Recommended Immunization Schedules for Persons Aged 0 Through 18 Years
UNITED STATES, 2014

This schedule includes recommendations in effect as of January 1, 2014. 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 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 (http://www.vaers.hhs.gov) or by telephone (800-822-7967).

The Recommended Immunization Schedules for Persons Aged 0 Through 18 Years are approved by the

Advisory Committee on Immunization Practices
(http://www.cdc.gov/vaccines/hcp/acip)

American Academy of Pediatrics
(http://www.aap.org)

American Academy of Family Physicians
(http://www.aafp.org)

American College of Obstetricians and Gynecologists
(http://www.acog.org)
Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2014.

(For those who fall behind or start late, see the catch-up schedule [Figure 2]).

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are in bold.

This schedule includes recommendations in effect as of January 1, 2014. 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 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 (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 (http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm) or by telephone (800-CDC-INFO [800-232-4636]).

This schedule is approved by the Advisory Committee on Immunization Practices (http://www.cdc.gov/vaccines/acip), the American Academy of Pediatrics (http://www.aap.org), the American Academy of Family Physicians (http://www.aafp.org), and the American College of Obstetricians and Gynecologists (http://www.acog.org).

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

<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>16-18 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B (HepB)</td>
<td>1 dose</td>
<td></td>
<td></td>
<td>2 dose</td>
<td></td>
<td></td>
<td>3 dose</td>
<td></td>
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<tr>
<td>Rotavirus (RV) RV1 (2-dose series); RV5 (3-dose series)</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
<td></td>
<td>5 dose</td>
<td></td>
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<td></td>
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<tr>
<td>Diphtheria, tetanus, &amp; acellular pertussis (DTaP; ≤ 7 yrs)</td>
<td>1 dose</td>
<td>2 dose</td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
<td></td>
<td>5 dose</td>
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<tr>
<td>Tetanus, diphtheria, &amp; acellular pertussis (Tdap; &gt; 7 yrs)</td>
<td>1 dose</td>
<td>2 dose</td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
<td></td>
<td>5 dose</td>
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</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td>1 dose</td>
<td>2 dose</td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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<tr>
<td>Inactivated poliovirus (IPV) (≤ 18 yrs)</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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<tr>
<td>Influenza (IIV; LAIV) 2 doses for some: See footnote 8</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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<tr>
<td>Varicella (VAR)</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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<tr>
<td>Hepatitis A (HepA)</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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<tr>
<td>Human papillomavirus (HPV2: females only; HPV4: males and females)</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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<tr>
<td>Meningococcal (Hib-MenCY ≥ 6 weeks; MenACWY-D ≥ 9 mos; MenACWY-CRM ≥ 2 mos)</td>
<td>1 dose</td>
<td>2 dose</td>
<td></td>
<td>3 dose</td>
<td></td>
<td>4 dose</td>
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</tbody>
</table>

Legend:
- **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
- **Pink**: Range of recommended ages during which catch-up is encouraged and for certain high-risk groups
- **White**: Not routinely recommended
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, 2014.

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.

### Persons aged 4 months through 6 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 1 to dose 2</th>
<th>Dose 2 to dose 3</th>
<th>Dose 3 to dose 4</th>
<th>Dose 4 to dose 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B¹</td>
<td>Birth</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>
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</tr>
<tr>
<td>Rotavirus²</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks²</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diphtheria, tetanus, &amp; acellular pertussis ³</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks</td>
<td>6 months</td>
<td>6 months³</td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b⁴</td>
<td>6 weeks</td>
<td>4 weeks if first dose administered at younger than age 12 months</td>
<td>8 weeks (as final dose) if first dose administered at age 12 through 14 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No further doses needed if first dose administered at age 15 months or older</td>
<td>8 weeks (and at least 16 weeks after first dose; minimum age for the final dose is 24 weeks) if current age is younger than 12 months and first dose administered at &lt; 7 months old</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>4 weeks if current age is younger than 12 months and first dose administered at age 12 through 59 months (as final dose) if current age is 12 through 59 months and first dose administered between 7 through 11 months (regardless of Hib vaccine [PRP-T or PRP-OMP] used for first dose); OR if current age is 12 through 59 months and first dose administered at younger than 12 months; OR first 2 doses were PRP-OMP and administered at younger than 12 months. No further doses needed if previous dose administered at age 15 months or older</td>
<td></td>
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<tr>
<td>Pneumococcal⁶</td>
<td>6 weeks</td>
<td>4 weeks if first dose administered at younger than age 12 months</td>
<td>8 weeks (as final dose)</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>No further doses needed for healthy children if previous dose administered at age 24 months or older</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivated poliovirus²</td>
<td>6 weeks</td>
<td>4 weeks if first dose administered at younger than age 12 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>8 weeks (as final dose for healthy children) if current age is 12 through 59 months (as final dose) if current age is 12 through 59 months and first dose administered at younger than 12 months; OR first 2 doses were PRP-OMP and administered at younger than 12 months. No further doses needed if previous dose administered at age 15 months or older</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal¹³</td>
<td>6 weeks</td>
<td>8 weeks²</td>
<td>See footnote 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella³</td>
<td>12 months</td>
<td>4 weeks</td>
<td>See footnote 13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella¹⁰</td>
<td>12 months</td>
<td>3 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A¹⁷</td>
<td>12 months</td>
<td>6 months</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Persons aged 7 through 18 years

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Minimum Interval Between Doses</th>
<th>Dose 1 to dose 2</th>
<th>Dose 2 to dose 3</th>
<th>Dose 3 to dose 4</th>
<th>Dose 4 to dose 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetanus, diphtheria; tetanus, diphtheria, &amp; acellular pertussis ⁴</td>
<td>7 years ⁴</td>
<td>4 weeks</td>
<td>4 weeks if first dose of DTaP/DT administered at younger than age 12 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6 months if first dose of DTaP/DT administered at age 12 months or older and then no further doses needed for catch-up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus²</td>
<td>9 years</td>
<td>Routine dosing intervals are recommended¹⁴</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A¹⁷</td>
<td>12 months</td>
<td>6 months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B¹</td>
<td>Birth</td>
<td>4 weeks</td>
<td>8 weeks (and at least 16 weeks after first dose)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inactivated poliovirus²</td>
<td>6 weeks</td>
<td>4 weeks</td>
<td>4 weeks²</td>
<td>6 months⁷</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal¹³</td>
<td>6 weeks</td>
<td>8 weeks¹³</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella³</td>
<td>12 months</td>
<td>4 weeks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella¹⁰</td>
<td>12 months</td>
<td>3 months if person is younger than age 13 years 4 weeks if person is aged 13 years or older</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

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

- For contraindications and precautions to use of a vaccine and for additional information regarding that vaccine, vaccination providers should consult the relevant ACIP statement available online at http://www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For purposes of calculating intervals between doses, 4 weeks = 28 days. Intervals of 4 weeks or greater are determined by calendar months.
- Vaccine doses administered 4 days or less 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 MMWR, General Recommendations on Immunization and Reports / Vol. 60 / No. 2; Table 1. Recommended and minimum ages and intervals between vaccine doses available online at http://www.cdc.gov/mmwr/pdf/rr/rr6002.pdf.
- Information on travel vaccine requirements and recommendations is available at http://wwwnc.cdc.gov/travel/destinations/list.

1. Hepatitis B (HepB) vaccine. (Minimum age: birth)
   Routine vaccination:
   - At birth:
     - Administer monovalent HepB vaccine to all newborns before hospital discharge.
     - For infants born to hepatitis B surface antigen (HBsAg)-positive mothers, administer HepB vaccine and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth. These infants should be tested for HBsAg and antibody to HBsAg (anti-HBs) 1 to 2 months after completion of the HepB series, at age 9 through 18 months (preferably at the next well-child visit).
     - If mother’s HBsAg status is unknown, within 12 hours of birth administer HepB vaccine regardless of birth weight. For infants weighing less than 2,000 grams, administer HBIG in addition to HepB vaccine within 12 hours of birth. Determine mother’s HBsAg status as soon as possible and, if mother is HBsAg-positive, also administer HBIG for infants weighing 2,000 grams or more as soon as possible, but no later than age 7 days.
   
   Doses following the birth dose:
   - The second dose should be administered at age 1 or 2 months. Monovalent HepB vaccine should be used for doses administered before age 6 weeks.
   - Infants who did not receive a birth dose should receive 3 doses of a HepB-containing vaccine on a schedule of 0, 1 to 2 months, and 6 months starting as soon as feasible. See Figure 2.
   - Administer the second dose 1 to 2 months after the first dose (minimum interval of 4 weeks), administer the third dose at least 8 weeks after the second dose AND at least 16 weeks after the first dose. The final (third or fourth) dose in the HepB vaccine series should be administered no earlier than age 24 weeks.
   - Administration of a total of 4 doses of HepB vaccine is permuted 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.

2. Rotavirus (RV) vaccines. (Minimum age: 6 weeks for both RV1 [Rotarix] and RV5 [RotaTeq])
   Routine vaccination:
   - Administer a series of RV vaccine to all infants as follows:
     1. If Rotarix is used, administer a 2-dose series at 2 and 4 months of age.
     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.

3. Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine. (Minimum age: 6 weeks. Exception: DTaP-IPV [Kinrix]: 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.
   
   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.

4. Tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine. (Minimum age: 10 years for Boostrix, 11 years for 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.
   - Administer 1 dose of Tdap vaccine to pregnant adolescents during each pregnancy (preferred during 27 through 36 weeks gestation) regardless of time since prior Td or Tdap vaccination.
   
   Catch-up vaccination:
   - Persons aged 5 years and older who are not fully immunized with DTaP vaccine should receive Tdap vaccine as 1 (preferably the first) dose 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 should NOT be administered. Td should be administered instead 10 years after the Tdap dose.
   - 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 DTaP vaccine:
     - If administered inadvertently to a child aged 7 through 10 years may count as part of the catch-up series. This dose may count as the adolescent Tdap dose, or the child can later 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.
   - For other catch-up guidance, see Figure 2.

5. Haemophilus influenzae type b (Hib) conjugate vaccine. (Minimum age: 6 weeks for PRP-T [ACTHib, DTaP-IPV/Hib (Pentacel) and Hib-MenCY (MenHibrix)], PRP-OMP [PedvaxHIB or COMVAX], 12 months for PRP-T [Hiberix])
   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, or Pentacel consists of 3 doses and should be administered at 2, 4, and 6 months of age. The primary series with PedvaxHib or COMVAX consists of 2 doses and should be administered at 2 and 4 months of age; 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. An exception is Hiberix vaccine. Hiberix should only be used for the booster (final) dose in children aged 12 months through 4 years who have received at least 1 prior dose of Hib-containing vaccine.
6. Pneumococcal vaccines (cont’d)

3. Administer 1 supplemental dose of PCV13 if 4 doses of PCV7 or other age-appropriate complete PCV7 series was received previously.

4. The minimum interval between doses of PCV (PCV7 or PCV13) is 8 weeks.

5. For children with no history of PPV23 vaccination, administer PPV23 at least 8 weeks after the most recent dose of PCV13.

- For children aged 6 through 18 years who have cerebrospinal fluid leak; cochlear implant; 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 PPV23 has been received previously, administer 1 dose of PCV13 now and 1 dose of PPV23 at least 8 weeks later.
  2. If PCV13 has been received previously but PPV23 has not, administer 1 dose of PPV23 at least 8 weeks after the most recent dose of PCV13.
  3. If PPV23 has been received previously, administer 1 dose of PPV23 at least 8 weeks after the most recent dose of PCV23.

- 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 PPV23, administer 1 dose of PPV23. If PCV13 has been received previously, then PPV23 should be administered at least 12 months after the last PCV13 dose.

- A single revaccination with PPV23 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; and multiple myeloma.

7. 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 for 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 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. IPV is not routinely recommended for U.S. residents aged 18 years or older.
- For other catch-up guidance, see Figure 2.

8. Influenza vaccines. (Minimum age: 6 months for inactivated influenza vaccine [IIV], 2 years for live, attenuated influenza vaccine [LAIV])

Routine vaccination:
- Administer a 4-dose series of IIV 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.
- For children aged 6 through 18 months 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 PPV23, administer 1 dose of PPV23. If PCV13 has been received previously, then PPV23 should be administered at least 12 months after the last PCV13 dose.

- A single revaccination with PPV23 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; and multiple myeloma.

- 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 PPV23, administer 1 dose of PPV23. If PCV13 has been received previously, then PPV23 should be administered at least 12 months after the last PCV13 dose.

- A single revaccination with PPV23 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; and multiple myeloma.

- 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 PPV23, administer 1 dose of PPV23. If PCV13 has been received previously, then PPV23 should be administered at least 12 months after the last PCV13 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 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. IPV is not routinely recommended for U.S. residents aged 18 years or older.

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

For more information, see: http://www.cdc.gov/mmwr/pdf/rr/rr6207.pdf.

9. Haemophilus influenzae type b (Hib) conjugate vaccine (cont’d)

- Administer 1 dose of PCV13 if 3 doses of PCV (PCV7 and/or PCV13) were received previously.

- Administer 2 doses of PCV13 at least 8 weeks apart if fewer than 3 doses of PCV (PCV7 and/or PCV13) were received previously.
For further guidance on the use of the vaccines mentioned below, see: http://www.cdc.gov/vaccines/hcp/acip-recs/index.html.

9. 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. 

10. 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 MMRV 2007: 56 [No. RR-4], available at http://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. 

11. Hepatitis A (HepA) vaccine. (Minimum age: 12 months)
   Routine vaccination:
   • Initiate the 2-dose HepA vaccine series at 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 two 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 HIV-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 with persons with chronic liver disease or who have been exposed to HAV. 

12. Human papillomavirus (HPV) vaccines. (Minimum age: 9 years for HPV2 [Cervarix] and HPV4 [Gardasil])
   Routine vaccination:
   • Administer a 3-dose series of HPV vaccine on a schedule of 0, 1-2, and 6 months to all adolescents aged 11 through 12 years. Either HPV2 or HPV4 may be used for females, and only HPV4 may be used for males. 
   • The vaccine series may be started at age 9 years. 
   • Administer the second dose 1 to 2 months after the first dose (minimum interval of 4 weeks), administer the third dose 24 weeks after the first dose and 16 weeks after the second dose (minimum interval of 12 weeks). 
   Catch-up vaccination:
   • Administer the vaccine series to females (either HPV2 or HPV4) and males (HPV4) at age 13 through 18 years if not previously vaccinated. 
   • Use recommended routine dosing intervals (see above) for vaccine series catch-up. 

13. Meningococcal conjugate vaccines. (Minimum age: 6 weeks for Hib-MenCY [MenHibrix], 9 months for MenACWY-D [Menactra], 2 months for MenACWY-CRM [Menveo])
   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. 
   • Adolescents aged 11 through 18 years with human immunodeficiency virus (HIV) infection should receive a 2-dose primary series of Menactra or Menveo with at least 8 weeks between doses. 
   • For children aged 2 months through 18 years with high-risk conditions, see 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. 
   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): 
     1. For children younger than 19 months of age, administer a 4-dose infant series of MenHibrix or Menveo at 2, 4, 6, and 12 through 15 months of age. 
     2. For children aged 19 through 23 months who have not completed a series of MenHibrix or Menveo, administer 2 primary doses of Menveo at least 3 months apart. 
     3. For children aged 24 months and older who have not received a complete series of MenHibrix or Menveo, administer 2 primary doses of Menactra at least 3 months apart. If Menactra is administered to a child with asplenia (including sickle cell disease), do not administer Menactra until 2 years of age and at least 4 weeks after the completion of all PCV13 doses. 
   • Children with persistent complement component deficiency: 
     1. For children younger than 19 months of age, administer a 4-dose infant series of either MenHibrix or Menveo at 2, 4, 6, and 12 through 15 months of age. 
     2. For children 7 through 23 months who have not received vaccination, two options exist depending on age and vaccine brand: 
        a. For children who initiate vaccination with Menveo at 7 months through 23 months of age, a 2-dose series should be administered with the second dose after 12 months of age and at least 3 months after the first dose. 
        b. For children who initiate vaccination with Menactra at 9 months through 23 months of age, a 2-dose series of Menactra should be administered at least 3 months apart. 
        c. For children aged 24 months and older who have not received a complete series of MenHibrix, Menveo, or Menactra, administer 2 primary doses of either Menactra or Menveo at least 2 months apart. 
     • 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 meningitis belt or the Hajj because it does not contain serogroups A or W. 
     • For children at risk during a community outbreak attributable to a vaccine serogroup, administer or complete an age- and formulation-appropriate series of MenHibrix, Menactra, or Menveo. 
   Catch-up recommendations for persons with high-risk conditions: 
   1. If MenHibrix is administered to achieve protection against meningococcal disease, a complete age-appropriate series of MenHibrix should be administered. 
   2. If Menveo is administered to achieve protection against meningococcal disease, a complete age-appropriate series of Menveo should be administered. 
   3. For children who initiate vaccination with Menactra at 7 months through 9 months of age, a 2-dose series should be administered with the second dose after 12 months of age and at least 3 months after the first dose. 