

## Recommended Childhood Immunization Schedule, United States—January 1999 to December 1999

Vaccine*	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	4-6 years	11-12 years	14-16 years
Hepatitis B (Hep B)†	Hep B		Hep B		Hep B					Hep B	
Diphtheria, tetanus, pertussis‡			DTaP	DTaP	DTaP		DTaP‡		DTaP	Td	
Haemophilus influenzae type b (Hib)§			Hib	Hib	Hib	Hib					
Polio			IPV	IPV		Polio			Polio		
Rotavirus (Rv)¶			Rv¶	Rv¶	Rv¶						
Measles, mumps, rubella (MMR)#						MMR			MMR#	MMR#	
Varicella-zoster virus vaccine (Var)**						Var				Var**	

This schedule has been approved by the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics and the American Academy of Family Physicians (AAFP). It indicates the recommended ages for routine administration of currently licensed childhood vaccines. 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.

\*—Vaccines are listed under routinely recommended ages. Clear 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. Shaded ovals indicate vaccines to be given if previously recommended doses were missed or given earlier than the recommended minimum age.

†—Infants born to hepatitis B surface antigen (HBsAg)-negative mothers should receive the second dose of hepatitis B vaccine at least one month after the first dose. The third dose should be administered at least four months after the first dose and at least two months after the second dose, but not before six 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 second dose is recommended at one to two months of age and the third dose at six 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 one 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.

‡—Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP) is the preferred vaccine for all doses in the immunization series, including completion of the series in children who have received one or more doses of whole-cell diphtheria, tetanus, pertussis (DTP) vaccine. Whole-cell DTP is an acceptable alternative to DTaP. The fourth dose (DTP or DTaP) may be administered as early as 12 months of age, provided six months has elapsed since the third dose and if the child is unlikely to return at age 15 to 18 months. Tetanus and diphtheria toxoids (Td) is recommended at 11 to 12 years of age if at least five years has elapsed since the last dose of DTP, DTaP or DT. Subsequent routine Td boosters are recommended every 10 years.

§—Three Hib conjugate vaccines are licensed for infant use. If PRP-OMP (PedvaxHIB and COMVAX) is administered at two and four months of age, a dose at six 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 two, four or six months of age, unless it is approved by the U.S. Food and Drug Administration for these ages.

||—Two poliovirus vaccines currently are licensed in the United States: inactivated poliovirus vaccine (IPV) and oral poliovirus vaccine (OPV). The ACIP, AAP and the AAFP now recommend that the first two doses of poliovirus vaccine should be IPV. The ACIP continues to recommend a sequential schedule of two doses of IPV administered at ages two and four months, followed by two doses of OPV at 12 to 18 months and four to six years. Use of IPV for all doses also is acceptable and is recommended for immunocompromised persons and their household contacts. OPV is no longer recommended for the first two doses of the schedule and is acceptable only for special circumstances such as: children of parents who do not accept the recommended number of injections, late initiation of immunization which would require an unacceptable number of injections, and imminent travel to polio-endemic areas. OPV remains the vaccine of choice for mass immunization campaigns to control outbreaks due to wild poliovirus.

¶—Rotavirus vaccine is shaded and italicized to indicate: (1) health care providers may require time and resources to incorporate this new vaccine into practice; and (2) the AAFP feels that the decision to use rotavirus vaccine should be made by the parent or guardian in consultation with their physician or other health care provider. The first dose of Rv vaccine should not be administered before six weeks of age, and the minimum interval between doses is three weeks. The Rv vaccine series should not be initiated at seven months of age or older, and all doses should be completed by the first birthday.

#—The second dose of MMR vaccine is recommended routinely at four to six years of age but may be administered during any visit, provided at least four weeks has elapsed since receipt of the first 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- to 12-year-old visit.

\*\*—Var 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 two doses, given at least four weeks apart.

*This schedule is provided by the American Academy of Family Physicians only as an assistance for physicians making clinical decisions regarding the care of their patients. As such, they cannot substitute for the individual judgment brought to each clinical situation by the patient's family physician. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but they should be used with the clear understanding that continued research may result in new knowledge and recommendations.*