

Recommended Childhood Immunization Schedule United States, January - December 2000

Vaccines¹ are listed under routinely recommended ages. **Solid-colored bars** indicate range of recommended ages for immunization. Any dose not given at the recommended age should be given as a "catch-up" immunization at any subsequent visit when indicated and feasible. **White-colored background bars** indicate vaccines to be given if previously recommended doses were missed or given earlier than the recommended minimum age.

Immunization	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	24 months	4-6 years	11-12 years	14-16 years	
Hepatitis B ²	#1				#3						Hep B		
		#2											
Hepatitis B (Recombivax only) ³											Hep B		
Diphtheria, Tetanus & Pertussis ⁴			#1	#2	#3		B1 ⁴			B2			
Tetanus & Diphtheria											B3		
H. Influenzae type b ⁵			#1	#2	#3	B1							
Polio ⁶			IPV #1	IPV #2	IPV #3 ⁶						IPV #4 ⁶		
Measles, Mumps & Rubella ⁷						#1				B1 ⁷	MMR ⁷		
Varicella ⁸						#1					Var ⁸		
Hepatitis A ⁹							Hep A ⁹ - in selected areas						
Pneumococcal ¹⁰			#1	#2	#3	B1							

Adapted from material approved by the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP).

On October 22, 1999, the Advisory Committee on Immunization Practices (ACIP) recommended that Rotashield[®] (RRV-TV), the only U.S.-licensed rotavirus vaccine, no longer be used in the United States ([MMWR, Volume 48, Number 43, Nov. 5, 1999](#)). Parents should be reassured that their children who received rotavirus vaccine before July are not at increased risk for intussusception now.

2000 Recommended Childhood Immunization Schedule

Footnotes

1. This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines as of November 1, 1999. 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 its other components are not contraindicated. Providers should consult the manufacturers' package inserts for detailed recommendations.
2. **Infants born to HBsAg-negative mothers** should receive the 1st dose of hepatitis B (Hep B) vaccine by age 2 months. The 2nd dose should be at least one month after the 1st dose. The 3rd dose should be administered at least 4 months after the 1st dose and at least 2 months after the 2nd dose, but not before 6 months of age for infants.
Infants born to HBsAg-positive mothers should receive hepatitis B vaccine and 0.5 ml hepatitis B immune globulin (HBIG) within 12 hours of birth at separate sites. The 2nd dose is recommended at 1 month of age and the 3rd dose at 6 months of age.
Infants born to mothers whose HBsAg status is unknown should receive hepatitis B vaccine within 12 hours of birth. Maternal blood should be drawn at the time of delivery to determine the mother's HBsAg status; if the HBsAg test is positive, the infant should receive HBIG as soon as possible (no later than 1 week of age).
All children and adolescents (through 18 years of age) who have not been immunized against hepatitis B may begin the series during any visit. Special efforts should be made to immunize children who were born in or whose parents were born in areas of the world with moderate or high endemicity of hepatitis B virus infection.
3. You now have the option to vaccinate adolescents 11-15 years of age according to either a 2- or a 3-dose hepatitis B immunization schedule. In September 1999, Merck Vaccine Division received approval for an optional 2-dose schedule of Recombivax HB (10 mcg) for adolescents aged 11-15 years. **The 2-dose schedule is only available using Recombivax 10 mcg, given at 0 and 4-6 months, and only for adolescents 11 through 15 years of age.** Adolescents who have already begun the 3-dose series with Recombivax (5 mcg) may NOT be switched to the new 2-dose series. Adolescents immunized according to the alternative schedule appear to develop immunity levels similar to those immunized with the 3-dose schedule, however, data on long-term immunity is not yet available.

 This newly approved 2-dose schedule will be available through the public funded vaccine distribution program following the CDC's negotiation of a vaccine contract for this alternative dosing schedule. Healthcare providers will receive information in *The Vac Scene* when the new schedule becomes available. (From [The Vac Scene, Vol. 6, No. 2, Mar/Apr 2000](#), Public Health - Seattle & King County)
4. The 4th dose of DTaP (diphtheria and tetanus toxoids and acellular pertussis vaccine) may be administered as early as 12 months of age, provided 6 months have elapsed since the 3rd dose and the child is unlikely to return at age 15-18 months. **Td** (tetanus and diphtheria toxoids) is recommended at 11-12 years of age if at least 5 years have elapsed since the last dose of DTP, DTaP or DT. Subsequent routine Td boosters are recommended every 10 years.
5. Three ***Haemophilus influenzae* type b** (Hib) conjugate vaccines are licensed for infant use. If PRP-OMP (PedvaxHIB[®] or ComVax[®] [Merck]) is administered at 2 and 4 months of age, a dose at 6 months is not required. Because clinical studies in infants have demonstrated that using some combination products may induce a lower immune response to the Hib vaccine component, DTaP/Hib combination products should not be used for primary immunization in infants at 2, 4 or 6 months of age, unless FDA-approved for these ages.
6. To eliminate the risk of vaccine-associated paralytic polio (VAPP), an all-IPV schedule is now recommended for routine childhood polio vaccination in the United States. All children should receive four doses of IPV at 2 months, 4 months, 6-18 months, and 4-6 years. OPV (if

available) may be used only for the following special circumstances:

1. Mass vaccination campaigns to control outbreaks of paralytic polio.
 2. Unvaccinated children who will be traveling in less than 4 weeks to areas where polio is endemic or epidemic.
 3. Children of parents who do not accept the recommended number of vaccine injections. These children may receive OPV only for the third or fourth dose or both; in this situation, health-care providers should administer OPV only after discussing the risk for VAPP with parents or caregivers.
 4. During the transition to an all-IPV schedule, recommendations for the use of remaining OPV supplies in physicians' offices and clinics have been issued by the American Academy of Pediatrics (see *Pediatrics*, December 1999).
7. The 2nd dose of **measles, mumps, and rubella** (MMR) vaccine is recommended routinely at 4-6 years of age but may be administered during any visit, provided at least 4 weeks have elapsed since receipt of the 1st dose and that both doses are administered beginning at or after 12 months of age. Those who have not previously received the second dose should complete the schedule by the 11-12 year old visit.
 8. **Varicella** (Var) vaccine is recommended at any visit on or after the first birthday for susceptible children, i.e., those who lack a reliable history of chickenpox (as judged by a health care provider) and who have not been immunized. Susceptible persons 13 years of age or older should receive 2 doses, given at least 4 weeks apart.
 9. **Hepatitis A** (Hep A) is shaded to indicate its recommended use in selected states and/or regions (these include Arkansas, Arizona, California, Idaho, New Mexico, Nevada, Oklahoma, Oregon, South Dakota, Utah, and Washington); consult your local public health authority. (Also see [MMWR Oct. 01, 1999/48\(RR12\)](#); 1-37).
 10. The first multivalent conjugate **pneumococcal vaccine** to prevent invasive disease caused by *Streptococcus pneumoniae* (pneumococcus) in infants and toddlers was approved by the FDA in February 2000. It is known as Prevnar[®] (dubbed "PCV7") and is manufactured by Wyeth-Lederle Vaccines. The vaccine contains the seven most common strains of pneumococcus that account for approximately 80% of invasive disease (e.g. bacteremia and meningitis) in infants.

With the decline of invasive Hib disease (since the advent of Hib conjugate vaccine), *S. pneumoniae* has become the leading cause of bacterial meningitis among children under 5 years of age in the U.S. Children under 1 year have the highest rates of pneumococcal meningitis, approximately 10 cases per 100,000 population.

Clinical trials included a large multicenter safety and efficacy study conducted at Northern California Kaiser Permanente. The controlled, double-blind trial enrolled approximately 38,000 children, about half of whom received Prevnar. In this trial, *the vaccine was 100% effective in preventing invasive pneumococcal disease* caused by the seven strains of pneumococcus in the vaccine. The vaccine was shown to be 90 percent effective in preventing invasive disease from illnesses caused by all pneumococcal subtypes. Children who received PCV7 had 8% fewer visits for tympanostomy tube placements. The duration of protection following PCV7 is currently unknown. Also, the effect of PCV7 on nasopharyngeal carriage of pneumococci is not clear at this time.

Side effects in the trials were generally mild and included local injection site reactions, irritability, drowsiness, and decreased appetite. Approximately 21 percent of the children had fevers over 100.3 compared to about 14 percent in the control group not receiving Prevnar.

The ACIP has published [recommendations](#) for the use of pneumococcal conjugate vaccine. ACIP recommends that children aged 24-59 months of age who are at high risk for pneumococcal infection be vaccinated with PCV7. The primary series consists of three IM injections routinely given at 2, 4, and 6 months of age with a fourth (booster) dose at 12-15

months of age. Until the vaccine is included on the federal contract, providers who *purchase* Prevnar may give the vaccine without a VIS. The cost per five-dose box is approximately \$290. (From [The Vac Scene, Vol. 6, No. 2](#), Public Health - Seattle & King County)

Minimum Age and Dosage Intervals

Vaccine	Minimum Age for First Dose ¹	Minimum Interval From Dose 1 to Dose 2 ¹	Minimum Interval From Dose 2 to Dose 3 ¹	Minimum Interval From Dose 3 to Dose 4 ¹
DTaP or DT	6 weeks ²	28 days	28 days	6 months
Td	7 years	28 days	6 months	
Hib (primary series)				
HibTITER [®] (HbOC)	6 weeks	28 days	28 days	3
ActHIB [™] (PRP-T)	6 weeks	1 month	1 month	3
PedivaxHIB [®] (PRP-OMP)	6 weeks	28 days	3	
Polio⁴	6 weeks ²	28 days	28 days ⁵	28 days ⁶
MMR	12 months ⁷	28 days		
Hepatitis B⁵	birth ⁵	28 days	2 months ⁸	
Varicella⁹	12 months ⁹	28 days		

1. These minimum acceptable ages and intervals may not correspond with the *optimal* recommended ages and intervals for vaccination.
2. The total number of doses of diphtheria and tetanus toxoids should not exceed six each before age 7 years.
3. The booster dose of Hib vaccine which is recommended following the primary vaccination series should be administered no earlier than 12 months of age *and* at least 2 months after the previous dose of Hib vaccine.
4. Applies to IPV and/or OPV.
5. For unvaccinated adults at increased risk of exposure to poliovirus with less than 3 months but more than 2 months available before protection is needed, three doses of IPV should be administered at least 28 days apart.
6. If the third dose is given after the fourth birthday, the fourth (booster) dose is not needed.
7. Measles vaccination may be given as early as 6 months in outbreak areas where cases are occurring in children under 1 year of age, however children initially vaccinated before the first birthday should be revaccinated at 12-15 months of age and an additional dose of vaccine should be administered at the time of school entry or according to local policy. Doses of MMR or other measles-containing vaccines should be separated by at least 28 days.
8. This final dose is recommended at least 4 months after the first dose and no earlier than 6 months of age.

9. One dose required prior to age 13 years; two doses required at least 28 days apart for age 13 years and older.

This table adapted from [ACIP's "General Recommendations on Immunization"](#)

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