Figure 1. Recommended Immunization Schedule for Children and Adolescents Ages 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>
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<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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<td>Diphtheria, tetanus &amp; acellular pertussis5 (DTaP: &lt;7 yrs)</td>
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<td>Varicella11 (VAR)</td>
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<td>2-dose series, see footnote 10</td>
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<td>Meningococcal13 (Hb-MenCY: ≥6 wks; MenACWY-CRM: ≥2 mos; MenACWY-D: ≥9 mos)</td>
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<td>Tetanus, diphtheria &amp; acellular pertussis14 (Tdap: ≥7 yrs)</td>
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<td>Human Papillomavirus15 (HPV)</td>
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<td>Pneumococcal polysaccharide17 (PPSV23)</td>
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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-reics/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) 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) or by telephone (800-CDC-INFO [800-232-4636]).

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-reics/index.html.
- For the 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 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 Table 1. Recommended and minimum 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.
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.

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

(continued)
### Footnotes: Recommended Immunization Schedule for Children and Adolescents Ages 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 ages 19 years and older, see the Recommended Adult Immunization Schedule.

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**1. Hepatitis B (HepB) vaccine. (Minimum age: birth)**

**Routine vaccination:**
- **At birth:**
  - Administer monovalent HepB vaccine to all newborns within 24 hours of birth.
  - 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) at age 9 through 12 months (preferably at the next well-child visit) or 1 to 2 months after completion of the HepB series if the series was delayed.
- **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 to 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 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 age 11 through 15 years.
- For other catch-up guidance, see Figure 2.

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**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 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 ages 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.

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**3. Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine. (Minimum age: 6 weeks. Exception: DTaP-IPV [Kinxrix, 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.
- Inadvertent 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 age 12 months 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.

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**4. Haemophilus influenzae type b (Hib) conjugate vaccine. (Minimum age: 6 weeks for PRP-T [ActHIB, DTaP-IPV/Hib (Pentacel), Hiberox, 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.

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

<table>
<thead>
<tr>
<th>Vaccine ▼</th>
<th>Indication ▲</th>
<th>Vaccination according to the routine schedule recommended</th>
<th>Recommended for persons with an additional risk factor for which the vaccine would be indicated</th>
<th>Vaccination is recommended, and additional doses may be necessary based on medical conditions (see footnotes)</th>
<th>No recommendation</th>
<th>Contraindicated</th>
<th>Precaution for vaccination</th>
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<td>Hepatitis B¹</td>
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<td>Diphtheria, tetanus, and acellular pertussis³ (DTaP)</td>
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*Severe Combined Immunodeficiency
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, use of IPV is not recommended if the dose is administered after age 4 years and older.

• For children ages 6 through 12 months, a single dose may be administered at any time after the fourth birthday.

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 ages 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 the 2017–18 season, follow dosing guidelines in the 2017–18 ACIP influenza vaccine recommendations.

• For children ages 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 ages 6 through 11 months before departure from the United States for international travel. These children should be revaccinated with doses of MMR vaccine, the first at age 12 through 15 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 ages 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 ages 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 ages 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 ages 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.

(continued)
• For any person age 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 8 months apart to previously unvaccinated persons who live in an area where meningococcal vaccine 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 arrival of the adoptee.

11. Meningococcal vaccines. (Minimum age: 6 weeks for Hib-MenC [MenHibrix], 2 months for MenACYW-CRM [Menveo], 9 months for MenACYW-D [Menactra], 10 years for serogroup B meningococcal [MenB] vaccines: MenB-4C [Bexsero] and MenB-FHbp [Trumenba])

Routine vaccination:
• Administer a single dose of Menactra or Menevo vaccine at age 11 through 12 years, with a booster dose at age 16 years.
• For children ages 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 of disease” below.

Catch-up vaccination:
• Administer Menactra or Menevo 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 6 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 ages 16 through 23 years (preferred age range is 16 through 18 years) who are not at increased risk for meningococcal disease may be vaccinated with a 2-dose series of either Bexsero (0, 31 month) or Trumenba (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 Trumenba 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 of disease:
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):
• Menveo
  • Children who initiate vaccination at age 8 weeks: Administer doses at ages 2, 4, 6, and 12 months.
  • Unvaccinated children who initiate vaccination at 7 to 23 months: Administer 2 primary doses, with the second dose at least 12 weeks after the first dose AND after the first birthday.
• Children 24 months and older who have not received a complete series: Administer 2 primary doses at least 8 weeks apart.
• MenHibrix
  • Children who initiate vaccination at age 6 weeks: Administer doses at ages 2, 4, 6, and 12 through 15 months.
  • If the first dose of MenHibrix is given at or after age 12 months, a total of 2 doses should be given at least 8 weeks apart to ensure protection against serogroups C and Y meningococcal disease.
• Menactra
  • Children with anatomic or functional asplenia or HIV infection:
    – Children 24 months or older who have not received a complete series: Administer 2 primary doses at least 8 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 all PCV13 doses.
  • Children with persistent complement component deficiency:
    – Children 9 through 23 months: Administer 2 primary doses at least 12 weeks apart.
    – 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
  • Persons 10 years or older who have not received a complete series: 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 should be used for all doses.
  • For children who travel to or reside in countries in which meningococcal disease is hyper-endemic or epidemic, including countries in the African meningitis belt or the Hajj:
    – Administer an age-appropriate formulation and series of Menactra or Menevo 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:
    – For serogroup A, C, W, or Y: Administer or complete an age- and formulation-appropriate series of MenHibrix, Menactra, or Menevo.
    – 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 should be used for all doses.


For other catch-up recommendations for these persons, and complete information on use of local vaccines, including guidance related to vaccination of persons at increased risk of infection, see meningococcal MMWR publications, available at www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html.

12. Tetanus and diptheria 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 ages 11 through 12 years.
• Tdap may be administered regardless of the interval since the last tetanus and diphtheria toxoids-containing vaccine.
• Administer 1 dose of Tdap vaccine to pregnant adolescents during each pregnancy (preferably during the early part of gestational weeks 27 through 36 weeks) regardless of time since prior Td or Tdap vaccination.

Catch-up vaccination:
• Persons ages 7 years and older who are not fully immunized with Tdap 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 age 7 through 10 years who receive a dose of Tdap as part of their catch-up series, an adolescent Tdap vaccine dose at age 11 through 12 years may be administered.
• Persons age 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 ages 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 ages 11 through 18 years, the dose should be counted as the adolescent Tdap booster.

For other catch-up guidance, see Figure 2.

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 ages 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 years, 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.
• Immune compromised persons*, including those with human immunodeficiency virus (HIV) infection, should receive a 3-dose series at 0, 0–1, 2–6 months.

Note: HPV vaccination is not recommended during pregnancy, although there is no evidence that the vaccine poses 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.