov/mmwr/volumes/69/rrf6905a1.htm</a></td>
</tr>
</tbody>
</table>
| Human Papillomavirus      | HPV (Gardasil®)           | Merck        | October 2018  | 27 years through 45 years of age | a) Routine immunization of both men and women through age 26 years.  
b) Immunization of adults 27 through 45 years of age based on shared clinical decision making. | [https://www.cdc.gov/mmwr/volumes/68/rr/mm6832a3.htm](https://www.cdc.gov/mmwr/volumes/68/rr/mm6832a3.htm) |
| Influenza                 |                           | varies       | See Influenza Vaccine Table |                        | See Influenza Vaccine Table |
| Japanese Encephalitis     | N/A (Ixaro®)              | Valneva Austria GmbH | October 2018 (accelerated schedule) and April 2018 (pediatric booster dose) | 2 months of age and older | a) Adults 18 years of age and older: accelerated primary series with dose #2 7-28 days after dose #1  
b) Adults and children 2 months of age and older: Booster dose should be given 1 year or more after completion of the primary series if ongoing exposure | [https://www.cdc.gov/mmwr/volumes/68/rr/mm6802a1.htm](https://www.cdc.gov/mmwr/volumes/68/rr/mm6802a1.htm) |
| Meningococcal ACWY       | MenACWY-TT (Menquadrifi)  | Sanofi Pasteur | April 23, 2020 | 2 years of age and older | a) Routine vaccination for adolescents aged 11 or 12 years, with a booster dose at age 16 years.  
b) Routine vaccination for persons aged ≥2 years at increased risk for meningococcal disease caused by serogroups A, C, W, or Y | [https://www.cdc.gov/mmwr/volumes/69/rr/mm6909a1.htm](https://www.cdc.gov/mmwr/volumes/69/rr/mm6909a1.htm) |
| Meningococcal Group B     | MenB-FHbp (Trumenba®); Men B-4C (Bexero®) | PfizerWyeth; GSK | April 2016; Jan 2015 | 10 years through 25 years of age | a) MenB series for adolescents and young adults aged 16–23 years on the basis of shared clinical decision-making  
b) Routine use among persons aged ≥10 years who are at increased risk for serogroup B meningococcal disease  
c) Booster dose 1 year after primary series for those at high risk (includes individuals in outbreak settings) | [https://www.cdc.gov/mmwr/volumes/69/rr/mm6909a1.htm](https://www.cdc.gov/mmwr/volumes/69/rr/mm6909a1.htm) |
| PCV13                     | PCV13 (Prevenar 13®)      | Wyeth        | n/a           | 6 weeks of age and older | Immunization of adults 65 years of age and older based on shared decision making rather than routine | [https://www.cdc.gov/mmwr/volumes/68/rr/mm6846a5.htm](https://www.cdc.gov/mmwr/volumes/68/rr/mm6846a5.htm) |
| Tdap                      | Tdap (Adacel®)            | Sanofi Pasteur | Jan 2019      | 10 through 64 years of age, booster dose ≥ 8 years prior to dose | Tdap may now be substituted for Td for the decennial tetanus-diphtheria booster, for wound prophylaxis, and for catch-up immunization. | [https://www.cdc.gov/mmwr/volumes/68/rr/mm6903a5.htm](https://www.cdc.gov/mmwr/volumes/68/rr/mm6903a5.htm) |
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