

# Recommended Immunization Schedules for Persons Aged 0–18 Years — United States, 2008

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The Advisory Committee on Immunization Practices (ACIP) annually publishes a recommended immunization schedule for persons aged 0–18 years to reflect changes in vaccine formulations and current recommendations for the use of licensed vaccines. Changes to the previous schedule (1) are as follows:

- The pneumococcal conjugate vaccine (PCV) footnote reflects updated recommendations for incompletely vaccinated children aged 24–59 months, including those with underlying medical conditions (2).
- Recommendations for use of the live attenuated influenza vaccine (LAIV) now include healthy children aged as young as 2 years. LAIV should not be administered to children aged <5 years with recurrent wheezing (3). Children aged <9 years who are receiving influenza vaccine for the first time or who were vaccinated for the first time last season, but only received 1 dose, should have 2 doses of vaccine, at least 4 weeks apart. Other updates are included (4).
- For meningococcal vaccines, changes affect certain children aged 2–10 years (5). Vaccinating with meningococcal conjugate vaccine (MCV4) is preferred to meningococcal polysaccharide vaccine (MPSV4) for children at increased risk for meningococcal disease, including children who are traveling to or residents of countries in which the disease is hyperendemic or epidemic, children who have terminal complement component deficiencies, and children who have anatomic or functional asplenia. The catch-up schedule for youths aged 13–18 years has been updated. MPSV4 is an acceptable alternative for short-term (i.e., 3–5 years) protection against meningococcal disease for persons aged 2–18 years (6).
- The tetanus and diphtheria toxoids/tetanus and diphtheria toxoids and acellular pertussis vaccine (Td/Tdap) catch-up schedule for persons aged 7–18 years who received their first dose before age 12 months now indicates that these youths should receive 4 doses, with at least 4 weeks (not 8 weeks) between doses 2 and 3.
- The catch-up bars for hepatitis B and *Haemophilus influenzae* type b conjugate vaccine have been deleted on the routine schedule for persons aged 0–6 years (Figure 1). The figure title refers users to the catch-up schedule (Table) for patients who fall behind or start late with vaccinations.

The National Childhood Vaccine Injury Act requires that health-care providers provide parents or patients with copies of Vaccine Information Statements before administering each dose of the vaccines listed in the schedule. Additional information is available from state health departments and from CDC at <http://www.cdc.gov/vaccines/pubs/vis/default.htm>.

Detailed recommendations for using vaccines are available from package inserts, ACIP statements (available at <http://www.cdc.gov/vaccines/pubs/acip-list.htm>), and the *2006 Red Book* (7). Guidance regarding the Vaccine Adverse Event Reporting System form is available at <http://www.vaers.hhs.gov> or by telephone, 800-822-7967.

## References

1. CDC. Recommended childhood and adolescent immunization schedule—United States. MMWR 2007;55(51&52):Q1–Q4.
2. CDC. Revised recommendations of the Advisory Committee on Immunization Practices (ACIP) for the prevention of pneumococcal disease. Atlanta, GA: US Department of Health and Human Services, CDC; 2007. Available at [http://www.cdc.gov/vaccines/recs/acip/downloads/min\\_oct07.pdf](http://www.cdc.gov/vaccines/recs/acip/downloads/min_oct07.pdf)
3. CDC. Expansion of use of live attenuated influenza vaccine (FluMist®) to children aged 2–4 years and other FluMist changes for the 2007–08 influenza season. MMWR 2007;56:1217–9.
4. CDC. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2007;56(No. RR-6).
5. CDC. Recommendation from the Advisory Committee on Immunization Practices (ACIP) for use of quadrivalent meningococcal conjugate vaccine (MCV4) in children aged 2–10 years at increased risk for invasive meningococcal disease. MMWR 2007;56:1265–6.
6. CDC. Revised recommendations of the Advisory Committee on Immunization Practices (ACIP) to vaccinate all persons aged 11–18 years with meningococcal conjugate vaccine. MMWR 2007;56:794–5.
7. American Academy of Pediatrics. Active and passive immunization. In: Pickering LK, ed. 2006 red book: report of the Committee on Infectious Diseases. 27th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006.

The recommended immunization schedules for persons aged 0–18 years and the catch-up immunization schedule for 2008 have been approved by the Advisory Committee on Immunization Practices, the American Academy of Pediatrics, and the American Academy of Family Physicians. The standard MMWR footnote format has been modified for publication of this schedule.

Suggested citation: Centers for Disease Control and Prevention. Recommended immunization schedules for persons aged 0–18 years—United States, 2008. MMWR 2007;56(51&52):Q1–Q4.

**FIGURE 1. Recommended immunization schedule for persons aged 0–6 years — United States, 2008**  
(for those who fall behind or start late, see the catch-up schedule [Table])

Vaccine ▼	Age ▶	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B <sup>1</sup>	HepB	HepB	HepB	See footnote 1	HepB							
Rotavirus <sup>2</sup>			Rota	Rota	Rota							
Diphtheria, Tetanus, Pertussis <sup>3</sup>			DTaP	DTaP	DTaP	See footnote 3	DTaP					
<i>Haemophilus influenzae</i> type b <sup>4</sup>			Hib	Hib	Hib <sup>4</sup>	Hib						
Pneumococcal <sup>5</sup>			PCV	PCV	PCV	PCV					PPV	
Inactivated Poliovirus			IPV	IPV	IPV						IPV	
Influenza <sup>6</sup>			Influenza (Yearly)									
Measles, Mumps, Rubella <sup>7</sup>						MMR					MMR	
Varicella <sup>8</sup>						Varicella					Varicella	
Hepatitis A <sup>9</sup>						HepA (2 doses)					HepA Series	
Meningococcal <sup>10</sup>												MCV4

Range of recommended ages

Certain high-risk groups

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2007, for children aged 0–6 years. Additional information is available at <http://www.cdc.gov/vaccines/recs/schedules>. Any dose not administered at the recommended age should be administered at any subsequent visit, when indicated and feasible. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever any components of the combination are indicated and other components of the vaccine are not contraindicated and if approved by the Food and Drug

Administration for that dose of the series. Providers should consult the respective Advisory Committee on Immunization Practices statement for detailed recommendations, including for **high-risk conditions**: <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at <http://www.vaers.hhs.gov> or by telephone, 800-822-7967.

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

##### At birth:

- Administer monovalent HepB to all newborns before hospital discharge.
- If mother is hepatitis surface antigen (HBsAg)-positive, administer HepB and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth.
- If mother's HBsAg status is unknown, administer HepB within 12 hours of birth. Determine the HBsAg status as soon as possible and if HBsAg-positive, administer HBIG (no later than age 1 week).
- If mother is HBsAg-negative, the birth dose should only be delayed, in rare cases, with health-care-provider's order and a copy of the mother's negative HBsAg laboratory report documented in the infant's medical record.

##### After the birth dose:

- The HepB series should be completed with either monovalent HepB or a combination vaccine containing HepB. The second dose should be administered at age 1–2 months. The final dose should be administered no earlier than age 24 weeks. Infants born to HBsAg-positive mothers should be tested for HBsAg and antibody to HBsAg after completion of at least 3 doses of a licensed HepB series, at age 9–18 months (generally at the next well-child visit).

##### 4-month dose:

- It is permissible to administer 4 doses of HepB when combination vaccines are administered after the birth dose. If monovalent HepB is used for doses after the birth dose, a dose at age 4 months is not needed.

#### 2. Rotavirus vaccine (Rota). (Minimum age: 6 weeks)

- Administer the first dose at age 6–12 weeks.
- Do not start the series later than age 12 weeks.
- Administer the final dose in the series by age 32 weeks. Do not administer a dose later than age 32 weeks.
- Data on safety and efficacy outside of these age ranges are insufficient.

#### 3. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP). (Minimum age: 6 weeks)

- The fourth dose of DTaP may be administered as early as age 12 months, provided 6 months have elapsed since the third dose.
- Administer the final dose in the series at age 4–6 years.

#### 4. *Haemophilus influenzae* type b conjugate vaccine (Hib). (Minimum age: 6 weeks)

- If PRP-OMP (PedvaxHIB<sup>®</sup> or ComVax<sup>®</sup> [Merck]) is administered at ages 2 and 4 months, a dose at age 6 months is not required.
- TriHIBit<sup>®</sup> (DTaP/Hib) combination products should not be used for primary immunization but can be used as boosters after any Hib vaccine in children aged >12 months.

#### 5. Pneumococcal vaccine. (Minimum age: 6 weeks for pneumococcal conjugate vaccine [PCV]; 2 years for pneumococcal polysaccharide vaccine [PPV])

- Administer 1 dose of PCV to all healthy children aged 24–59 months having any incomplete schedule.
- Administer PPV to children aged ≥2 years with underlying medical conditions.

#### 6. Influenza vaccine. (Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 2 years for live, attenuated influenza vaccine [LAIV])

- Administer annually to children aged 6–59 months and to all eligible close contacts of children aged 0–59 months.
- Administer annually to children aged ≥5 years with certain risk factors, to other persons (including household members) in close contact with persons in groups at higher risk, and to any child whose parents request vaccination.
- For healthy persons (i.e., those who do not have underlying medical conditions that predispose them to influenza complications) aged 2–49 years, either LAIV or TIV may be used.
- Children receiving TIV should receive 0.25 mL if aged 6–35 months or 0.5 mL if aged ≥3 years.
- Administer 2 doses (separated by ≥4 weeks) to children aged <9 years who are receiving influenza vaccine for the first time or who were vaccinated for the first time last season but only received 1 dose.

#### 7. Measles, mumps, and rubella vaccine (MMR). (Minimum age: 12 months)

- Administer the second dose of MMR at age 4–6 years. MMR may be administered before age 4–6 years, provided ≥4 weeks have elapsed since the first dose.

#### 8. Varicella vaccine. (Minimum age: 12 months)

- Administer the second dose of varicella vaccine at age 4–6 years; may be administered ≥3 months after first dose.
- Do not repeat second dose if administered ≥28 days after first dose.

#### 9. Hepatitis A vaccine (HepA). (Minimum age: 12 months)

- Administer to all children aged 1 year (i.e., aged 12–23 months). Administer the 2 doses in the series at least 6 months apart.
- Children not fully vaccinated by age 2 years can be vaccinated at subsequent visits.
- HepA is recommended for certain other groups of children, including in areas where vaccination programs target older children.

#### 10. Meningococcal vaccine. (Minimum age: 2 years for meningococcal conjugate vaccine [MCV4] and for meningococcal polysaccharide vaccine [MPSV4])

- Administer MCV4 to children aged 2–10 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high-risk groups. MPSV4 also is acceptable.
- Administer MCV4 to persons who received MPSV4 ≥3 years previously and remain at increased risk for meningococcal disease.

**FIGURE 2. Recommended immunization schedule for persons aged 7–18 years — United States, 2008**  
(for those who fall behind or start late, see the schedule below and the catch-up schedule [Table])

Vaccine ▼	Age ►	7–10 years	11–12 years	13–18 years	
Diphtheria, Tetanus, Pertussis <sup>1</sup>		See footnote 1	Tdap	Tdap	Range of recommended ages
Human Papillomavirus <sup>2</sup>		See footnote 2	HPV (3 doses)	HPV Series	
Meningococcal <sup>3</sup>		MCV4	MCV4	MCV4	Catch-up immunization
Pneumococcal <sup>4</sup>		PPV			
Influenza <sup>5</sup>		Influenza (Yearly)			Certain high-risk groups
Hepatitis A <sup>6</sup>		HepA Series			
Hepatitis B <sup>7</sup>		HepB Series			
Inactivated Poliovirus <sup>8</sup>		IPV Series			
Measles, Mumps, Rubella <sup>9</sup>		MMR Series			
Varicella <sup>10</sup>		Varicella Series			

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2007, for children aged 7–18 years. Additional information is available at <http://www.cdc.gov/vaccines/recs/schedules>. Any dose not administered at the recommended age should be administered at any subsequent visit, when indicated and feasible. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever any components of the combination are indicated and other components of the vaccine are not contraindicated and if approved by the Food and Drug

Administration for that dose of the series. Providers should consult the respective Advisory Committee on Immunization Practices statement for detailed recommendations, including for **high-risk conditions**: <http://www.cdc.gov/vaccines/pubs/acip-list.htm>. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at <http://www.vaers.hhs.gov> or by telephone, 800-822-7967.

**1. Tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap).** (Minimum age: 10 years for BOOSTRIX<sup>®</sup> and 11 years for ADACEL<sup>™</sup>)

- Administer at age 11–12 years for those who have completed the recommended childhood DTP/DTPaP vaccination series and have not received a tetanus and diphtheria toxoids vaccine (Td) booster dose.
- Adolescents aged 13–18 years who missed the 11–12 year Tdap dose or received Td only are encouraged to receive 1 dose of Tdap 5 years after the last Td/DTPaP dose.

**2. Human papillomavirus vaccine (HPV).** (Minimum age: 9 years)

- Administer the first dose of the HPV vaccine series to females at age 11–12 years.
- Administer the second dose 2 months after the first dose and the third dose 6 months after the first dose.
- Administer the HPV vaccine series to females at age 13–18 years if not previously vaccinated.

**3. Meningococcal vaccine.**

- Administer meningococcal conjugate vaccine (MCV4) at age 11–12 years and at age 13–18 years if not previously vaccinated. Meningococcal polysaccharide vaccine (MPSV4) is an acceptable alternative.
- Administer MCV4 to previously unvaccinated college freshmen living in dormitories.
- MCV4 is recommended for children aged 2–10 years with terminal complement deficiencies or anatomic or functional asplenia and certain other groups at high risk.
- Persons who received MPSV4  $\geq 3$  years previously and remain at increased risk for meningococcal disease should be vaccinated with MCV4.

**4. Pneumococcal polysaccharide vaccine (PPV).**

- Administer to certain groups at high risk.

**5. Influenza vaccine.**

- Administer annually to all close contacts of children aged 0–59 months.
- Administer annually to person with certain risk factors, health-care workers, and other persons (including household members) in close contact with persons in groups at higher risk.
- Administer 2 doses (separated by  $\geq 4$  weeks) to children aged <9 years who are receiving influenza vaccine for the first time or who were vaccinated for the first time last season but only received 1 dose.
- For healthy nonpregnant persons (i.e., those who do not have underlying medical conditions that predispose them to influenza complications) aged 2–49 years, either LAIV or TIV may be used.

**6. Hepatitis A vaccine (HepA).**

- Administer 2 doses in the series at least 6 months apart.
- HepA is recommended for certain other groups of children, including in areas where vaccination programs target older children.

**7. Hepatitis B vaccine (HepB).**

- Administer the 3-dose series to those who were not previously vaccinated.
- A 2-dose series of Recombivax HB<sup>®</sup> is licensed for children aged 11–15 years.

**8. Inactivated poliovirus vaccine (IPV).**

- For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if the third dose was administered at age  $\geq 4$  years.
- 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.

**9. Measles, mumps, and rubella vaccine (MMR).**

- If not previously vaccinated, administer 2 doses of MMR during any visit, with  $\geq 4$  weeks between the doses.

**10. Varicella vaccine.**

- Administer 2 doses of varicella vaccine to persons aged <13 years at least 3 months apart. Do not repeat the second dose, if administered  $\geq 28$  days after the first dose.
- Administer 2 doses of varicella vaccine to persons aged  $\geq 13$  years at least 4 weeks apart.

**TABLE. Catch-up immunization schedule for persons aged 4 months–18 years who start late or who are  $\geq 1$  month behind — United States, 2008**

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

CATCH-UP SCHEDULE FOR PERSONS AGED 4 MONTHS–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 <sup>1</sup>	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Rotavirus <sup>2</sup>	6 weeks	4 weeks	4 weeks		
Diphtheria, Tetanus, Pertussis <sup>3</sup>	6 weeks	4 weeks	4 weeks	6 months	6 months <sup>5</sup>
<i>Haemophilus influenzae</i> type b <sup>4</sup>	6 weeks	4 weeks if first dose administered at age <12 months 8 weeks (as final dose) if first dose administered at age 12–14 months No further doses needed if first dose administered at age $\geq 15$ months	4 weeks <sup>4</sup> if current age <12 months 8 weeks (as final dose) <sup>4</sup> if current age $\geq 12$ months and second dose administered at age <15 months No further doses needed if previous dose administered at age $\geq 15$ months	8 weeks (as final dose) This dose only necessary for children aged 12 months–5 years who received 3 doses before age 12 months	
Pneumococcal <sup>5</sup>	6 weeks	4 weeks if first dose administered at age <12 months 8 weeks (as final dose) if first dose administered at age $\geq 12$ months or current age 24–59 months No further doses needed for healthy children if first dose administered at age $\geq 24$ months	4 weeks if current age <12 months 8 weeks (as final dose) if current age $\geq 12$ months No further doses needed for healthy children if previous dose administered at age $\geq 24$ months	8 weeks (as final dose) This dose only necessary for children aged 12 months–5 years who received 3 doses before age 12 months	
Inactivated Poliovirus <sup>6</sup>	6 weeks	4 weeks	4 weeks	4 weeks <sup>6</sup>	
Measles, Mumps, Rubella <sup>7</sup>	12 months	4 weeks			
Varicella <sup>8</sup>	12 months	3 months			
Hepatitis A <sup>9</sup>	12 months	6 months			
CATCH-UP SCHEDULE FOR PERSONS AGED 7–18 YEARS					
Tetanus, Diphtheria/ Tetanus, Diphtheria, Pertussis <sup>10</sup>	7 years <sup>10</sup>	4 weeks	4 weeks if first dose administered at age <12 months 6 months if first dose administered at age $\geq 12$ months	6 months if first dose administered at age <12 months	
Human Papillomavirus <sup>11</sup>	9 years	4 weeks	12 weeks		
Hepatitis A <sup>9</sup>	12 months	6 months			
Hepatitis B <sup>1</sup>	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Inactivated Poliovirus <sup>6</sup>	6 weeks	4 weeks	4 weeks	4 weeks <sup>6</sup>	
Measles, Mumps, Rubella <sup>7</sup>	12 months	4 weeks			
Varicella <sup>8</sup>	12 months	4 weeks if first dose administered at age $\geq 13$ years 3 months if first dose administered at age <13 years			

**1. Hepatitis B vaccine (HepB).**

- Administer the 3-dose series to those who were not previously vaccinated.
- A 2-dose series of Recombivax HB<sup>®</sup> is licensed for children aged 11–15 years.

**2. Rotavirus vaccine (Rota).**

- Do not start the series later than age 12 weeks.
- Administer the final dose in the series by age 32 weeks.
- Do not administer a dose later than age 32 weeks.
- Data on safety and efficacy outside of these age ranges are insufficient.

**3. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP).**

- The fifth dose is not necessary if the fourth dose was administered at age  $\geq 4$  years.
- DTaP is not indicated for persons aged  $\geq 7$  years.

**4. *Haemophilus influenzae* type b conjugate vaccine (Hib).**

- Vaccine is not generally recommended for children aged  $\geq 5$  years.
- If current age <12 months and the first 2 doses were PRP-OMP (PedvaxHIB<sup>®</sup> or ComVax<sup>®</sup> [Merck]), the third (and final) dose should be administered at age 12–15 months and at least 8 weeks after the second dose.
- If first dose was administered at age 7–11 months, administer 2 doses separated by 4 weeks plus a booster at age 12–15 months.

**5. Pneumococcal conjugate vaccine (PCV).**

- Administer 1 dose of PCV to all healthy children aged 24–59 months having any incomplete schedule.
- For children with underlying medical conditions, administer 2 doses of PCV at least 8 weeks apart if previously received <3 doses or 1 dose of PCV if previously received 3 doses.

**6. Inactivated poliovirus vaccine (IPV).**

- For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if third dose was administered at age  $\geq 4$  years.

- 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 persons aged  $\geq 18$  years.

**7. Measles, mumps, and rubella vaccine (MMR).**

- The second dose of MMR is recommended routinely at age 4–6 years but may be administered earlier if desired.
- If not previously vaccinated, administer 2 doses of MMR during any visit with  $\geq 4$  weeks between the doses.

**8. Varicella vaccine.**

- The second dose of varicella vaccine is recommended routinely at age 4–6 years but may be administered earlier if desired.
- Do not repeat the second dose in persons aged <13 years if administered  $\geq 28$  days after the first dose.

**9. Hepatitis A vaccine (HepA).**

- HepA is recommended for certain groups of children, including in areas where vaccination programs target older children. See *MMWR* 2006;55(No. RR-7).

**10. Tetanus and diphtheria toxoids vaccine (Td) and tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap).**

- Tdap should be substituted for a single dose of Td in the primary catch-up series or as a booster if age appropriate; use Td for other doses.
- A 5-year interval from the last Td dose is encouraged when Tdap is used as a booster dose. A booster (fourth) dose is needed if any of the previous doses were administered at age <12 months. See *MMWR* 2006;55(No. RR-3).

**11. Human papillomavirus vaccine (HPV).**

- Administer the HPV vaccine series to females at age 13–18 years if not previously vaccinated.

Information about reporting reactions after immunization is available online at <http://www.vaers.hhs.gov> or by telephone via the 24-hour national toll-free information line 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 immunization, is available from the National Center for Immunization and Respiratory Diseases at <http://www.cdc.gov/vaccines> or telephone, 800-CDC-INFO (800-232-4636).