

# Recommended Immunization Schedules for Persons Aged 0–18 Years — United States, 2007

**MMWR**<sup>TM</sup>  
**QuickGuide**

Weekly

January 5, 2007 / Vol. 55 / Nos. 51 & 52

The Advisory Committee on Immunization Practices (ACIP) periodically reviews the recommended immunization schedule for persons aged 0–18 years to ensure that the schedule is current with changes in vaccine formulations and reflects revised recommendations for the use of licensed vaccines, including those newly licensed.

The changes to the previous childhood and adolescent immunization schedule, published January 2006 (1), are as follows:

- The new rotavirus vaccine (Rota) is recommended in a 3-dose schedule at ages 2, 4, and 6 months. The first dose should be administered at ages 6 weeks through 12 weeks with subsequent doses administered at 4–10 week intervals. Rotavirus vaccination should not be initiated for infants aged >12 weeks and should not be administered after age 32 weeks (2).
- The influenza vaccine is now recommended for all children aged 6–59 months (3).
- Varicella vaccine recommendations are updated. The first dose should be administered at age 12–15 months, and a newly recommended second dose should be administered at age 4–6 years (4).
- The new human papillomavirus vaccine (HPV) is recommended in a 3-dose schedule with the second and third doses administered 2 and 6 months after the first dose. Routine vaccination with HPV is recommended for females aged 11–12 years; the vaccination series can be started in females as young as age 9 years; and a catch-up vaccination is recommended for females aged 13–26 years who have not been vaccinated previously or who have not completed the full vaccine series (5).

- The main change to the format of the schedule is the division of the recommendation into two schedules: one schedule for persons aged 0–6 years (Figure 1) and another for persons aged 7–18 years (Figure 2). Special populations are represented with purple bars; the 11–12 years assessment is emphasized with the bold, capitalized fonts in the title of that column. Rota, HPV, and varicella vaccines are incorporated in the catch-up immunization schedule (Table).

## Vaccine Information Statements

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/nip/publications/vis>.

Detailed recommendations for using vaccines are available from package inserts, ACIP statements on specific vaccines, and the *2003 Red Book* (6). ACIP statements for each recommended childhood vaccine are available from CDC at <http://www.cdc.gov/nip/publications/acip-list.htm>. In addition, guidance for obtaining and completing a 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* 2006;54(52):Q1–Q4.
2. CDC. Prevention of rotavirus gastroenteritis among infants and children. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2006;55(No. RR-12):1–13.
3. CDC. Prevention and control of influenza. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2006;55(No. RR-10):1–42.
4. CDC. ACIP provisional recommendations for the prevention of varicella. Available at [http://www.cdc.gov/nip/vaccine/varicella/varicella\\_acip\\_recs\\_prov\\_june\\_2006.pdf](http://www.cdc.gov/nip/vaccine/varicella/varicella_acip_recs_prov_june_2006.pdf).
5. CDC. ACIP provisional recommendations for the use of quadrivalent HPV vaccine. Available at [http://www.cdc.gov/nip/recs/provisional\\_recs/hpv.pdf](http://www.cdc.gov/nip/recs/provisional_recs/hpv.pdf).
6. American Academy of Pediatrics. Active and passive immunization. In: Pickering LK, ed. *2003 red book: report of the Committee on Infectious Diseases*. 26th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2003.

The recommended immunization schedules for persons aged 0–18 years and the catch-up immunization schedule for 2007 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, 2007. *MMWR* 2006;55(51&52):Q1–Q4.

FIGURE 1. Recommended immunization schedule for persons aged 0–6 years — United States, 2007

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	See footnote 1	HepB	HepB	HepB	HepB	HepB	HepB Series				Range of recommended ages
Rotavirus <sup>2</sup>				Rota	Rota	Rota								
Diphtheria, Tetanus, Pertussis <sup>3</sup>				DTaP	DTaP	DTaP		DTaP				DTaP		Catch-up immunization
<i>Haemophilus influenzae</i> type b <sup>4</sup>				Hib	Hib	Hib <sup>4</sup>	Hib	Hib	Hib					
Pneumococcal <sup>5</sup>				PCV	PCV	PCV	PCV	PCV			PCV	PPV		Certain high-risk groups
Inactivated Poliovirus				IPV	IPV	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>											MPSV4			

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2006, for children aged 0–6 years. Additional information is available at <http://www.cdc.gov/nip/recs/child-schedule.htm>. 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. 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 can only be delayed with physician's order and mothers' 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 at age ≥24 weeks. Infants born to HBsAg-positive mothers should be tested for HBsAg and antibody to HBsAg after completion of ≥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® or ComVax® [Merck]) is administered at ages 2 and 4 months, a dose at age 6 months is not required.
- TriHibit® (DTaP/Hib) combination products should not be used for primary immunization but can be used as boosters following 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 PCV at ages 24–59 months in certain high-risk groups. Administer PPV to children aged ≥2 years in certain high-risk groups. See *MMWR* 2000;49(No. RR-9):1–35.

#### 6. Influenza vaccine. (Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 5 years for live, attenuated influenza vaccine [LAIV])

- All children aged 6–59 months and close contacts of all children aged 0–59 months are recommended to receive influenza vaccine.
- Influenza vaccine is recommended annually for children aged ≥59 months with certain risk factors, health-care workers, and other persons (including household members) in close contact with persons in groups at high risk. See *MMWR* 2006;55(No. RR-10):1–41.
- For healthy persons aged 5–49 years, LAIV may be used as an alternative to TIV.
- Children receiving TIV should receive 0.25 mL if aged 6–35 months or 0.5 mL if aged ≥3 years.
- Children aged <9 years who are receiving influenza vaccine for the first time should receive 2 doses (separated by ≥4 weeks for TIV and ≥6 weeks for LAIV).

#### 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 and both doses are administered at age ≥12 months.

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

- Administer the second dose of varicella vaccine at age 4–6 years. Varicella vaccine may be administered before age 4–6 years, provided that ≥3 months have elapsed since the first dose and both doses are administered at age ≥12 months. If second dose was administered ≥28 days following the first dose, the second dose does not need to be repeated.

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

- HepA is recommended for all children aged 1 year (i.e., aged 12–23 months). The 2 doses in the series should be administered 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. See *MMWR* 2006;55(No. RR-7):1–23.

#### 10. Meningococcal polysaccharide vaccine (MPSV4). (Minimum age: 2 years)

- Administer MPSV4 to children aged 2–10 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high-risk groups. See *MMWR* 2005;54(No. RR-7):1–21.

FIGURE 2. Recommended immunization schedule for persons aged 7–18 years — United States, 2007

Vaccine ▼	Age ►	7–10 years	11–12 YEARS	13–14 years	15 years	16–18 years	
Tetanus, Diphtheria, Pertussis <sup>1</sup>	See footnote 1		<b>Tdap</b>			Tdap	Range of recommended ages
Human Papillomavirus <sup>2</sup>	See footnote 2		<b>HPV (3 doses)</b>			HPV Series	
Meningococcal <sup>3</sup>		MPSV4	<b>MCV4</b>			MCV4 <sup>3</sup> MCV4	
Pneumococcal <sup>4</sup>			<b>PPV</b>				Catch-up immunization
Influenza <sup>5</sup>			<b>Influenza (Yearly)</b>				
Hepatitis A <sup>6</sup>			<b>HepA Series</b>				Certain high-risk groups
Hepatitis B <sup>7</sup>			<b>HepB Series</b>				
Inactivated Poliovirus <sup>8</sup>			<b>IPV Series</b>				
Measles, Mumps, Rubella <sup>9</sup>			<b>MMR Series</b>				
Varicella <sup>10</sup>			<b>Varicella Series</b>				

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2006, for children aged 7–18 years. Additional information is available at <http://www.cdc.gov/nip/recs/child-schedule.htm>. 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. 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/DTaP 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 Td/Tdap booster dose should also receive a single dose of Tdap if they have completed the recommended childhood DTP/DTaP vaccination series.

**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.** (Minimum age: 11 years for meningococcal conjugate vaccine [MCV4]; 2 years for meningococcal polysaccharide vaccine [MPSV4])

- Administer MCV4 at age 11–12 years and to previously unvaccinated adolescents at high school entry (at approximately age 15 years).
- Administer MCV4 to previously unvaccinated college freshmen living in dormitories; MPSV4 is an acceptable alternative.
- Vaccination against invasive meningococcal disease is recommended for children and adolescents aged ≥2 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high-risk groups. See *MMWR* 2005;54(No. RR-7):1–21. Use MPSV4 for children aged 2–10 years and MCV4 or MPSV4 for older children.

**4. Pneumococcal polysaccharide vaccine (PPV).** (Minimum age: 2 years)

- Administer for certain high-risk groups. See *MMWR* 1997;46(No. RR-8):1–24, and *MMWR* 2000;49(No. RR-9):1–35.

**5. Influenza vaccine.** (Minimum age: 6 months for trivalent inactivated influenza vaccine [TIV]; 5 years for live, attenuated influenza vaccine [LAIV])

- Influenza vaccine is recommended annually for persons with certain risk factors, health-care workers, and other persons (including household members) in close contact with persons in groups at high risk. See *MMWR* 2006;55(No. RR-10):1–41.
- For healthy persons aged 5–49 years, LAIV may be used as an alternative to TIV.
- Children aged <9 years who are receiving influenza vaccine for the first time should receive 2 doses (separated by ≥4 weeks for TIV and ≥6 weeks for LAIV).

**6. Hepatitis A vaccine (HepA).** (Minimum age: 12 months)

- The 2 doses in the series should be administered at least 6 months apart.
- HepA is recommended for certain other groups of children, including in areas where vaccination programs target older children. See *MMWR* 2006;55(No. RR-7):1–23.

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

- 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).** (Minimum age: 6 weeks)

- 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 ≥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).** (Minimum age: 12 months)

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

**10. Varicella vaccine.** (Minimum age: 12 months)

- Administer 2 doses of varicella vaccine to persons without evidence of immunity.
- Administer 2 doses of varicella vaccine to persons aged ≤13 years at least 3 months apart. Do not repeat the second dose, if administered ≥28 days after the first dose.
- Administer 2 doses of varicella vaccine to persons aged ≥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, 2007**

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>3</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 and current age <24 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	8 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).** (Minimum age: birth)

- 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).** (Minimum age: 6 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 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).** (Minimum age: 6 weeks)

- 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).** (Minimum age: 6 weeks)

- Vaccine is not generally recommended for children aged  $\geq 5$  years.

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

- 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.

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

- 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.** (Minimum age: 12 months)

- 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).** (Minimum age: 12 months)

- HepA is recommended for certain groups of children, including in areas where vaccination programs target older children. See MMWR 2006;55(No. RR-7):1–23.

**10. Tetanus and diphtheria toxoids vaccine (Td) and tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap).** (Minimum ages: 7 years for Td, 10 years for BOOSTRIX<sup>®</sup>, and 11 years for ADACEL<sup>™</sup>)

- 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. Refer to ACIP recommendations for further information. See MMWR 2006;55(No. RR-3).

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

- 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/nip/default.htm> or telephone, 800-CDC-INFO (800-232-4636).