Recommended Immunization Schedule for
Children and Adolescents Aged 18 Years or Younger, UNITED STATES, 2017

This schedule includes recommendations in effect as of January 1, 2017. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at [www.cdc.gov/vaccines/hcp/acip-recs/index.html](http://www.cdc.gov/vaccines/hcp/acip-recs/index.html). Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online ([www.vaers.hhs.gov](http://www.vaers.hhs.gov)) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online ([www.cdc.gov/vaccines/hcp/admin/contraindications.html](http://www.cdc.gov/vaccines/hcp/admin/contraindications.html)) or by telephone (800-CDC-INFO [800-232-4636]).

The Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger are approved by the

- **Advisory Committee on Immunization Practices**
  ([www.cdc.gov/vaccines/acip](http://www.cdc.gov/vaccines/acip))

- **American Academy of Pediatrics**
  ([www.aap.org](http://www.aap.org))

- **American Academy of Family Physicians**
  ([www.aafp.org](http://www.aafp.org))

- **American College of Obstetricians and Gynecologists**
  ([www.acog.org](http://www.acog.org))
Figure 1. Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger—United States, 2017.

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.

To determine minimum intervals between doses, see the catch-up schedule (Figure 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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<tbody>
<tr>
<td>Hepatitis B (HepB)</td>
<td>1st dose</td>
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<tr>
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<td>1st dose</td>
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<td>3rd dose</td>
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<td>Influenza (IV)</td>
<td>Annual vaccination (IV) 1 or 2 doses</td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>See footnote 8</td>
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<td>Varicella (VAR)</td>
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<td>Meningococcal (Hib-MenCY ≥6 weeks; MenACWY-CRM ≥2 mos; MenACWY-CRM ≥2 mos)</td>
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<td>Tetanus, diphtheria, &amp; acellular pertussis (Tdap: ≥7 yrs)</td>
<td>See footnote 12</td>
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<td>Human papillomavirus (HPV)</td>
<td>See footnote 13</td>
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<td>Meningococcal B</td>
<td>See footnote 14</td>
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<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td>See footnote 15</td>
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NOTE: The above recommendations must be read along with the footnotes of this schedule.
FIGURE 2. Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind—United States, 2017.

The figure 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 Figure 1 and the footnotes that follow.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Minimum Interval Between Doses</th>
<th>Children age 4 months through 6 years</th>
<th>Children and adolescents age 7 through 18 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dose 1 to Dose 2</td>
<td>Dose 2 to Dose 3</td>
<td>Dose 3 to Dose 4</td>
<td>Dose 4 to Dose 5</td>
</tr>
<tr>
<td>Hepatitis B&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Birth</td>
<td>4 weeks</td>
<td>8 weeks (at least 16 weeks after first dose)</td>
<td>Minimum age for the final dose is 24 weeks.</td>
</tr>
<tr>
<td>Rotavirus&lt;sup&gt;2&lt;/sup&gt;</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks&lt;sup&gt;2&lt;/sup&gt;</td>
<td>4 weeks&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Diphtheria, tetanus, and acellular pertussis&lt;sup&gt;3&lt;/sup&gt;</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
<td>6 months</td>
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<tr>
<td>Haemophilus influenzae type b&lt;sup&gt;4&lt;/sup&gt;</td>
<td>6 weeks</td>
<td>4 weeks if first dose was administered before the 1st birthday.</td>
<td>8 weeks (as final dose) if first dose was administered at age 12 through 14 months.</td>
<td>No further doses needed if first dose was administered at age 15 months or older.</td>
</tr>
<tr>
<td>Pneumococcal&lt;sup&gt;5&lt;/sup&gt;</td>
<td>6 weeks</td>
<td>4 weeks if first dose was administered before the 1st birthday.</td>
<td>8 weeks (as final dose for healthy children) if first dose was administered at the 1st birthday or after.</td>
<td>No further doses needed for healthy children if first dose was administered at age 24 months or older.</td>
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<tr>
<td>Inactivated poliovirus&lt;sup&gt;6&lt;/sup&gt;</td>
<td>6 weeks</td>
<td>4 weeks&lt;sup&gt;6&lt;/sup&gt;</td>
<td>4 weeks&lt;sup&gt;6&lt;/sup&gt;</td>
<td>6 months&lt;sup&gt;6&lt;/sup&gt; (minimum age 4 years for final dose)</td>
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<tr>
<td>Measles, mumps, rubella&lt;sup&gt;7&lt;/sup&gt;</td>
<td>12 months</td>
<td>4 weeks</td>
<td>4 weeks</td>
<td>6 months</td>
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<tr>
<td>Varicella&lt;sup&gt;8&lt;/sup&gt;</td>
<td>12 months</td>
<td>3 months</td>
<td>3 months</td>
<td>3 months</td>
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<tr>
<td>Hepatitis A&lt;sup&gt;9&lt;/sup&gt;</td>
<td>12 months</td>
<td>6 months</td>
<td>6 months</td>
<td>6 months</td>
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<tr>
<td>Meningococcal&lt;sup&gt;11&lt;/sup&gt; (Hib-MenCY: ≥6 weeks; MenACWY D: ≥9 mos; MenACWY-CRM: ≥2 mos)</td>
<td>6 weeks</td>
<td>8 weeks&lt;sup&gt;11&lt;/sup&gt;</td>
<td>See footnote 11</td>
<td>See footnote 11</td>
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<tr>
<td>Meningoencephalitis&lt;sup&gt;11&lt;/sup&gt; (MenACWY-CRM: ≥2 mos)</td>
<td>Not Applicable (N/A)</td>
<td>8 weeks&lt;sup&gt;11&lt;/sup&gt;</td>
<td>8 weeks&lt;sup&gt;11&lt;/sup&gt;</td>
<td>8 weeks&lt;sup&gt;11&lt;/sup&gt;</td>
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<tr>
<td>Tetanus, diphtheria, tetanos, diphtherie, and acellular pertussis&lt;sup&gt;12&lt;/sup&gt;</td>
<td>7 years&lt;sup&gt;12&lt;/sup&gt;</td>
<td>4 weeks</td>
<td>4 weeks</td>
<td>6 months if first dose of DTaP/Td was administered before the 1st birthday.</td>
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<tr>
<td>Human papillomavirus&lt;sup&gt;13&lt;/sup&gt;</td>
<td>9 years</td>
<td>Routine dosing intervals are recommended&lt;sup&gt;13&lt;/sup&gt;</td>
<td>Routine dosing intervals are recommended&lt;sup&gt;13&lt;/sup&gt;</td>
<td>6 months if first dose of DTaP/Td was administered before the 1st birthday.</td>
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<tr>
<td>Hepatitis B&lt;sup&gt;12&lt;/sup&gt;</td>
<td>N/A</td>
<td>6 months</td>
<td>6 months</td>
<td>6 months</td>
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<tr>
<td>Varicella&lt;sup&gt;14&lt;/sup&gt;</td>
<td>N/A</td>
<td>3 months if younger than age 13 years.</td>
<td>4 weeks if age 13 years or older.</td>
<td>6 months</td>
</tr>
</tbody>
</table>

NOTE: The above recommendations must be read along with the footnotes of this schedule.
**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>Pregnancy</th>
<th>Immunocompromised status (excluding HIV infection)</th>
<th>HIV infection CD4+ count (cells/μL)</th>
<th>Kidney failure, end-stage renal disease, on hemodialysis</th>
<th>Heart disease, chronic lung disease</th>
<th>CSF leaks/cochlear implants</th>
<th>Asplenia and persistent complement component deficiencies</th>
<th>Chronic liver disease</th>
<th>Diabetes</th>
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<tbody>
<tr>
<td>Hepatitis B</td>
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<td>Rotavirus</td>
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<td>Diphtheria, tetanus, &amp; acellular pertussis (DTaP)</td>
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<td>Hepatitis A</td>
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*Severe Combined Immunodeficiency

**NOTE:** The above recommendations must be read along with the footnotes of this schedule.
Footnotes — Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger, UNITED STATES, 2017

For further guidance on the use of the vaccines mentioned below, see: www.cdc.gov/vaccines/hcp/acip-recs/index.html. For vaccine recommendations for persons 19 years of age and older, see the Adult Immunization Schedule.

Additional information

- For information on contraindications and precautions for the use of a vaccine and for additional information regarding that vaccine, vaccination providers should consult the ACIP General Recommendations on Immunization and the relevant ACIP statement, available online at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For purposes of calculating intervals between doses, 4 weeks = 28 days. Intervals of 4 months or greater are determined by calendar months.
- Vaccine doses administered ≤4 days before the minimum interval are considered valid. Doses of any vaccine administered ≥5 days earlier than the minimum interval or minimum age should not be counted as valid doses 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 1, Recommended ages and intervals between vaccine doses, in MMWR, General Recommendations on Immunization and Reports / Vol. 60 / No. 2, available online at www.cdc.gov/mmwr/pdf/rr/rr6002.pdf.
- Information on travel vaccine requirements and recommendations is available at wwwnc.cdc.gov/travel/.
- The National Vaccine Injury Compensation Program (VICP) is a no-fault alternative to the traditional legal system for resolving vaccine injury petitions. Created by the National Childhood Vaccine Injury Act of 1986, it provides compensation to people found to be injured by certain vaccines. All vaccines within the recommended childhood immunization schedule are covered by VICP except for pneumococcal polysaccharide vaccine (PPSV23). For more information; see www.hrsa.gov/vaccinecompensation/index.html.

1. Hepatitis B (HepB) vaccine. (Minimum age: birth)
   Routine vaccination:
   - Administration of a total of 4 doses of HepB vaccine is permitted when a combination vaccine containing HepB is administered after the birth dose.
   - Administration of a total of 4 doses of HepB vaccine is permitted when a combination vaccine containing HepB is administered after the birth dose.
   - Catch-up vaccination:
     - Unvaccinated persons should complete a 3-dose series.
     - A 2-dose series (doses separated by at least 4 months) of adult formulation Recombivax HB is licensed for use in children aged 11 through 15 years.
     - For other catch-up guidance, see Figure 2.
   - Routine vaccination:
     - Administer a series of RV vaccine to all infants as follows: 1. If Rotarix is used, administer a 2-dose series at ages 2 and 4 months. 2. If RotaTeq is used, administer a 3-dose series at ages 2, 4, and 6 months. 3. If any dose in the series was RotaTeq or vaccine product is unknown for any dose in the series, a total of 3 doses of RV vaccine should be administered.
     - Catch-up vaccination:
       - The maximum age for the first dose in the series is 14 weeks. 6 days; vaccination should not be initiated for infants aged 15 weeks, 0 days, or older.
       - The maximum age for the final dose in the series is 8 months, 0 days.
       - For other catch-up guidance, see Figure 2.
   - Diphtheria and tetanus toxoids and acellular pertussis (DTap) vaccine. (Minimum age: 6 weeks. Exception: DTap-IPV [Kinnix, Quadracel]: 4 years)
     - Routine vaccination:
       - Administer a 5-dose series of DTap vaccine at ages 2, 4, 6, 15 through 18 months, and 4 through 6 years. The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.
       - Indavertent administration of fourth DTaP dose early:
         - If the fourth dose of DTaP was administered at least 4 months after the third dose of DTaP and the child was 12 months of age or older, it does not need to be repeated. Catch-up vaccination:
           - The fifth dose of DTaP vaccine is not necessary if the fourth dose was administered at age 4 years or older.
           - For other catch-up guidance, see Figure 2.
   - Haemophilus influenzae type b (Hib) conjugate vaccine. (Minimum age: 6 weeks for PRP-T [ActHIB, DTaP-IPV/Hib (Pentacel), Hibercix, and Hib-MenCY (MenHibrix)], PRP-OMP [PedvaxHIB])
     - Routine vaccination:
       - Administer a 2- or 3-dose Hib vaccine primary series and a booster dose (dose 3 or 4, depending on vaccine used in primary series) at age 12 through 15 months to complete a full Hib vaccine series.
       - The primary series with ActHIB, MenHibrix, Hibercix, or Pentacel consists of 3 doses and should be administered at ages 2, 4, and 6 months. The primary series with PedvaxHIB consists of 2 doses and should be administered at ages 2 and 4 months; a dose at age 6 months is not indicated.
       - One booster dose (dose 3 or 4, depending on vaccine used in primary series) of any Hib vaccine should be administered at age 12 through 15 months.
       - For recommendations on the use of MenHibrix in patients at increased risk for meningococcal disease, refer to the meningococcal vaccine footnotes and also to MMWR February 28, 2014 / 63(RR01):1-13, available at www.cdc.gov/mmwr/PDF/rr/rr6301.pdf.
For further guidance on the use of the vaccines mentioned below, see: www.cdc.gov/vaccines/hcp/acip-recs/index.html

Catch-up vaccination:

- If dose 1 was administered at ages 12 through 14 months, administer a second (final) dose at least 8 weeks after dose 1, regardless of Hib vaccine used in the primary series.
  - If both doses were PRP-OMP (PedvaxHIB or COMVAX) and were administered before the first birthday, the third (and final) dose should be administered at age 12 through 59 months and at least 8 weeks after the second dose.
  - If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a third (and final) dose at age 12 through 15 months or 8 weeks after second dose, whichever is later.
  - If first dose is administered before the first birthday and second dose administered at younger than 15 months, a third (and final) dose should be administered 8 weeks later.
  - For unvaccinated children aged 15–59 months, administer only 1 dose.
  - For other catch-up guidance, see Figure 2. For catch-up vaccination with PCV13, 2 years for PPSV23.

Routine vaccination with PCV13:

- Administer a 4-dose series of PCV13 at ages 2, 4, and 6 months and at age 12 through 15 months.

Catch-up vaccination with PCV13:

- Administer 1 dose of PCV13 to all healthy children aged 2 through 59 months who are not completely vaccinated for their age.
- For other catch-up guidance, see Figure 2.

Vaccination of persons with high-risk conditions:

- Children aged 12 through 59 months who are at increased risk for Hib disease, including chemotherapy recipients and those with anatomic or functional asplenia (including sickle cell disease), human immunodeficiency virus (HIV) infection, immunoglobulin deficiency, or early component complement deficiency, who have received either no doses or only 1 dose of Hib vaccine before age 12 months, should receive 2 additional doses of Hib vaccine before age 12 months.
- Children who received 2 or more doses of Hib vaccine before age 12 months should receive 1 additional dose.
- For patients younger than age 5 years undergoing chemotherapy or radiation treatment who received a Hib vaccine dose(s) within 14 days of starting therapy or during therapy, repeat the dose(s) at least 3 months following therapy completion.
- Recipients of hematopoietic stem cell transplant (HSCT) should be revaccinated with a 3-dose regimen of Hib vaccine starting 6 to 12 months after successful transplant, regardless of vaccination history; doses should be administered at least 4 weeks apart.
- A single dose of any Hib-containing vaccine should be administered to unimmunized children and adolescents 15 months of age and older undergoing an elective spleenectomy; if possible, vaccine should be administered at least 3 days after procedure.
- Hib vaccine is not routinely recommended for patients 5 years or older. However, 1 dose of Hib vaccine should be administered to unimmunized persons aged 5 years or older who have anatomic or functional asplenia (including sickle cell disease) and unimmunized persons 5 through 18 years of age with HIV infection.
  * Patients who have not received a primary series and booster dose or at least 1 dose of Hib vaccine before age 14 months are considered unimmunized.

5. Pneumococcal vaccines. (Minimum age: 6 weeks for PCV13, 2 years for PPSV23)

Routine vaccination with PCV13:

- Administer a 4-dose series of PCV13 at ages 2, 4, and 6 months and at age 12 through 15 months.

Catch-up vaccination with PCV13:

- Administer 1 dose of PCV13 to all healthy children aged 24 through 59 months who are not completely vaccinated for their age.
- For other catch-up guidance, see Figure 2.

Vaccination of persons with high-risk conditions with PCV13 and PPSV23:

- All recommended PCV13 doses should be administered prior to PPSV23 vaccination if possible.
- For children aged 2 through 5 years with any of the following conditions: chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure); chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy); diabetes mellitus; cerebrospinal fluid leak; coarctation of the aorta; sickle cell disease and other hemoglobinopathies; anatomic or functional asplenia; HIV infection; chronic renal failure; nephrotic syndrome; diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin disease; solid organ transplantation; or congenital immunodeficiency:
  1. Administer 1 dose of PCV13 if any incomplete schedule of 3 doses of PCV13 was received previously.
  2. Administer 2 doses of PCV13 at least 8 weeks apart if unvaccinated or any incomplete schedule of fewer than 3 doses of PCV13 was received previously.
  3. The minimum interval between doses of PCV13 is 8 weeks.

For children with no history of PPSV23 vaccination, administer PPSV23 at least 8 weeks after the most recent dose of PCV13.

- For children aged 6 through 18 years who have cerebrospinal fluid leak; coarctation of the aorta; sickle cell disease and other hemoglobinopathies; anatomic or functional asplenia; congenital or acquired immunodeficiencies; HIV infection; chronic renal failure; nephrotic syndrome; diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin disease; generalized malignancy; solid organ transplantation; or multiple myeloma:
  1. If neither PCV13 nor PPSV23 has been received previously, administer 1 dose of PCV13 and 1 dose of PPSV23 at least 8 weeks later.
  2. If PCV13 has been received previously but PPSV23 has not, administer 1 dose of PPSV23 at least 8 weeks after the most recent dose of PCV13.
  3. If PPSV23 has been received but PCV13 has not, administer 1 dose of PCV13 at least 8 weeks after the most recent dose of PPSV23.

- For children aged 6 through 18 years with chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure), chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy), diabetes mellitus, alcoholism, or chronic liver disease, who have not received PPSV23, administer 1 dose of PPSV23. If PCV13 has been previously received, then PPSV23 should be administered at least 8 weeks after any prior PCV13 dose.
- A single revaccination with PPSV23 should be administered 5 years after the first dose to children with sickle cell disease or other hemoglobinopathies; anatomic or functional asplenia; congenital or acquired immunodeficiencies; HIV infection; chronic renal failure; nephrotic syndrome; diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin disease; generalized malignancy; solid organ transplantation; or multiple myeloma.

6. Inactivated poliovirus vaccine (IPV). (Minimum age: 6 weeks)

Routine vaccination:

- Administer a 4-dose series of IPV at ages 2, 4, 6 through 18 months, and 4 through 6 years. The final dose in the series should be administered on or after the fourth birthday and at least 6 months after the previous dose.

Catch-up vaccination:

- In the first 6 months of life, minimum age and minimum intervals are only recommended if the person is at risk of imminent exposure to circulating poliovirus (i.e., travel to a polio-endemic region or during an outbreak).
- If 4 or more doses are administered before age 4 years, an additional dose should be administered at age 4 through 6 years and at least 6 months after the previous dose.
- 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.
- If both oral polio vaccine (OPV) and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of the child’s current age. If only OPV was administered, and all doses were given prior to age 4 years, 1 dose of IPV should be given at 4 years or older, at least 4 weeks after the last OPV dose.
- IPV is not routinely recommended for U.S. residents aged 18 years or older.
- For other catch-up guidance, see Figure 2.
For further guidance on the use of the vaccines mentioned below, see: www.cdc.gov/vaccines/hcp/acip-recs/index.html.

7. Influenza vaccines. (Minimum age: 6 months for inactivated influenza vaccine [IIV]; 18 years for recombinant influenza vaccine [RIV])
   Routine vaccination:
   • Administer influenza vaccine annually to all children beginning at age 6 months. For the 2016–17 season, use of live attenuated influenza vaccine (LAIV) is not recommended.
   For children aged 6 months through 8 years:
   • For the 2016–17 season, administer 2 doses (separated by at least 4 weeks) to children who are receiving influenza vaccine for the first time or who have not previously received ≥2 doses of trivalent or quadrivalent influenza vaccine before July 1, 2016. For additional guidance, follow dosing guidelines in the 2016–17 ACIP influenza vaccine recommendations (see MMWR August 26, 2016;65(5):1-54, available at www.cdc.gov/mmwr/volumes/65/rr/pdfs/rr6505.pdf).
   • For the 2017–18 season, follow dosing guidelines in the 2017–18 ACIP influenza vaccine recommendations.
   For persons aged 9 years and older:
   • Administer 1 dose.

8. Measles, mumps, and rubella (MMR) vaccine. (Minimum age: 12 months for routine vaccination)
   Routine vaccination:
   • Administer a 2-dose series of MMR vaccine at ages 12 through 15 months and 4 through 6 years. The second dose may be administered before age 4 years, provided at least 4 weeks have elapsed since the first dose.
   • Administer 1 dose of MMR vaccine to infants aged 6 through 11 months before departure from the United States for international travel. These children should be revaccinated with 2 doses of MMR vaccine, the first at age 12 through 15 months (12 months if the child remains in an area where disease risk is high), and the second dose at least 4 weeks later.
   • Administer 2 doses of MMR vaccine to children aged 12 months and older before departure from the United States for international travel. The first dose should be administered on or after age 12 months and the second dose at least 4 weeks later.

Catch-up vaccination:
   • Ensure that all school-aged children and adolescents have had ≥2 doses of MMR vaccine; the minimum interval between the 2 doses is 4 weeks.

9. Varicella (VAR) vaccine. (Minimum age: 12 months)
   Routine vaccination:
   • Administer a 2-dose series of VAR vaccine at ages 12 through 15 months and 4 through 6 years. The second dose may be administered before age 4 years, provided at least 3 months have elapsed since the first dose. If the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.

Catch-up vaccination:
   • Ensure that all persons aged 7 through 18 years without evidence of immunity (see MMWR 2007;56(No. RR-4), available at www.cdc.gov/mmwr/pdf/rr/rr5604.pdf) have 2 doses of varicella vaccine. For children aged 7 through 12 years, the recommended minimum interval between doses is ≥3 months (if the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid); for persons aged 13 years and older, the minimum interval between doses is 4 weeks.

10. Hepatitis A (HepA) vaccine. (Minimum age: 12 months)
    Routine vaccination:
    • Initiate the 2-dose HepA vaccine series at ages 12 through 23 months; separate the 2 doses by 6 to 18 months.
    • Children who have received 1 dose of HepA vaccine before age 24 months should receive a second dose 6 to 18 months after the first dose.
    • For any person aged 2 years and older who has not already received the HepA vaccine series, 2 doses of HepA vaccine separated by 6 to 18 months may be administered if immunity against hepatitis A virus infection is desired.

Catch-up vaccination:
   • The minimum interval between the 2 doses is 6 months.
   Special populations:
   • Administer 2 doses of HepA vaccine at least 6 months apart to previously unvaccinated persons who live in areas where vaccination programs target older children, or who are at increased risk for infection. This includes persons traveling to or working in countries that have high or intermediate endemicity of infection; men having sex with men; users of injection and non-injection illicit drugs; persons who work with HAV-infected primates or with HAV in a research laboratory; persons with clotting-factor disorders; persons with chronic liver disease; and persons who anticipate close, personal contact (e.g., household or regular babysitting) with an international adoptee during the first 60 days after arrival in the United States from a country with high or intermediate endemicity. The first dose should be administered as soon as the adoption is planned, ideally, 2 or more weeks before the arrival of the adoptee.
   • If the first dose is administered at age 16 years or older, a booster dose should be administered at age 16 through 18 years if not previously vaccinated.
   • If the first dose is administered at age 13 through 15 years, a booster dose should be administered at age 16 through 18 years, with a minimum interval of at least 8 weeks between doses.
   • If the first dose is administered at age 16 years or older, a booster dose is not needed.

   For other catch-up guidance, see Figure 2.

Clinical discretion:
   • Young adults aged 16 through 23 years (preferred age range is 16 through 18 years) who are at increased risk for meningococcal disease may be vaccinated with a 2-dose series of either Bexsero (0, ≥1 month) or Trumena (0, 6 months) vaccine to provide short-term protection against most strains of serogroup B meningococcal disease. The two MenB vaccines are not interchangeable; the same vaccine product must be used for all doses.
   • If the second dose of Trumena is given at an interval of <6 months, a third dose should be given at least 6 months after the first dose; the minimum interval between the second and third doses is 4 weeks.

Meningococcal conjugate ACWY vaccination of persons with high-risk conditions and other persons at increased risk:
   Children with anatomic or functional asplenia (including sickle cell disease), children with HIV infection, or children with persistent complement component deficiency (includes persons with inherited or chronic deficiencies in C3, C5-9, properdin, Factor D, Factor H, or taking eculizumab [Soliris]):
   • Meningococcal ACWY vaccine as primary series
   • Meningococcal ACWY vaccine as a booster dose

Children aged 7 through 18 years with high-risk conditions:
   • Meningococcal ACWY vaccine as primary series
   • Meningococcal ACWY vaccine as a booster dose

Children aged 2 years and older:
   • Meningococcal ACWY vaccine as primary series
   • Meningococcal ACWY vaccine as a booster dose

Children with high-risk conditions and other persons at increased risk for meningococcal disease:
   • Meningococcal ACWY vaccine as primary series
   • Meningococcal ACWY vaccine as a booster dose

11. Meningococcal vaccines. (Minimum age: 6 weeks for Hib-MenC1 [MenHibrix], 2 months for MenACYW-CRM [Menveo], 9 months for MenACWY-Q [Menactra], 10 years for serogroup B meningococcal [MenB] vaccines: MenB-4C [Bexsero] and MenB-FHbp [Trumena])
   Routine vaccination:
   • Administer a single dose of Menactra or Menveo vaccine at age 11 through 12 years, with a booster dose at age 16 years.
   • For children aged 2 months through 18 years with high-risk conditions, see “Meningococcal conjugate ACWY vaccination of persons with high-risk conditions and other persons at increased risk” and “Meningococcal B vaccination of persons with high-risk conditions and other persons at increased risk” below.

Catch-up vaccination:
   • Administer Menactra or Menveo vaccine at age 13 through 18 years if not previously vaccinated.
   • If the first dose is administered at age 13 through 15 years, a booster dose should be administered at age 16 through 18 years, with a minimum interval of at least 8 weeks between doses.
   • If the first dose is administered at age 16 years or older, a booster dose is not needed.
   • For other catch-up guidance, see Figure 2.
For further guidance on the use of the vaccines mentioned below, see: www.cdc.gov/vaccines/hcp/acip-recs/index.html.

- **Menactra**
  - **Children with anatomic or functional asplenia or HIV infection**
    - Children 24 months and older who have not received a complete series. Administer 2 primary doses at least 6 weeks apart. If Menactra is administered to a child with asplenia (including sickle cell disease) or HIV infection, do not administer Menactra until age 2 years and at least 4 weeks after the completion of the last dose of serogroup B.
  - **Children with persistent complement component deficiency**
    - Children 9 through 23 months.
    - Children 24 months and older who have not received a complete series. Administer 2 primary doses at least 8 weeks apart.
  - **All high-risk children**
    - If Menactra is to be administered to a child at high risk for meningococcal disease, it is recommended that Menactra be given either before or at the same time as DTaP.

**Meningococcal B vaccination of persons with high-risk conditions and other persons at increased risk of disease:**

- Children with anatomic or functional asplenia (including sickle cell disease) or children with persistent complement component deficiency (includes persons with inherited or chronic deficiencies in C3, C5-9, properdin, factor D, factor H, or taking eculizumab [Soliris]).
- Bexsero or Trumenba
- Menactra or Menveo.

For children who travel to or reside in countries in which meningococcal disease is hyperendemic or epidemic, including countries in the African meningitis belt or the Hajj:

- Administer an age-appropriate formulation and series of Menactra or Menveo for protection against serogroups A and W meningococcal disease. Prior receipt of MenHibrix is not sufficient for children traveling to the meningococcal belt or the Hajj because it does not contain serogroups A or W.

For children at risk during an outbreak attributable to a vaccine serogroup:

- For serogroup A, C, W, or Y: Administer or complete an age- and formulation-appropriate series of MenHibrix, Menactra, or Menveo.
- For serogroup B: Administer a 2-dose series of Bexsero, with doses at least 1 month apart, or a 3-dose series of Trumenba, with the second dose at least 1-2 months after the first and the third dose at least 6 months after the first. The two MenB vaccines are not interchangeable; the same vaccine product must be used for all doses. For MenACWY booster doses among persons with high-risk conditions, refer to MMWR 2013;62(24):527-530, at www.cdc.gov/mmwr/pdf/wk/mm6324.pdf.

For children 9 through 23 months.

- **Administer** an age-appropriate formulation and series of MenB vaccine.
- **Complete** series.

For children 24 months and older who have not received a complete series.

- **Administer** 2 primary doses at least 8 weeks apart.

**Catch-up vaccination:**

- **If administered inadvertently to a child aged 7 through 12 years,** there is no intervention needed; the remaining vaccine doses should be delayed until after the pregnancy. Pregnancy testing is not needed before HPV vaccination. *See MMWR December 16, 2016;65(49):1405-1408, available at www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6549a5.pdf.

- **If administered inadvertently to an adolescent aged 11 through 18 years,** the dose should be counted as the adolescent Tdap booster.

- **For other catch-up guidance,** see Figure 2.

12. Tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine. (Minimum age: 10 years for both Boostrix and Adacel).

**Routine vaccination:**

- Administer 1 dose of Tdap vaccine to all adolescents aged 11 through 12 years.
- Tdap may be administered regardless of the interval since the last tetanus and diphtheria toxoid-containing vaccine.

**Catch-up vaccination:**

- Persons aged 7 years and older who are not fully immunized with DTaP vaccine should receive Tdap vaccine as 1 dose (preferably the first) in the catch-up series; if additional doses are needed, use Td vaccine. For children 7 through 10 years who receive a dose of Tdap as part of the catch-up series, an adolescent Tdap vaccine dose at age 11 through 12 years may be administered.
- Persons aged 11 through 18 years who have not received Tdap vaccine should receive a dose, followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter.

- Inadvertent doses of Tdap vaccine:
  - If administered inadvertently to a child aged 7 through 10 years, the dose may count as part of the catch-up series. This dose may count as the adolescent Tdap dose, or the child may receive a Tdap booster dose at age 11 through 12 years.
  - If administered inadvertently to an adolescent aged 11 through 18 years, the dose should be counted as the adolescent Tdap booster.

13. Human papillomavirus (HPV) vaccines. (Minimum age: 9 years for 4vHPV [Gardasil] and 9vHPV [Gardasil 9])

**Routine and catch-up vaccination:**

- Administer a 2-dose series of HPV vaccine on a schedule of 0, 6-12 months to all adolescents aged 11 or 12 years. The vaccination series can start at age 9 years.
- Administer HPV vaccine to all adolescents through age 18 years who were not previously adequately vaccinated. The number of recommended doses is based on age at administration of the first dose.
- For persons initiating vaccination before age 15, the recommended immunization schedule is 2 doses of HPV vaccine at 0, 6-12 months.
- For persons initiating vaccination at age 15 years or older, the recommended immunization schedule is 3 doses of HPV vaccine at 0, 1–2, 6 months.
- A vaccine dose administered at a shorter interval should be readministered at the recommended interval.

- In a 2-dose schedule of HPV vaccine, the minimum interval is 5 months between the first and second dose. If the second dose is administered at a shorter interval, a third dose should be administered a minimum of 12 weeks after the second dose and a minimum of 5 months after the first dose.
- In a 3-dose schedule of HPV vaccine, the minimum intervals are 4 weeks between the first and second dose, 12 weeks between the second and third dose, and 5 months between the first and third dose. If a vaccine dose is administered at a shorter interval, it should be readministered after another minimum interval has been met since the most recent dose.

**Special populations:**

- For children with history of sexual abuse or assault, administer HPV vaccine beginning at age 9 years.
- Immunocompromised persons*, including those with human immunodeficiency virus (HIV) infection, should receive a 3-dose series at 0, 1–2, and 6 months, regardless of age at vaccine initiation.
- Note: HPV vaccination is not recommended during pregnancy, although there is no evidence that the vaccine doses harm. If a woman is found to be pregnant after initiating the vaccination series, no intervention is needed; the remaining vaccine doses should be delayed until after the pregnancy. Pregnancy testing is not needed before HPV vaccination.

*See MMWR December 16, 2016;65(49):1405-1408, available at www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6549a5.pdf.