

AN EPIDEMIOLOGY PUBLICATION OF THE OREGON DEPARTMENT OF HUMAN SERVICES

THE 2009 CHILD AND ADOLESCENT IMMUNIZATION SCHEDULES

Table 1

Recommended Immunization Schedule for Persons Aged 0 Through 6 Years  
United States, 2009

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						Range of recommended ages
Rotavirus <sup>2</sup>				RV	RV	RV <sup>2</sup>							
Diphtheria, Tetanus, Pertussis <sup>3</sup>				DTaP	DTaP	DTaP	see footnote 3	DTaP				DTaP	
<i>Haemophilus influenzae</i> type b <sup>4</sup>				Hib	Hib	Hib <sup>4</sup>		Hib					Certain high-risk groups
Pneumococcal <sup>5</sup>				PCV	PCV	PCV		PCV				PPSV	
Inactivated Poliovirus				IPV	IPV			IPV				IPV	
Influenza <sup>6</sup>								Influenza (Yearly)					
Measles, Mumps, Rubella <sup>7</sup>								MMR		see footnote 7		MMR	
Varicella <sup>8</sup>								Varicella		see footnote 8		Varicella	
Hepatitis A <sup>9</sup>								HepA (2 doses)				HepA Series	
Meningococcal <sup>10</sup>												MCV	

Table 2

Recommended Immunization Schedule for Persons Aged 7 Through 18 Years  
United States, 2009

Vaccine ▼	Age ►	7-10 years	11-12 years	13-18 years	
Tetanus, Diphtheria, 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>		MCV	MCV	MCV	Catch-up immunization
Influenza <sup>4</sup>			Influenza (Yearly)		
Pneumococcal <sup>5</sup>			PPSV		
Hepatitis A <sup>6</sup>			HepA Series		Certain high-risk groups
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		

## HIGHLIGHTS OF THIS YEAR'S SCHEDULES

The recently published immunization schedules for children and adolescents in the United States has been endorsed by the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics, and the American Academy of Family Physicians. Changes to the 2008 schedules are as follows.<sup>1</sup>

### TWO ROTAVIRUS VACCINES INVITE A BLENDED SCHEDULE

Since Rotateq® is a 3-dose series and Rotarix® is only 2 doses, a new blended schedule recommends that the maximum age for the first dose be 14 weeks 6 days and the maximum age for a final dose be 8 months 0 days. These two vaccines are interchangeable with the proviso that if Rotateq® is given as any part of the series, then the series needs to be 3 doses. If Rotarix® is administered at ages 2 and 4 months, then a dose at 6 months is not indicated and the series is complete.

### YEARLY INFLUENZA VACCINATION NOW ROUTINE

Beginning with the 2008–2009 influenza season, annual influenza vaccination is recommended for all children 6 months through 18 years of age. Remember that children <9 years of age 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. Healthy, non-pregnant persons 2–49 years may receive either live attenuated influenza vaccine or inactivated vaccine.<sup>2</sup>

### PERTUSSIS IMMUNITY FOR TEENS

Although 5 years is encouraged as the minimum interval between the last Td and a Tdap booster for adolescents 10 through 18 years of age, a shorter interval may be used if pertussis immunity is needed. Pertussis immunity may be beneficial if an individual cares for or resides in the home of children <1 year of age, or is exposed to a pertussis outbreak.

### HPV CATCH-UP VACCINATION

Routine dosing intervals should be used for series catch-up (i.e., the second and third doses should be administered 2 and 6 months after the first dose). While the minimum spacing between dose #1 and #2 is 4 weeks, and the minimum spacing between dose #2 and #3 is 12 weeks, the third and final dose should be given at least 24 weeks after the first dose (see Table 2).

### HIB VACCINE IN SHORT SUPPLY

Since Merck has suspended production of its Pedvax® and Comvax® Hib conjugate vaccines and does not expect to resume distribution of these vaccines until June 2009 at the earliest, and because this has caused a reduction in available doses of Hib-containing vaccines, CDC and the Oregon Public Health Division Immunization Program recommend the following:

- Defer administration of the booster dose of Hib vaccine that is usually administered at 12–15 months of age.
- Defer administration of Hib vaccine to high-risk adults. Children under 5 years of age constitute the highest-risk group for invasive Hib disease.

- Continue to administer the complete primary series of vaccine (2 or 3 doses, depending on the formulation) beginning at age 2 months.

- Continue to administer the 12–15 month booster dose *only* to children from one of these high-risk conditions: asplenia, sickle cell disease, human immunodeficiency virus infection (HIV) or certain other immunodeficiency syndromes and malignant neoplasms; and American Indian and Alaska Natives (If available, use PedvaxHIB® or Comvax® in this population, particularly in the first six months of life, as they lead to more rapid seroconversion).

- If Pentacel2 (DTap-Hib-IPV) is the only Hib-containing vaccine available, use it to complete the primary series, even if it results in receipt of redundant doses of other antigens.<sup>3</sup>

This link to the Oregon DHS Immunization Program will allow you to download a Hib vaccine shortage deferral table of children 2–59 months of age who do not fall into high-risk categories for Hib disease: <http://oregon.gov/DHS/ph/imm/docs/Hib-VacDeferTbl.pdf>.

### REFERENCES

1. CDC. Recommended Immunization Schedules for persons aged 0 through 18 years – United States, 2009. *MMWR* 2009;57: Nos. 51 & 52. Available at [www.cdc.gov/mmwr/preview/mmwrhtml/mm5715a51.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5715a51.htm).
2. CDC. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP) *MMWR* 2008;57 [RR-7].
3. CDC. Hib vaccine shortage provider letter 10 Feb 2009. Available at [www.cdc.gov/vaccines/vac-gen/shortages/downloads/hcp-hib-notice-feb09-508.pdf](http://www.cdc.gov/vaccines/vac-gen/shortages/downloads/hcp-hib-notice-feb09-508.pdf)

### Footnotes to Table 1 (verso)

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

##### At birth:

- Administer monovalent HepB to all newborns before hospital discharge.
- If mother is hepatitis B 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).

##### 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 or 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 (anti-HBs) after completion of at least 3 doses of the HepB series, at age 9–18 months (generally at the next well-child visit).

##### 4-month dose:

- Administration of 4 doses of HepB to infants is permissible when combination vaccines containing HepB are administered after the birth dose.

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

- Administer the first dose at age 6–14 weeks (maximum age: 14 weeks 6 days). Vaccination should not be initiated for infants aged 15 weeks or older (15 weeks 0 days or older).
- Administer the final dose in the series by age 8 months 0 days.
- If Rotarix® is administered at ages 2 and 4 months, a dose at 6 months is not indicated.

#### 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 at least 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® [HepB-Hib]) is administered at ages 2 and 4 months, a dose at age 6 months is not indicated.
- TriHiBit® (DTaP/Hib) combination products should not be used for doses at ages 2, 4, or 6 months, but can be used as the final dose in children aged 12 months or older.

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

- PCV is recommended for all children aged younger than 5 years. Administer one dose of PCV to all healthy children aged 24–59 months who are not completely vaccinated for their age.
- Administer PPSV to children aged 2 years or older with certain underlying medical conditions (see *MMWR* 2000;49 [RR-9]), including a cochlear implant.

#### 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 months through 18 years.
- 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.
- Children receiving TIV should receive 0.25mL if aged 6–35 months or 0.5 mL if aged 3 years or older.
- Administer 2 doses (separated by at least 4 weeks) to children aged younger than 9 years who are receiving influenza vaccine for the first time or who were vaccinated for the first time during the previous influenza season but only received one dose.

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

- Administer the second dose at age 4–6 years. However, the second dose may be administered before age 4, provided at least 28 days have elapsed since the first dose.

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

- Administer the second dose at age 4–6 years. However, the second dose may be administered before age 4, provided at least 3 months have elapsed since the first dose.
- For children aged 12 months through 12 years, the minimum interval between doses is 3 months. However, if the second dose was administered at least 28 days after the first dose, it can be accepted as valid.

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

- Administer to all children aged 1 year (i.e. aged 12–23 months). Administer 2 doses at least 6 months apart.
- Children not fully vaccinated by age 2 years can be vaccinated at subsequent visits.
- HepA is recommended for children older than 1 year who live in areas where vaccination programs target older children or who are at increased risk of infection. See *MMWR* 2006;55: [RR-7].

**10. Meningococcal vaccine.** (Minimum age: 2 years for meningococcal conjugate (MCV) and for meningococcal polysaccharide vaccine (MPSV))

- Administer MCV to children aged 2–10 years with terminal complement component deficiency, anatomic or functional asplenia, and certain other high-risk groups. See *MMWR* 2005;54 [RR-7].
- Persons who received MPSV 3 or more years previously and who remain at increased risk for meningococcal disease should be revaccinated with MCV.

**Footnotes to Table 2 (page 1)**

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

- Administer at age 11 or 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
- Persons aged 13–18 years who have not received Tdap should receive a dose.
- A 5-year interval from the last Td dose is encouraged when Tdap is used as a booster dose; however, a shorter interval may be used if pertussis immunity is needed.

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

- Administer the first dose to females at age 11 or 12 years.
- Administer the second dose 2 months after the first dose and the third dose 6 months after the first dose (at least 24 weeks after the first dose).
- Administer the series to females at age 13–18 years if not previously vaccinated.

**3. Meningococcal vaccine (MCV).**

- Administer at age 11–12 years, or at age 13–18 if not previously vaccinated.
- Administer to previously unvaccinated college freshmen living in a dormitory.
- MCV is recommended for children aged 2–10 years with terminal complement component deficiency, anatomic or functional asplenia and certain other groups at high risk. (See *MMWR* 2005;54: [RR-7].)
- Persons who received MPSV 5 or more years previously and remain at risk for meningococcal disease should be re-vaccinated with MCV.

**4. Influenza vaccine.**

- Administer annually to children aged 6 months through 18 years.
- For healthy, non-pregnant 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..

- Administer 2 doses (separated by at least 4 weeks) to children younger than 9 years of age who are receiving influenza vaccine for the first time or who were vaccinated for the first time during the previous influenza season, but only received 1 dose.

**5. Pneumococcal polysaccharide vaccine (PPSV).**

- Administer to children with certain underlying medical conditions (see *MMWR* 1997;46:[RR-8]), including a cochlear implant. A single revaccination should be administered to children with functional or anatomic asplenia or other immunocompromising condition after 5 years.

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

- Administer 2 doses at least 6 months apart.
- HepA is recommended for children older than 1 year of age who live in areas where vaccination programs target older children or who are at increased risk of infection. (See *MMWR* 2006;55: [RR-7]).

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

- Administer the 3-dose series to those not previously vaccinated.
- A 2-dose series (separated by at least 4 months) of adult formulation Recombivax HB® 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 4 years or older.
- 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 or the second dose for those who have received only 1 dose, with at least 28 days between doses.

**10. Varicella vaccine.**

- For persons aged 7–18 years without evidence of immunity (see *MMWR* 2007;56 [RR-4]), administer 2 doses if not previously vaccinated or the second dose if they received only 1 dose.
- For persons aged 7–12 years, the minimum interval between doses is 3 months. However, if the second dose was administered at least 28 days after the first dose, it can be accepted as valid.
- For persons aged 13 years and older, the minimum interval between doses is 28 days.

**Footnotes to Table 3 (verso)**

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

- Administer the 3-dose series to those not previously vaccinated.
- A 2-dose series (separated by at least 4 months) of adult formulation Recombivax HB® is licensed for children aged 11–15 years.

**2. Rotavirus vaccine (RV).**

- The maximum age for the first dose is 14 weeks 6 days. Vaccination should not be initiated for infants aged 15 weeks or older (i.e. 15 weeks 0 days or older).
- Administer the final dose in the series by age 8 months 0 days.
- If Rotarix® was administered for the first and second doses, a third dose is not indicated.

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

- The fifth dose is not necessary if the fourth dose was administered at age 4 years or older.

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

- Hib vaccine is not generally recommended for persons aged 5 years or older. No efficacy data are available on which to base a recommendation concerning use of Hib vaccine for older children and adults. However, studies suggest good immunogenicity in persons with sickle cell disease, leukemia, or HIV infection, or who have had a splenectomy; administering 1 dose of Hib vaccine to these persons is not contraindicated.
- If the first 2 doses were PRP-OMP (PedvaxHIB® or ComVax®), and administered at age 11 months or

younger, 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 and a final dose at age 12–15 months.

**5. Pneumococcal vaccine.**

- Administer one dose of pneumococcal conjugate vaccine (PCV) to all healthy children aged 24–59 months who have not received at least 1 dose of PCV on or after age 12 months.
- For children aged 24–59 months with underlying medical conditions, administer 1 dose of PCV if 3 doses were received previously or administer 2 doses of PCV at least 8 weeks apart if fewer than 3 doses were received previously.
- Administer pneumococcal polysaccharide vaccine (PPSV) to children aged 2 years or older with certain underlying medical conditions (see *MMWR* 2000;49 [RR-9]), including a cochlear implant, at least 8 weeks after the last dose of PCV.

**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 4 years or older.
- 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).**

- Administer the second dose at age 4–6 years. However, the second dose may be administered before age 4, provided at least 28 days have elapsed since the first dose.
- If not previously vaccinated, administer 2 doses with at least 28 days between doses.

**8. Varicella vaccine.**

- Administer the second dose at age 4–6 years. However the second dose may be administered before age 4, provided at least 28 days have elapsed since the first dose.
- For persons aged 12 months through 12 years, the minimum interval between doses is 3 months. However, if the second dose was administered at least 28 days after the first dose, it can be accepted as valid.
- For persons aged 13 years or older, the minimum interval between doses is 28 days.

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

- HepA is recommended for children older than 1 year who live in areas where vaccination programs target older children or who are at increased risk of infection. (See *MMWR* 2006;55 [RR-7].)

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

- Doses of DTaP are counted as part of the Td/Tdap series.
- Tdap should be substituted for a single dose of Td in the catch-up series or as a booster for children aged 10–18 years; use Td for other doses.

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

- Administer the series to females at age 13–18 years if not previously vaccinated.
- Use recommended routine dosing intervals for series catch-up (i.e., the second and third doses should be administered at 2 and 6 months after the first dose). However, the minimum interval between the first and second doses is 4 weeks. The minimum interval between the second and third doses is 12 weeks, and the third dose should be given at least 24 weeks after the first dose.

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**Table 3 Catch-up Immunization Schedule, 4 months Through 18 Years**  
 starting late or more than one month behind—United States, 2009

CATCH-UP SCHEDULE FOR PERSONS AGED 4 MONTHS–6 YEARS					
Vaccine	Min. 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 wks	4 weeks	4 weeks <sup>2</sup>		
Diphtheria, Tetanus, Pertussis <sup>3</sup>	6 wks	4 weeks	4 weeks	6 months	6 months <sup>3</sup>
<i>Haemophilus influenzae</i> type b <sup>4</sup>	6 wks	4 weeks if first dose administered at younger than 12 months of age. 8 weeks (as final dose) if first dose administered at 12–14 months. No further doses needed if first dose administered at 15 months of age or older.	4 weeks <sup>4</sup> if current age <12 months of age. 8 weeks (as final dose) <sup>4</sup> if current age 12 months or older and second dose administered at <15 months of age. 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 months–59 months who received 3 doses before age 12 months.	
Pneumococcal <sup>5</sup>	6 wks	4 weeks if first dose administered at <12 months of age. 8 weeks (as final dose for healthy children) if first dose administered at age 12 months or older or current age 24–59 months. No further doses needed for healthy children if first dose administered at age 24 months or older.	4 weeks if current age <12 months of age 8 weeks (as final dose for healthy children) if current age 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 months–59 months who received 3 doses before age 12 months or high risk children who received 3 doses at any age.	
Inactivated Poliovirus <sup>6</sup>	6 wks	4 weeks	4 weeks	4 weeks <sup>6</sup>	
Measles, Mumps, Rubella <sup>7</sup>	12 mos	4 weeks			
Varicella <sup>8</sup>	12 mos	3 months			
Hepatitis A <sup>9</sup>	12 mos	6 months			
CATCH-UP SCHEDULE FOR PERSONS AGED 7–18 YEARS					
Tetanus, Diphtheria/ Tetanus, Diphtheria, Pertussis <sup>10</sup>	7 yrs <sup>10</sup>	4 weeks	4 weeks if first dose administered at <12 months of age. 6 months if first dose administered at 12 months or older.	6 months if first dose administered at <12 months of age.	
Human Papillomavirus <sup>11</sup>	9 yrs	Routine dosing intervals are recommended			
Hepatitis A <sup>9</sup>	12 mos	6 months			
Hepatitis B <sup>1</sup>	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Inactivated Poliovirus <sup>6</sup>	6 wks	4 weeks	4 weeks	4 weeks <sup>6</sup>	
Measles, Mumps, Rubella <sup>7</sup>	12 mos	4 weeks			
Varicella <sup>8</sup>	12 mos	3 months if first dose administered at <13 years of age 4 weeks if person is aged 13 years or older.			