

# Recommended Childhood and Adolescent Immunization Schedule — United States, 2006

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## Harmonized Childhood and Adolescent Immunization Schedule, 2006

The Advisory Committee on Immunization Practices (ACIP) periodically reviews the recommended childhood and adolescent immunization schedule 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 recommendations and format of the childhood and adolescent immunization schedule and catch-up schedule for January–December 2006 were approved by ACIP, the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP) (Figure and Table).

The changes to the previous childhood and adolescent immunization schedule, published January 2005 (1), are as follows:

- The importance of the hepatitis B vaccine (HepB) birth dose has been emphasized. Vaccination of infants born to hepatitis B surface antigen (HBsAg)-negative mothers can be delayed in rare circumstances, but only if a physician's order to withhold the vaccine and a copy of the mother's original HBsAg-negative laboratory report are documented in the infant's medical record. Administering four doses of HepB is permissible (e.g., when combination vaccines are administered after the birth dose); however, if monovalent HepB is used, a dose at age 4 months is not needed. For infants born to HBsAg-positive mothers, testing for HBsAg and antibody to HBsAg after completion of the vaccine series should be conducted at age 9–18 months (generally at the next well-child visit after completion of the vaccine series).
- A new tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine recommended by ACIP for adolescents (Tdap adolescent preparation) was approved by the

Food and Drug Administration (FDA) on May 5, 2005, for use in the United States. Tdap is recommended for adolescents aged 11–12 years who have completed the recommended childhood diphtheria and tetanus toxoids and pertussis/diphtheria and tetanus toxoids and acellular pertussis (DTP/DTaP) vaccination series and have not received a tetanus and diphtheria toxoids (Td) booster dose. Adolescents aged 13–18 years who missed the age 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. Subsequent Td boosters are recommended every 10 years (2).

- Meningococcal conjugate vaccine (MCV4), approved by FDA on January 14, 2005, should be administered to all children at age 11–12 years as well as to unvaccinated adolescents at high school entry (age 15 years). Other adolescents who wish to decrease their risk for meningococcal disease may also be vaccinated. All college freshmen living in dormitories should also be vaccinated with MCV4 or meningococcal polysaccharide vaccine (MPSV4). For prevention of invasive meningococcal disease, vaccination with MPSV4 for children aged 2–10 years and with MCV4 for older children in certain high-risk groups is recommended (3).
- Influenza vaccine is now recommended for children aged  $\geq 6$  months with certain risk factors, which now specifically include conditions that can compromise respiratory function or handling of respiratory secretions or that can increase the risk for aspiration (4).
- Hepatitis A vaccine is now universally recommended for all children at age 1 year (12–23 months). The 2 doses in the series should be administered at least 6 months apart.
- The catch-up schedule for persons aged 7–18 years has been changed for Td; Tdap may be substituted for any dose in a primary catch-up series or as a booster if age appropriate for Tdap. A 5-year interval from the last Td dose is encouraged when Tdap is used as a booster dose.

The Recommended Childhood and Adolescent Immunization Schedule and the Catch-up Childhood and Adolescent Immunization Schedule 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 childhood and adolescent immunization schedule—United States, 2006. *MMWR* 2005;54 (Nos. 51&52):Q1–Q4.

## Vaccine Information Statements

The National Childhood Vaccine Injury Act requires that health-care providers provide parents or patients with copies

FIGURE. Recommended childhood and adolescent immunization schedule, by vaccine and age — United States, 2006

Vaccine ▼	Age ▶	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	24 months	4–6 years	11–12 years	13–14 years	15 years	16–18 years
Hepatitis B <sup>1</sup>	HepB		HepB	HepB <sup>1</sup>		HepB						HepB Series			
Diphtheria, Tetanus, Pertussis <sup>2</sup>			DTaP	DTaP	DTaP			DTaP			DTaP	Tdap	Tdap		
Haemophilus influenzae type b <sup>3</sup>			Hib	Hib	Hib <sup>3</sup>		Hib								
Inactivated Poliovirus			IPV	IPV		IPV					IPV				
Measles, Mumps, Rubella <sup>4</sup>							MMR				MMR		MMR		
Varicella <sup>5</sup>							Varicella					Varicella			
Meningococcal <sup>6</sup>												MCV4		MCV4	
Pneumococcal <sup>7</sup>			PCV	PCV	PCV		PCV				PCV		PPV		
Influenza <sup>8</sup>							Influenza (yearly)					Influenza (yearly)			
Hepatitis A <sup>9</sup>							HepA series					HepA series			

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2005, for children through age 18 years. Any dose not administered at the recommended age should be administered at any subsequent visit, when indicated and feasible.   Indicates age groups that warrant special effort to administer those vaccines not previously administered. Additional vaccines might 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 respective Advisory Committee on Immunization Practices (ACIP) statements for detailed recommendations. Clinically significant adverse events that follow vaccination should be reported through 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.

  Range of recommended ages        Catch-up immunization        Assessment at age 11–12 years

- Hepatitis B vaccine (HepB).** *AT BIRTH:* All newborns should receive monovalent HepB soon after birth and before hospital discharge. **Infants born to mothers who are hepatitis B surface antigen (HBsAg)-positive** should receive HepB and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth. **Infants born to mothers whose HBsAg status is unknown** should receive HepB within 12 hours of birth. The mother should have blood drawn as soon as possible to determine her HBsAg status; if HBsAg-positive, the infant should receive HBIG as soon as possible (no later than age 1 week). **For infants born to HBsAg-negative mothers,** the birth dose can be delayed in rare circumstances but only if a physician's order to withhold the vaccine and a copy of the mother's original HBsAg-negative laboratory report are documented in the infant's medical record. *FOLLOWING 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. Administering four doses of HepB is permissible (e.g., when combination vaccines are administered after the birth dose); however, if monovalent HepB is used, a dose at age 4 months is not needed. **Infants born to HBsAg-positive mothers** should be tested for HBsAg and antibody to HBsAg after completion of the HepB series at age 9–18 months (generally at the next well-child visit after completion of the vaccine series).
- Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP).** The fourth dose of DTaP may be administered as early as age 12 months, provided 6 months have elapsed since the third dose and the child is unlikely to return at age 15–18 months. The final dose in the series should be administered at age ≥4 years. **Tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap adolescent preparation)** is recommended 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 (Td) booster dose. Adolescents aged 13–18 years who missed the age 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. **Subsequent Td boosters** are recommended every 10 years.
- Haemophilus influenzae type b conjugate vaccine (Hib).** Three Hib conjugate vaccines are licensed for infant use. If PRP-OMP (PedvaxHIB® or ComVax® [Merck]) is administered at ages 2 and 4 months, a dose at age 6 months is not required. DTaP/Hib combination products should not be used for primary immunization in infants at ages 2, 4, or 6 months but may be used as boosters after any Hib vaccine. The final dose in the series should be administered at age ≥12 months.
- Measles, mumps, and rubella vaccine (MMR).** The second dose of MMR is recommended routinely at age 4–6 years but may be administered during any visit, provided at least 4 weeks have elapsed since the first dose and both doses are administered at or after age 12 months. Children who have not previously received the second dose should complete the schedule by age 11–12 years.
- Varicella vaccine.** Varicella vaccine is recommended at any visit at or after age 12 months for susceptible children (i.e., those who lack a reliable history of varicella). Susceptible persons aged ≥13 years should receive 2 doses administered at least 4 weeks apart.
- Meningococcal vaccine (MCV4).** Meningococcal conjugate vaccine (MCV4) should be administered to all children at age 11–12 years as well as to unvaccinated adolescents at high school entry (age 15 years). Other adolescents who wish to decrease their risk for meningococcal disease may also be vaccinated. All college freshmen living in dormitories should also be vaccinated, preferably with MCV4, although **meningococcal polysaccharide vaccine (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 for certain other high risk groups (see *MMWR* 2005;54[No. RR-7]); use MPSV4 for children aged 2–10 years and MCV4 for older children, although MPSV4 is an acceptable alternative.
- Pneumococcal vaccine.** The heptavalent **pneumococcal conjugate vaccine (PCV)** is recommended for all children aged 2–23 months and for certain children aged 24–59 months. The final dose in the series should be administered at age ≥12 months. **Pneumococcal polysaccharide vaccine (PPV)** is recommended in addition to PCV for certain high-risk groups. See *MMWR* 2000;49(No. RR-9).
- Influenza vaccine.** Influenza vaccine is recommended annually for children aged ≥6 months with certain risk factors (including, but not limited to, asthma, cardiac disease, sickle cell disease, human immunodeficiency virus infection, diabetes, and conditions that can compromise respiratory function or handling of respiratory secretions or that can increase the risk for aspiration), health-care workers, and other persons (including household members) in close contact with persons in groups at high risk (see *MMWR* 2005;54[No. RR-8]). In addition, healthy children aged 6–23 months and close contacts of healthy children aged 0–5 months are recommended to receive influenza vaccine because children in this age group are at substantially increased risk for influenza-related hospitalizations. For healthy, nonpregnant persons aged 5–49 years, the intranasally administered, live, attenuated influenza vaccine (LAIV) is an acceptable alternative to the intramuscular trivalent inactivated influenza vaccine (TIV). See *MMWR* 2005;54(No. RR-8). Children receiving TIV should be administered an age-appropriate dosage (0.25 mL for children aged 6–35 months or 0.5 mL for children aged ≥3 years). Children aged ≤8 years who are receiving influenza vaccine for the first time should receive 2 doses (separated by at least 4 weeks for TIV and at least 6 weeks for LAIV).
- Hepatitis A vaccine (HepA).** HepA is recommended for all children at age 1 year (i.e., 12–23 months). The 2 doses in the series should be administered at least 6 months apart. States, counties, and communities with existing HepA vaccination programs for children aged 2–18 years are encouraged to maintain these programs. In these areas, new efforts focused on routine vaccination of children aged 1 year should enhance, not replace, ongoing programs directed at a broader population of children. HepA is also recommended for certain high risk groups (see *MMWR* 1999;48[No. RR-12]).

**TABLE. Catch-up immunization schedule for children and adolescents who start late or who are  $\geq 1$  month behind, by age group, vaccine, and dosage interval — United States, 2006**

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 chart appropriate for the child's age.

CATCH-UP SCHEDULE FOR CHILDREN 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
Diphtheria, Tetanus, Pertussis	6 weeks	4 weeks	4 weeks	6 months	6 months <sup>1</sup>
Inactivated Poliovirus	6 weeks	4 weeks	4 weeks	4 weeks <sup>2</sup>	
Hepatitis B <sup>3</sup>	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Measles, Mumps, Rubella	12 months	4 weeks <sup>4</sup>			
Varicella	12 months				
<i>Haemophilus influenzae</i> type b <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 12–14 months No further doses needed if first dose administered at age $\geq 15$ months	4 weeks <sup>6</sup> if current age <12 months 8 weeks (as final dose) <sup>6</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>7</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	
CATCH-UP SCHEDULE FOR CHILDREN AGED 7–18 YEARS					
Vaccine	Minimum interval between doses				
	Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Booster Dose		
Tetanus, Diphtheria <sup>8</sup>	4 weeks	6 months	6 months if first dose administered at age <12 months and current age <11 years; otherwise 5 years		
Inactivated Poliovirus <sup>9</sup>	4 weeks	4 weeks	IPV <sup>2,9</sup>		
Hepatitis B	4 weeks	8 weeks (and 16 weeks after first dose)			
Measles, Mumps, Rubella	4 weeks				
Varicella <sup>10</sup>	4 weeks				

- DTaP.** The fifth dose is not necessary if the fourth dose was administered after the fourth birthday.
- 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.
- HepB.** Administer the 3-dose series to all persons aged <19 years if they were not previously vaccinated.
- MMR.** The second dose of MMR is recommended routinely at age 4–6 years but may be administered earlier if desired.
- Hib.** Vaccine is not generally recommended for children aged  $\geq 5$  years.

- Hib.** If current age is <12 months and the first 2 doses were PRP-OMP (PedvaxHIB® or ComVax® [Merck]), the third (and final) dose should be administered at age 12–15 months and at least 8 weeks after the second dose.
- PCV.** Vaccine is not generally recommended for children aged  $\geq 5$  years.
- Td.** Tdap adolescent preparation may be substituted for any dose in a primary catch-up series or as a booster if age appropriate for Tdap. A 5-year interval from the last Td dose is encouraged when Tdap is used as a booster dose. See ACIP recommendations for additional information.
- IPV.** Vaccine is not generally recommended for persons aged  $\geq 18$  years.
- Varicella.** Administer the 2-dose series to all susceptible adolescents aged  $\geq 13$  years.

Adverse reactions to vaccines should be reported through VAERS. Information on reporting reactions after vaccination is available at <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 about vaccines, including precautions and contraindications for vaccination and vaccine shortages, is available in English and Spanish from the National Immunization Program at <http://www.cdc.gov/nip> or by telephone, 800-CDC-INFO (800-232-4636).

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 (5)*. ACIP statements for each recommended childhood vaccine are available at the CDC National Immunization Program website 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

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5. 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.