

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.

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19–23 mos	2-3 yrs	4-6 yrs	7-10 yrs	11-12 yrs	13–15 yrs	16–18 yrs
Hepatitis B ¹ (HepB)	1 st dose	←-----2 nd dose-----→			←-----3 rd dose-----→											
Rotavirus ² (RV) RV1 (2-dose series); RV5 (3-dose series)			1 st dose	2 nd dose	See footnote 2											
Diphtheria, tetanus, & acellular pertussis ³ (DTaP: <7 yrs)			1 st dose	2 nd dose	3 rd dose				←-----4 th dose-----→			5 th dose				
Tetanus, diphtheria, & acellular pertussis ⁴ (Tdap: ≥7 yrs)														(Tdap)		
<i>Haemophilus influenzae</i> type b ⁵ (Hib)			1 st dose	2 nd dose	See footnote 5				←-----3 rd or 4 th dose-----→ See footnote 5							
Pneumococcal conjugate ⁶ (PCV13)			1 st dose	2 nd dose	3 rd dose				←-----4 th dose-----→							
Pneumococcal polysaccharide ⁶ (PPSV23)																
Inactivated poliovirus ⁷ (IPV) (<18 yrs)			1 st dose	2 nd dose	←-----3 rd dose-----→							4 th dose				
Influenza ⁸ (IIV; LAIV) 2 doses for some: See footnote 8					Annual vaccination (IIV only)						Annual vaccination (IIV or LAIV)					
Measles, mumps, rubella ⁹ (MMR)								←-----1 st dose-----→				2 nd dose				
Varicella ¹⁰ (VAR)								←-----1 st dose-----→				2 nd dose				
Hepatitis A ¹¹ (HepA)								←-----2-dose series, See footnote 11-----→								
Human papillomavirus ¹² (HPV2: females only; HPV4: males and females)															(3-dose series)	
Meningococcal ¹³ (Hib-Men-CY ≥ 6 weeks; MenACWY-D ≥ 9 mos; MenACWY-CRM ≥ 2 mos)			See footnote 13											1 st dose		Booster

Range of recommended ages for all children
 Range of recommended ages for catch-up immunization
 Range of recommended ages for certain high-risk groups
 Range of recommended ages during which catch-up is encouraged and for certain high-risk groups
 Not routinely recommended

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.

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					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to dose 2	Dose 2 to dose 3	Dose 3 to dose 4	Dose 4 to dose 5
Hepatitis B ¹	Birth	4 weeks	8 weeks and at least 16 weeks after first dose; minimum age for the final dose is 24 weeks		
Rotavirus ²	6 weeks	4 weeks	4 weeks ²		
Diphtheria, tetanus, & acellular pertussis ³	6 weeks	4 weeks	4 weeks	6 months	6 months ³
<i>Haemophilus influenzae</i> type b ⁵	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose) if first dose administered at age 12 through 14 months No further doses needed if first dose administered at age 15 months or older	4 weeks ⁵ if current age is younger than 12 months and first dose administered at < 7 months old 8 weeks and age 12 months through 59 months (as final dose) ⁵ if current age is younger than 12 months and first dose administered between 7 through 11 months (regardless of Hib vaccine [PRP-T or PRP-OMP] used for first dose); <u>OR</u> if current age is 12 through 59 months and first dose administered at younger than age 12 months; <u>OR</u> 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	8 weeks (as final dose) This dose only necessary for children aged 12 through 59 months who received 3 (PRP-T) doses before age 12 months and started the primary series before age 7 months	
Pneumococcal ⁶	6 weeks	4 weeks if first dose administered at younger than age 12 months 8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older No further doses needed for healthy children if first dose administered at age 24 months or older	4 weeks if current age is younger than 12 months 8 weeks (as final dose for healthy children) if current age is 12 months or older No further doses needed for healthy children if previous dose administered at age 24 months or older	8 weeks (as final dose) This dose only necessary for children aged 12 through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age	
Inactivated poliovirus ⁷	6 weeks	4 weeks ⁷	4 weeks ⁷	6 months ⁷ minimum age 4 years for final dose	
Meningococcal ¹³	6 weeks	8 weeks ¹³	See footnote 13	See footnote 13	
Measles, mumps, rubella ⁹	12 months	4 weeks			
Varicella ¹⁰	12 months	3 months			
Hepatitis A ¹¹	12 months	6 months			
Persons aged 7 through 18 years					
Tetanus, diphtheria; tetanus, diphtheria, & acellular pertussis ⁴	7 years ⁴	4 weeks	4 weeks if first dose of DTaP/DT administered at younger than age 12 months 6 months if first dose of DTaP/DT administered at age 12 months or older and then no further doses needed for catch-up	6 months if first dose of DTaP/DT administered at younger than age 12 months	
Human papillomavirus ¹²	9 years	Routine dosing intervals are recommended ¹²			
Hepatitis A ¹¹	12 months	6 months			
Hepatitis B ¹	Birth	4 weeks	8 weeks (and at least 16 weeks after first dose)		
Inactivated poliovirus ⁷	6 weeks	4 weeks	4 weeks ⁷	6 months ⁷	
Meningococcal ¹³	6 weeks	8 weeks ¹³			
Measles, mumps, rubella ⁹	12 months	4 weeks			
Varicella ¹⁰	12 months	3 months if person is younger than age 13 years 4 weeks if person is aged 13 years or older			

NOTE: The above recommendations must be read along with the footnotes of this schedule. Footnotes can be found on the other side of this document.

Footnotes — Recommended immunization schedule for persons aged 0 through 18 years—United States, 2014

For further guidance on the use of the vaccines mentioned below, see: <http://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 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 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 *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>.
- For vaccination of persons with primary and secondary immunodeficiencies, see Table 13, "Vaccination of persons with primary and secondary immunodeficiencies," in General Recommendations on Immunization (ACIP), available at <http://www.cdc.gov/mmwr/pdf/rr/rr6002.pdf>; and American Academy of Pediatrics. Immunization in Special Clinical Circumstances, in Pickering LK, Baker CJ, Kimberlin DW, Long SS eds. *Red Book: 2012 report of the Committee on Infectious Diseases. 29th ed.* Elk Grove Village, IL: American Academy of Pediatrics.

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 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.

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 7 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.

For further guidance on the use of the vaccines mentioned below, see: <http://www.cdc.gov/vaccines/hcp/acip-recs/index.html>.

5. Haemophilus influenzae type b (Hib) conjugate vaccine (cont'd)

- For recommendations on the use of MenHibrix in patients at increased risk for meningococcal disease, please refer to the meningococcal vaccine footnotes and also to *MMWR* March 22, 2013; 62(RR02);1-22, available at <http://www.cdc.gov/mmwr/pdf/rr/rr6202.pdf>.

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 the first 2 doses were PRP-OMP (PedvaxHIB or COMVAX), and were administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 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, regardless of Hib vaccine used for first dose.
- If first dose is administered at younger than 12 months of age and second dose is given between 12 through 14 months of age, a third (and final) dose should be given 8 weeks later.
- For unvaccinated children aged 15 months or older, administer only 1 dose.
- For other catch-up guidance, see Figure 2. For catch-up guidance related to MenHibrix, please see the meningococcal vaccine footnotes and also *MMWR* March 22, 2013; 62(RR02);1-22, available at <http://www.cdc.gov/mmwr/pdf/rr/rr6202.pdf>.

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 12 months of age, should receive 2 additional doses of Hib vaccine 8 weeks apart; children who received 2 or more doses of Hib vaccine before 12 months of age should receive 1 additional dose.
- For patients younger than 5 years of age 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 splenectomy; if possible, vaccine should be administered at least 14 days before 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 unvaccinated persons 5 through 18 years of age with human immunodeficiency virus (HIV) infection.
** Patients who have not received a primary series and booster dose or at least 1 dose of Hib vaccine after 14 months of age are considered unimmunized.*

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

Routine vaccination with PCV13:

- Administer a 4-dose series of PCV13 vaccine at ages 2, 4, and 6 months and at age 12 through 15 months.
- For children aged 14 through 59 months who have received an age-appropriate series of 7-valent PCV (PCV7), administer a single supplemental dose of 13-valent PCV (PCV13).

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 2 through 5 years of age 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; cochlear implant; 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:
 - 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.

6. Pneumococcal vaccines (cont'd)

- Administer 1 supplemental dose of PCV13 if 4 doses of PCV7 or other age-appropriate complete PCV7 series was received previously.
- The minimum interval between doses of PCV (PCV7 or 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; 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:
 - If neither PCV13 nor PPSV23 has been received previously, administer 1 dose of PCV13 now and 1 dose of PPSV23 at least 8 weeks later.
 - 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.
 - 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 received previously, 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.

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 influenza vaccine annually to all children beginning at age 6 months. For most healthy, nonpregnant persons aged 2 through 49 years, either LAIV or IIV may be used. However, LAIV should NOT be administered to some persons, including 1) those with asthma, 2) children 2 through 4 years who had wheezing in the past 12 months, or 3) those who have any other underlying medical conditions that predispose them to influenza complications. For all other contraindications to use of LAIV, see *MMWR* 2013; 62 (No. RR-7):1-43, available at <http://www.cdc.gov/mmwr/pdf/rr/rr6207.pdf>.

For children aged 6 months through 8 years:

- For the 2013-14 season, administer 2 doses (separated by at least 4 weeks) to children who are receiving influenza vaccine for the first time. Some children in this age group who have been vaccinated previously will also need 2 doses. For additional guidance, follow dosing guidelines in the 2013-14 ACIP influenza vaccine recommendations, *MMWR* 2013; 62 (No. RR-7):1-43, available at <http://www.cdc.gov/mmwr/pdf/rr/rr6207.pdf>.
- For the 2014-15 season, follow dosing guidelines in the 2014 ACIP influenza vaccine recommendations.

For persons aged 9 years and older:

- Administer 1 dose.

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 *MMWR* 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 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.

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 HPV4 or HPV2 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 or Menactra, administer 2 primary doses of either Menactra or Menveo at least 2 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 initiated 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.
- For booster doses among persons with high-risk conditions, refer to *MMWR* 2013; 62(RR02);1-22, available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6202a1.htm>.

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 the first dose of MenHibrix is given at or after 12 months of age, a total of 2 doses should be given at least 8 weeks apart to ensure protection against serogroups C and Y meningococcal disease.
3. For children who initiate vaccination with Menveo 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.
4. For other catch-up recommendations for these persons, refer to *MMWR* 2013; 62(RR02);1-22, available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6202a1.htm>.

For complete information on use of meningococcal vaccines, including guidance related to vaccination of persons at increased risk of infection, see *MMWR* March 22, 2013; 62(RR02);1-22, available at <http://www.cdc.gov/mmwr/pdf/rr/rr6202.pdf>.

Meningococcal Vaccination Recommendations

This table summarizes the recommendations of CDC’s Advisory Committee on Immunization Practices for the use of meningococcal vaccine.

by Age and/or Risk Factor

MCV4 = Menactra (sanofi) and Menveo (Novartis)

MCV4-D = Menactra

MCV4-CRM = Menveo

Hib-MenCY = MenHibrix (GlaxoSmithKline)

MPSV = Menomune (sanofi)

Targeted group by age and/or risk factor	Primary dose(s)	Booster dose(s)
People ages 11 through 18 years	Give 1 dose of MCV4, preferably at age 11 or 12 years ¹	Give booster at age 16 years if primary dose given at age 12 years or younger
		Give booster dose at age 16 through 18 years if primary dose given at age 13 through 15 years ²
People ages 19 through 21 years who are first year college students living in residence halls	Give 1 dose of MCV4 ¹	Give booster if previous dose given at age younger than 16 years
Travelers to or residents of countries where meningococcal disease is hyperendemic or epidemic,³ people present during outbreaks caused by a vaccine serogroup,⁴ and other people with prolonged increased risk for exposure (e.g., microbiologists routinely working with <i>Neisseria meningitidis</i>)		
<ul style="list-style-type: none"> For children age 2 through 18 months 	Give MCV4-CRM at ages 2, 4, 6 and 12-15 months ⁵	If risk continues, give initial booster after 3 years followed by boosters every 5 years
<ul style="list-style-type: none"> For children age 7 through 23 months who have not initiated a series of MCV4-CRM or Hib-MenCY 	Give 2 doses, separated by 3 months, ⁶ of MCV4-CRM (if age 7-23 months) ⁷ or MCV4-D (if age 9-23 months)	
<ul style="list-style-type: none"> For age 2 through 55 years 	Give 1 dose of MCV4 ¹	Boost every 5 years with MCV4 ^{8,9}
<ul style="list-style-type: none"> For ages 56 years and older 	If no previous MCV4 dose and either short-term travel or outbreak-related, give 1 dose of MPSV; all others, give 1 dose of MCV4	Boost every 5 years with MCV4 ⁹
People with persistent complement component deficiencies¹⁰		
<ul style="list-style-type: none"> For age 2 through 18 months 	Give MCV4-CRM or Hib-MenCY at ages 2, 4, 6 and 12-15 months	Give MCV4 booster after 3 years followed by boosters every 5 years thereafter
<ul style="list-style-type: none"> For children age 7 through 23 months who have not initiated a series of MCV4-CRM or Hib-MenCY 	Give 2 doses, separated by 3 months, of MCV4-CRM (if age 7-23 months) ⁷ or MCV4-D (if age 9-23 months)	
<ul style="list-style-type: none"> For ages 2 through 55 years 	Give 2 doses of MCV4, 2 months apart	Boost every 5 years with MCV4 ^{8,11}
<ul style="list-style-type: none"> For age 56 years and older 	Give 2 doses of MCV4, 2 months apart	Boost every 5 years with MCV4 ¹¹
People with functional or anatomic asplenia, including sickle cell disease		
<ul style="list-style-type: none"> For age 2 through 18 months 	Give MCV4-CRM or Hib-MenCY at ages 2, 4, 6 and 12-15 months	Give MCV4 booster after 3 years followed by boosters every 5 years thereafter
<ul style="list-style-type: none"> For children age 19 through 23 months who have not initiated a series of MCV4-CRM or HibMenCY 	Give 2 doses of MCV4-CRM, 3 months apart	
<ul style="list-style-type: none"> For ages 2 through 55 years 	Give 2 doses of MCV4, 2 months apart ¹²	Boost every 5 years with MCV4 ^{8,11}
<ul style="list-style-type: none"> For ages 56 years and older 	Give 2 doses of MCV4, 2 months apart	Boost every 5 years with MCV4 ¹¹

FOOTNOTES

- If the person is HIV-positive, give 2 doses, 2 months apart
- The minimum interval between doses of MCV4 is 8 weeks.
- Prior receipt of Hib-MenCY is not sufficient for children traveling to the Hajj or African meningitis belt as it doesn't provide protection against serogroups A or W.
- Seek advice of local public health authorities to determine if vaccination is recommended.
- Children age 2 through 18 months who are present during outbreaks caused by serogroups C or Y may be given an age-appropriate series of Hib-MenCY.
- If a child age 7 through 23 months will enter an endemic area in less than 3 months, give doses as close as 2 months apart.
- If using MCV4-CRM, dose 2 should be given no younger than age 12 months.
- If primary dose(s) given when younger than age 7 years, give initial booster after 3 years, followed by boosters every 5 years.
- Booster doses are recommended if the person remains at increased risk.
- Persistent complement component deficiencies include C3, C5-C9, properdin, factor H, and factor D.
- If the person received a 1-dose primary series, give booster at the earliest opportunity, then boost every 5 years.
- Children with functional or anatomic asplenia should complete an age-appropriate series of PCV13 vaccine before vaccination with MCV4-D; MCV4-D should be given at least 4 weeks following last dose of PCV13. MCV4-CRM or Hib-MenCY may be given at any time before or after PCV13.

Adapted from www.immunize.org/catg.d/p2018.pdf on February 14, 2014. We thank the Immunization Action Coalition.

Immunization Best Practices

1. Vaccinate staff.

Vaccinate all personnel who have contact with patients with all recommended vaccines.

2. Assess at every visit.

Review immunization status and administer **all** immunizations due at **all** types of visits (e.g., acute care and well child).

3. Schedule optimally.

- Hepatitis B: Give first dose at birth.
- Give any dose of vaccine not given at the recommended age at any following visit when indicated and feasible.
- Schedule immunizations prior to the maximum ACIP recommended age to ensure that children have received all of the recommended antigens by age 24 months.
- No research indicates “alternative schedules” or delaying vaccines is safer than the recommended schedule. Experts agree the best time to give immunizations to ensure infants are protected is as soon as possible. For help talking to parents about vaccine concerns, see this article by Ari Brown, MD: www.immunize.org/catg.d/p2068.pdf, or CDC’s website: www.cdc.gov/vaccines/hcp/patient-ed/conversations/index.html

4. Adhere to correct intervals at ages.

(a) Minimum intervals:

- Do **not** give vaccines before the recommended minimum age or interval for that antigen.
- Consider doses administered before the minimum age and/or minimum interval invalid.
- If an invalid dose has been given, count from the last (invalid) dose in order to determine when to give the next **valid** dose.

(b) Maximum intervals:

- There are no maximum intervals; it is **not** necessary to restart the series of any vaccine due to extended intervals between doses.

5. Follow only true contraindications.

Do not defer vaccination for children who present with a mild acute illness, with or without fever. Follow only true contraindications as outlined by the ACIP.

6. Use Vaccine Information Statements (VIS).

Provide patient, parent, or legal representative with a copy of the VIS with **each** dose of vaccine administered, and answer questions regarding vaccine risks and benefits. It is the provider’s responsibility to maintain copies of the most up to date VISs in their office. Subscribe to CDC’s e-mail update for VISs at www.cdc.gov/vaccines/hcp/vis/index.html, click on “Get E-Mail Updates,” and enter your e-mail address. Many other resources are available to help address questions about vaccine safety (see box below).

7. Give all vaccines due.

There are **no** contraindications to simultaneous administration of any of the recommended childhood vaccines.

8. Document.

- Document in the patient’s record the date a patient moves or goes elsewhere for care (MOGE).
- Document chickenpox disease on the immunization record.
- Document contraindications to vaccines.
- Document parent refusal or deferral of any vaccine.
- Provide the patient or parent/legal guardian with an immunization card documenting the vaccines given and the date the next doses are due.

9. Carry out reminder/recall.

- Identify children who are due or overdue for immunizations (e.g., MIIS, EHR, computer billing system, other electronic tracking systems, tickler system, stickers on charts).
- Send out reminder or recall notices **at least twice a year**
- Verify patient’s address and telephone number at each encounter; obtain a second contact number for back-up.

10. Develop a systematic approach.

- Designate an *Immunization Coordinator* to coordinate and monitor all immunization activities. The *Immunization Coordinator* keeps current with information about immunization, and communicates current schedules, guidelines, and policies to all staff.
- Have all providers in a practice formally agree to adhere to a common immunization schedule (based on ACIP guidelines).
- Post agreed upon common schedule throughout the practice.

11. Follow appropriate procedures for vaccine storage and handling.

- Formally designate one staff member to monitor vaccine ordering, receiving and storage.
- Consult the MDPH document *Guidelines for Compliance with Federal and State Vaccine Administration Requirements* for detailed instructions on proper vaccine storage and handling.
- Maintain up-to-date, written protocols for vaccine storage and handling procedures and share with all staff who handle vaccine.

12. Report adverse events.

Report clinically significant adverse events that follow immunization to the Vaccine Adverse Event Reporting System (VAERS). Find guidance on obtaining and completing a VAERS form at: www.vaers.hhs.gov or by calling 1-800-822-7967.

13. Report cases.

Report suspect cases of vaccine-preventable diseases to your local board of health and to the MDPH Immunization Program, 617-983-6800 or toll free 888-658-2850. For information regarding disease reporting and control measures see the *Guide to Surveillance and Reporting* (www.mass.gov/dph/epi).

Adapted from: National Vaccine Advisory Committee. *Standards for Child and Adolescent Immunization Practices*. Pediatrics. 2003;112:958-963.

Resources:

Massachusetts Department of Public Health (DPH): www.mass.gov/dph/imm, 888-658-2850 or 617-983-6800

National Immunization Information Hotline: 1-800-232-4636 (1-800-CDC-INFO) and 1-888-232-6348 (TTY)

National Immunization Program: www.cdc.gov/vaccines Immunization Action Coalition: www.immunize.org

Children’s Hospital of Philadelphia Vaccine Education Center: www.chop.edu/service/vaccine-education-center

American Academy of Pediatrics: www.aap.org

Massachusetts School Immunization Requirements for School Year 2014-2015*

	Child Care/Preschool ¹	Kindergarten	Grades 1-6	Grades 7-12	College ²
Hepatitis B³	3 doses	3 doses	3 doses	3 doses	3 doses for all health science students and full-time undergraduate and graduate students
DTaP/DTP/DT/Td/Tdap⁴	≥4 doses DTaP/DTP	5 doses DTaP/DTP	≥4 doses DTaP/DTP or ≥3 doses Td	4 doses DTaP/DTP or ≥3 doses Td; plus 1 dose Tdap (See Phase-In Schedule)	All health science students and full-time freshmen-seniors: 1 dose Tdap Full-time graduates: 1 dose Td (See Phase-In Schedule)
Polio⁵	≥3 doses	4 doses	≥3 doses	≥3 doses	NA
Hib⁶	1 to 4 doses ⁶	NA	NA	NA	NA
MMR⁷	1 dose	2 doses	Grade 1-3: 2 doses Grades 4-6: 2 doses measles, 1 mumps, 1 rubella (See Phase-In Schedule)	Grades 7-10: 2 doses Grades 11-12: 2 doses measles, 1 mumps, 1 rubella (See Phase-In Schedule)	All health science students and full-time freshmen-seniors: 2 doses Full-time graduates: 2 doses measles, 1 mumps, 1 rubella (See Phase-In Schedule)
Varicella⁸	1 dose	2 doses	Grade 1-3: 2 doses Grades 4-6: 1 dose (See Phase-In Schedule)	Grades 7-10: 2 doses Grades 11-12: 1 dose (See Phase-In Schedule)	All health science students and full-time freshmen-seniors: 2 doses (See Phase-In Schedule)
Meningococcal^{9,10}	NA	NA	NA ¹⁰	1 dose for new full-time residential students ⁹	1 dose for full-time residential students ⁹

*These requirements also apply to all new “enterers.” NA = no vaccine requirement for the grades indicated.

¹**Child Care/Preschool:** Minimum requirements by 24 months; immunize younger children according to their age.

²**College:** Requirements apply to: 1) all full-time undergraduate and graduate students; 2) all full-time and part-time health science students; and 3) any full-time or part-time student attending any postsecondary institution while on a student or other visa, including foreign students attending or visiting classes as part of a formal academic visitation or exchange program.

³**Hepatitis B:** 3 doses required for child care attendance and preschool entry, kindergarten-12th grade, and college (see footnote 2 above). Laboratory proof of immunity is acceptable.

⁴**DTaP/DTP/DT/Td/Tdap:** ≥4 doses required for child care attendance and preschool entry; 5 doses of DTaP/DTP required for school entry unless the 4th dose is given ≥ the 4th birthday. DT is only acceptable with a letter stating a medical contraindication to DTaP/DTP. **One dose of Tdap is required for all students entering grade 7-10, full-time college freshmen-seniors and all health science students.** If it has been <5 years since the last dose of DTaP/DTP/DT/Td, Tdap is not required but is recommended regardless of the interval since the last tetanus-containing vaccine. See Phase-In Schedule below.

⁵**Polio:** ≥3 doses required for child care attendance and entry into preschool. 4 doses required for school entry, unless the 3rd dose is given on or after the 4th birthday, and ≥ 6 months following the previous dose, in which case only 3 doses are needed. Administer the final dose in the series on or after the 4th birthday and ≥ 6 months following the previous dose. If 4 doses are administered before age 4 years, a 5th dose is recommended at age 4 - 6 years.

⁶**Hib:** Required for child care attendance and preschool entry. The number of doses is determined by vaccine product and age the series begins.

⁷**MMR:** 1 dose of MMR is required for child care attendance and preschool entry; **2 doses are required for kindergarten-grade 3, grade 7-10, college freshmen-seniors and all health science students.** Laboratory proof of immunity is acceptable. **For college students, except health science students, birth before 1957 in the U.S. is also acceptable.** See Phase-In Schedule below.

⁸**Varicella:** 1 dose required for child care attendance and preschool entry; **2 doses required for kindergarten-grade 3, grade 7-10, and college freshmen-seniors and all health science students, unless they have a reliable history of chickenpox.** A reliable history includes a diagnosis of chickenpox, or interpretation of parent/guardian description of chickenpox, by a physician, nurse practitioner, physician assistant or designee; or 2) laboratory proof of immunity. **Birth before 1980 in U.S. is acceptable for college students, except health science students.** See Phase-In Schedule below.

⁹**Meningococcal:** 1 dose MCV4, or a dose of MPSV4 in the last 5 years, is required for 1) newly enrolled full-time students attending a secondary school with grades 9-12 (in ungraded classrooms, those with students ≥ 13 years) who will live in a dormitory or comparable congregate living arrangement approved by the secondary school; and 2) newly enrolled full-time undergraduate and graduate students in a degree program at a postsecondary institution (e.g., college) who will live in a dormitory or comparable congregate living arrangement approved by the institution.

Students may decline the vaccine after they have read and signed the MDPH Meningococcal Information and Waiver Form provided by their institution. These requirements apply to newly-enrolled full-time residential students, regardless of grade and year of study.

¹⁰**At residential schools with lower grades:** The requirements apply to residential students in grades pre-K through 8 only if the school combines these grades in the same school with students in grades 9-12

Phase-In Schedule for MMR, Varicella, and Tdap Vaccines 2014 - 2017

	2014	2015	2016	2017
2 MMR and 2 Varicella	K-3 and 7-10 College: full-time freshmen-seniors; all health science	K-4 and 7-11 College: full-time freshmen-graduates; all health science	K-5 and 7-12 College: full-time freshmen-graduates; all health science	K-12 College: full-time freshmen-graduates; all health science
Tdap	Grades 7-10 College: full-time freshmen-seniors; all health science	Grades 7-11 College: full-time freshmen-graduates; all health science	Grades 7-12 College: full-time freshmen-graduates; all health science	Grades 7-12 College: full-time freshmen-graduates; all health science