

AN EPIDEMIOLOGY PUBLICATION OF THE OREGON DEPARTMENT OF HUMAN SERVICES

THE 2008 CHILD AND ADOLESCENT IMMUNIZATION SCHEDULE

The 2008 immunization schedule 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 from the 2007 schedule are as follows.

**FLUMIST® APPROVED DOWN TO AGE TWO**

The FDA approved live, attenuated influenza vaccine (LAIV) for healthy children down to 2 years of age.<sup>1</sup> Some prefer LAIV for eligible children 2–4 years of age, because in a randomized double-blind clinical trial it was more effective than inactivated vaccine in preventing culture-positive influenza A illness.<sup>2</sup> However, this live virus nasal spray should not be given to children <5 years old who have had recurrent wheezing.<sup>1</sup> 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.<sup>3</sup>

**MENACTRA® APPROVED DOWN TO AGE TWO**

The quadrivalent meningococcal conjugate vaccine (MCV4, Menactra®) is the meningococcal vaccine of choice for children ≥2 years of age who are at increased risk for meningococcal disease, including children who

- travel to or are residents of countries in which the disease is hyperendemic or epidemic,
- have terminal complement component deficiencies, or
- have anatomic or functional asplenia.<sup>4</sup>

However, meningococcal polysaccharide vaccine (MPSV4) is an acceptable alternative for short-term (i.e., 3–5 years) protection against meningococcal disease for persons 2–18 years of age.<sup>5</sup>

**Td AND Tdap CATCH-UP SCHEDULE**

Persons 7–18 years of age who received any previous doses of DTaP at <12 months of age will need 3 additional doses of a tetanus- and diphtheria-containing vaccine to complete their series.

The 2nd and 3rd doses should be separated by ≥4 weeks, while the 3rd and 4th doses should be separated by ≥6 months.

If the first dose of a diphtheria- and tetanus-containing vaccine is received at >12 months of age, 2 more doses will complete the series. The 3rd dose should be administered ≥6 months after the 2nd dose.

**REFERENCES**

1. 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.
2. Belshe RB, Edwards KM, Vesikari T, et al. Live attenuated versus inactivated influenza vaccine in infants and young children. N Engl J Med 2007;356: 685–6.
3. CDC. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2007;56 RR-6.
4. CDC. Prevention and control of influenza: recommendations of 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.
5. CDC. Revised recommendations of the ACIP to vaccinate all persons aged 11–18 with meningococcal conjugate vaccine. MMWR 2007;56:794–5.

Recommended Immunization Schedule for Persons Aged 0–6 Years United States, 2008

Table 1

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	HepB	HepB	HepB	HepB	HepB	HepB	HepB
Rotavirus <sup>2</sup>			Rota	Rota	Rota	Rota						
Diphtheria, Tetanus, Pertussis <sup>3</sup>			DTaP	DTaP	DTaP	DTaP	see footnote 3	DTaP	DTaP	DTaP	DTaP	DTaP
<i>Haemophilus influenzae</i> type b <sup>4</sup>			Hib	Hib	Hib	Hib <sup>4</sup>	Hib	Hib	Hib	Hib	Hib	Hib
Pneumococcal <sup>5</sup>			PCV	PCV	PCV	PCV	PCV	PCV	PCV	PCV	PPV	PPV
Inactivated Poliovirus			IPV	IPV	IPV	IPV	IPV	IPV	IPV	IPV	IPV	IPV
Influenza <sup>6</sup>							Influenza (Yearly)	Influenza (Yearly)	Influenza (Yearly)	Influenza (Yearly)	Influenza (Yearly)	Influenza (Yearly)
Measles, Mumps, Rubella <sup>7</sup>							MMR	MMR	MMR	MMR	MMR	MMR
Varicella <sup>8</sup>							Varicella	Varicella	Varicella	Varicella	Varicella	Varicella
Hepatitis A <sup>9</sup>							HepA (2 doses)	HepA (2 doses)	HepA (2 doses)	HepA (2 doses)	HepA Series	HepA Series
Meningococcal <sup>10</sup>											MCV4	MCV4

Range of recommended ages

Certain high-risk groups

## Footnotes to Table 1 (verso)

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

#### At birth:

- Administer monovalent HepB to all newborns prior to hospital discharge.
- If mother is hepatitis B surface antigen (HBsAg)-positive, administer HepB and 0.5 mL of hepatitis 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, **in rare cases**, with a 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® or ComVax®) 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 age 12 months or older.

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

- Administer one dose of PCV to all healthy children aged 24–59 months having any incomplete schedule.
- Administer PPV to children aged 2 years and older 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 close contacts of children aged 0–59 months.
- Administer annually to children 5 years of age and older with certain risk factors, to other persons (including household members) in close contact with person in groups at higher risk, and to any child whose parents request vaccination.
- For healthy non-pregnant persons (those who do not have underlying medical conditions that predispose them to influenza complications) ages 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 age 3 years or older.

- Administer 2 doses (separated by 4 weeks or longer) to children younger than 9 years who are receiving influenza vaccine for the first time or who were vaccinated for the first time last season, but only received one 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 or more 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 or more after first dose.
- Don't repeat second dose if administered 28 days or more after first dose.

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

- HepA is recommended for all children aged 1 yr (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.

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

- MPSV4 is recommended for children aged 2–10 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high-risk groups. Use of MPSV4 is also acceptable.
- Persons who received MPSV4 ≥3 years prior and remain at increased risk for meningococcal disease should be vaccinated with MCV4.

## Recommended Immunization Schedule for Persons Aged 7–18 Years United States, 2008

Table 2

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 (3 doses)	
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		

## Footnotes to Table 2 (opposite)

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

- Administer at age 11–12 years for those who have completed the recommended childhood DTP/DaP vaccination series and have not received a tetanus and diphtheria toxoids vaccine (Td) booster dose.
- 13–18 year olds who missed the 11–12 year Tdap or received Td only, are encouraged to receive one dose of Tdap 5 years after the last Td/DaP 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 MCV4 at age 11–12 years and at age 13–18 if not previously vaccinated. 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 high-risk groups.
- Persons who received MPSV4 ≥ 3 years prior and remain at increased risk for meningococcal disease should be vaccinated with MCV4.

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

- Administer PPV to certain high-risk groups.

### 5. Influenza vaccine.

- Administer annually to all close contacts of children aged 0–59 months.
- Administer annually to persons 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 4 weeks or longer) to children younger than 9 years who are receiving influenza vaccine for the first time or who were vaccinated for the first time last season, but only received one dose.
- For healthy nonpregnant persons (those who do not have underlying medical conditions that predispose them to influenza complications) ages 2–49 years, either LAIV or TIV may be used.

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

- 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.

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

- Administer the 3-dose series to those who were not previously vaccinated.
- A 2-dose series of 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 of MMR during any visit, with 4 or more weeks between the doses.

### 10. Varicella vaccine.

- Administer 2 doses of varicella vaccine to persons younger than 13 years of age at least 3 months apart. Do not repeat the second dose, if administered 28 or more days after the first dose.
- Administer 2 doses of varicella vaccine to persons aged 13 years or older at least 4 weeks apart.

Table 3

## Catch-up Immunization Schedule, 4 months–18 Years starting late or more than one month behind—United States, 2008

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		
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 <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–5 years 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) if first dose administered at age 12 months or older or current age 24–59 months. No further doses needed for healthy children if previous dose administered at age 24 months or older.	4 weeks if current age <12 months of age. 8 weeks (as final dose) 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–5 years who received 3 doses before age 12 months.	
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	4 weeks	12 weeks		
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	4 weeks if first dose administered at age 13 years or older. 3 months if first dose administered at <13 years of age.			

See footnotes on page 4

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### Footnotes to Table 3 (verso)

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

- Administer the 3-dose series to those who were not previously vaccinated.
- A 2-dose series of Recombivax HB® 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 4 years or older.
- DTaP is not indicated for persons age 7 years or older.

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

- Vaccine is not generally recommended for children aged 5 years or older.
- If current age is younger than 12 months and the first 2 doses were PRP-OMP (Pedvax-HIB® or ComVax®), 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 one 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 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.
- IPV is not routinely recommended for persons aged 18 years and older.

#### 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 4 or more 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 <13 years of age if administered 28 or more 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):1–23.

#### 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 younger than 12 months of age. Refer to ACIP recommendations for further information. See *MMWR* 2006;55 RR-3).

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

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

The three schedules in this *CD Summary* indicate the recommendation for routine administration of currently licensed childhood vaccines, as of January 1, 2008, for children aged 0–18 years. Additional information is available at [www.cdc.gov/vaccines/recs/schedules/child-schedule.htm](http://www.cdc.gov/vaccines/recs/schedules/child-schedule.htm). Providers should consult the respective Advisory Committee

on Immunization Practices statement for detailed recommendations.

### Hib Shortage: Interim Vaccine Guidelines

These are interim CDC guidelines for the administration of all Hib vaccines during the Pedvax Hib shortage.<sup>1</sup>

- Continue to administer the primary series of vaccine (2 or 3 doses, depending on the formulation) beginning at age 2 months (with minimum interval of 4 weeks between each dose). This series can be completed with ActHIB® if series was started with PedvaxHIB® or Comvax®.
- Temporarily defer administering the booster dose (12–15 months) of Hib vaccine for healthy children.
- Administer all recommended doses, including the 12–15 month booster dose only to children who fall into these high-risk categories: asplenia, sickle cell disease, HIV or other immunodeficiency syndromes and malignant neoplasms, American Indian and Alaskan Natives; if available, use pedvaxHIB® or Comvax® in this population, particularly in the first 6 months of life, as it leads to more rapid seroconversion.

### REFERENCES

1. Guidelines adapted from *MMWR* 2007;56 (Dispatch: 1–2. Available at: [www.cdc.gov/mmwr/preview/mmwrhtml/mmd56d1219al.htm?s\\_cid=mm56d1219al\\_e](http://www.cdc.gov/mmwr/preview/mmwrhtml/mmd56d1219al.htm?s_cid=mm56d1219al_e)).