APPENDIX A

Schedules and Recommendations

Appendix A

Immunization Schedules on the Web

Childhood and Adolescent Immunization Schedule Schedule: www.cdc.gov/vaccines/recs/schedules/child-schedule.htm

Contains:

- English and Spanish versions
- Color and black & white versions
- 4-page, 2-page, and pocket-size versions
- Palm OS and Pocket PC Handheld versions
- Screenreader accessible version
- Downloadable files for office printing or commercial printing
- Link to past years' schedules
- Interactive childhood vaccine scheduler
- more . . .

Adult Immunization Schedule Schedule:

www.cdc.gov/vaccines/recs/schedules/adult-schedule.htm

Contains:

- Color and black & white versions
- 4-page, 2-page, and pocket-size versions
- Downloadable files for office printing or commercial printing
- Screenreader accessible version
- Summary of changes since last year's version
- Adult vaccination screening form
- Adult and adolescent vaccine "quiz"
- more . . .

Appendix A

Recommended Immunization Schedule for Persons Aged 0–6 Years—UNITED STATES • 2008

For those who fall behind or start late, see the catch-up schedule

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[1]	HepB	HepB		*see footnote 1*	HepB						
Rotavirus[2]			Rota	Rota	Rota						
Diphtheria, Tetanus, Pertussis[3]			DTaP	DTaP	DTaP	*see footnote 3*	DTaP				DTaP
Haemophilus influenzae type b[4]			Hib	Hib	*Hib*[4]	Hib					
Pneumococcal[5]			PCV	PCV	PCV	PCV				PPV	
Inactivated Poliovirus			IPV	IPV	IPV		IPV				IPV
Influenza[6]					Influenza (Yearly)						
Measles, Mumps, Rubella[7]						MMR					MMR
Varicella[8]						Varicella					Varicella
Hepatitis A[9]						HepA (2 doses)				HepA Series	
Meningococcal[10]										MCV4	

Range of recommended ages

Certain high-risk groups

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2007, for children aged 0 through 6 years. Additional information is available at **www.cdc.gov/vaccines/recs/schedules**. Any dose not administered at the recommended age should be administered at any subsequent visit, when indicated and feasible. 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 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 the respective Advisory Committee on Immunization Practices statement for detailed recommendations, including for **high-risk conditions: http://www.cdc.gov/vaccines/pubs/ACIP-list.htm**. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at **www.vaers.hhs.gov** or by telephone, **800-822-7967**.

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 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).
- If mother is HBsAg negative, the birth dose can be delayed, in rare cases, with a provider's order and a copy of the mother's negative HBsAg laboratory report 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 any 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® [Merck]) 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 eligible 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 persons in groups at higher risk, and to any child whose parents request vaccination.
- For healthy 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 age 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 second dose at age 4–6 years; may be administered 3 months or more after first dose.
- Do not repeat second dose if administered 28 days or more after first dose.

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

- Administer to all children aged 1 year (i.e., aged 12–23 months). Administer the 2 doses in the series 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 vaccine. *(Minimum age: 2* years *for meningococcal conjugate vaccine (MCV4) and for meningococcal polysaccharide vaccine (MPSV4))*

- Administer MCV4 to children aged 2–10 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high-risk groups. MPSV4 is also acceptable.
- Administer MCV4 to persons who received MPSV4 3 or more years previously and remain at increased risk for meningococcal disease.

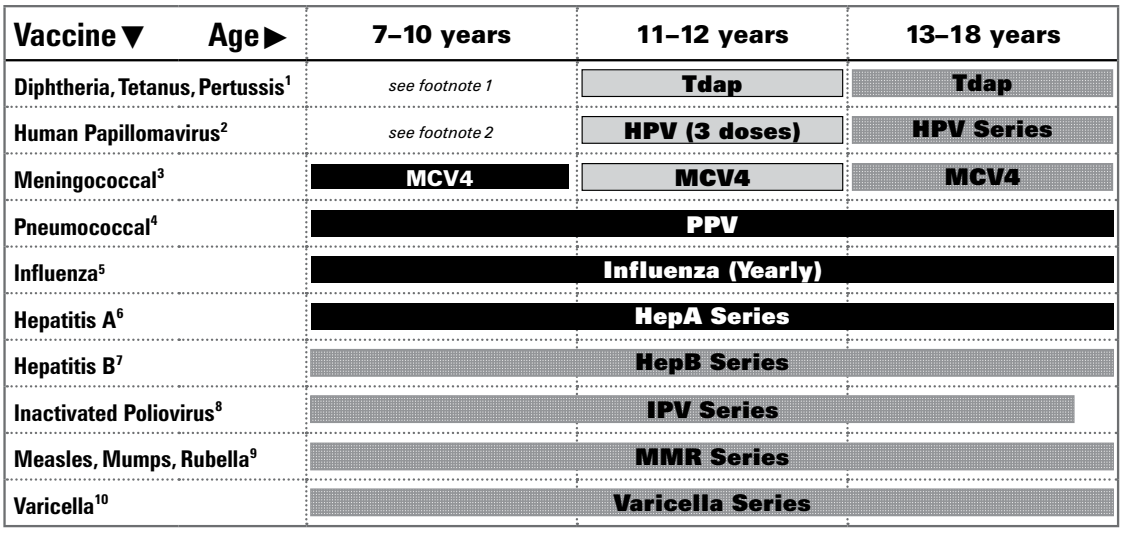
The Recommended Immunization Schedules for Persons Aged 0–18 Years are approved by the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/recs/acip), the American Academy of Pediatrics (http://www.aap.org), and the American Academy of Family Physicians (http://www.aafp.org).

DEPARTMENT OF HEALTH AND HUMAN SERVICES • CENTERS FOR DISEASE CONTROL AND PREVENTION • SAFER • HEATHIER • PEOPLE™

CS103164

Recommended Immunization Schedule for Persons Aged 7–18 Years—UNITED STATES • 2008

For those who fall behind or start late, see the green bars and the catch-up schedule



This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2007, for children aged 7–18 years. Additional information is available at **www.cdc.gov/vaccines/recs/schedules**. Any dose not administered at the recommended age should be administered at any subsequent visit, when indicated and feasible. 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 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 the respective Advisory Committee on Immunization Practices statement for detailed recommendations, including for **high-risk conditions: http://www.cdc.gov/vaccines/pubs/ACIP-list.htm**. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at **www.vaers.hhs.gov** or by telephone, **800-822-7967**.

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/DTaP vaccination series and have not received a tetanus and diphtheria toxoids (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/DTaP 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 years 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 or more years previously 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).
- Administer the 2 doses in the series 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 following the first dose.
- Administer 2 doses of varicella vaccine to persons aged 13 years or older at least 4 weeks apart.

The Recommended Immunization Schedules for Persons Aged 0–18 Years are approved by the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/recs/acip), the American Academy of Pediatrics (http://www.aap.org), and the American Academy of Family Physicians (http://www.aafp.org).

DEPARTMENT OF HEALTH AND HUMAN SERVICES • CENTERS FOR DISEASE CONTROL AND PREVENTION
SAFER • HEALTHIER • PEOPLE™

CS103164

Appendix A

Catch-up Immunization Schedule for Persons Aged 4 Months–18 Years Who Start Late or Who Are More Than 1 Month Behind

UNITED STATES • 2008

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 section appropriate for the child's age.

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
CATCH-UP SCHEDULE FOR PERSONS AGED 4 MONTHS–6 YEARS					
Hepatitis B[1]	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Rotavirus[2]	6 wks	4 weeks	4 weeks		
Diphtheria, Tetanus, Pertussis[3]	6 wks	4 weeks	4 weeks	6 months	6 months[3]
Haemophilus influenzae type b[4]	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 age 12-14 months No further doses needed if first dose administered at 15 months of age or older	4 weeks[4] if current age is younger than 12 months 8 weeks (as final dose)[4] if current age is 12 months or older and second dose administered at younger than 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[5]	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 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 is younger than 12 months 8 weeks (as final dose) if current age is 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[6]	6 wks	4 weeks	4 weeks	4 weeks[6]	
Measles, Mumps, Rubella[7]	12 mos	4 weeks			
Varicella[8]	12 mos	3 months			
Hepatitis A[9]	12 mos	6 months			
CATCH-UP SCHEDULE FOR PERSONS AGED 7–18 YEARS					
Tetanus, Diphtheria/ Tetanus, Diphtheria, Pertussis[10]	7 yrs[10]	4 weeks	4 weeks if first dose administered at younger than 12 months of age 6 months if first dose administered at age 12 months or older	6 months if first dose administered at younger than 12 months of age	
Human Papillomavirus[11]	9 yrs	4 weeks	12 weeks (and 24 weeks after the first dose)		
Hepatitis A[9]	12 mos	6 months			
Hepatitis B[1]	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Inactivated Poliovirus[6]	6 wks	4 weeks	4 weeks	4 weeks[6]	
Measles, Mumps, Rubella[7]	12 mos	4 weeks			
Varicella[8]	12 mos	4 weeks if first dose administered at age 13 years or older 3 months if first dose administered at younger than 13 years of age			

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 aged 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 (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.
- 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 less than 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 younger than 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(No. RR-3).

11. Human papillomavirus vaccine (HPV).
- Administer the HPV vaccine series to females at age 13–18 years if not previously vaccinated.

Information about reporting reactions after immunization is available online at **http://www.vaers.hhs.gov** or by telephone via the 24-hour national toll-free information line 800-822-7967. Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for immunization, is available from the National Center for Immunization and Respiratory Diseases at **http://www.cdc.gov/vaccines** or telephone, **800-CDC-INFO** (**800-232-4636**).

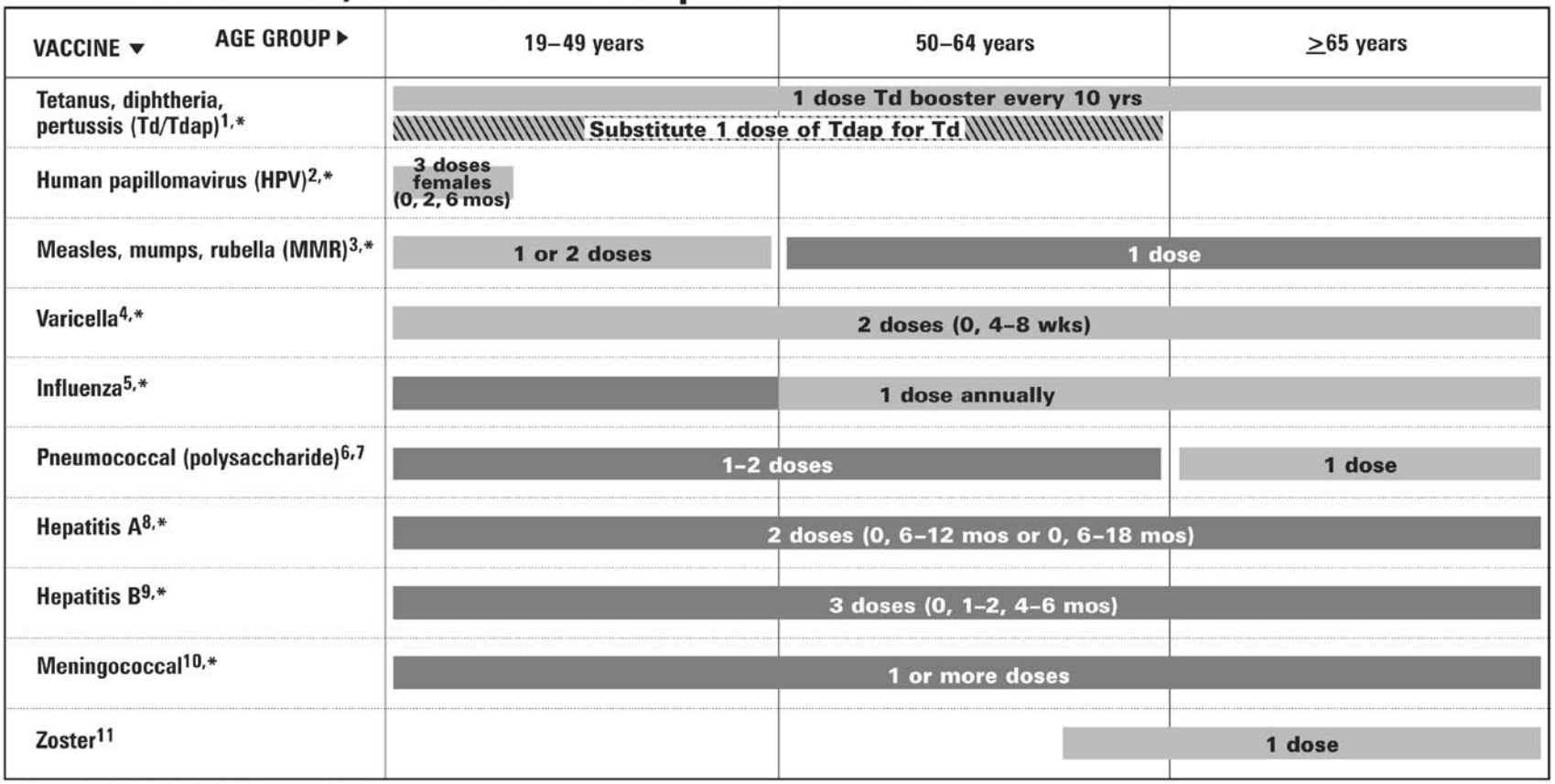
DEPARTMENT OF HEALTH AND HUMAN SERVICES • CENTERS FOR DISEASE CONTROL AND PREVENTION • SAFER • HEALTHIER • PEOPLE

CS113897

Recommended Adult Immunization Schedule

Note: These recommendations must be read with the footnotes that follow.

Figure 1. Recommended adult immunization schedule, by vaccine and age group United States, October 2007 – September 2008



*Covered by the Vaccine Injury Compensation Program.

For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

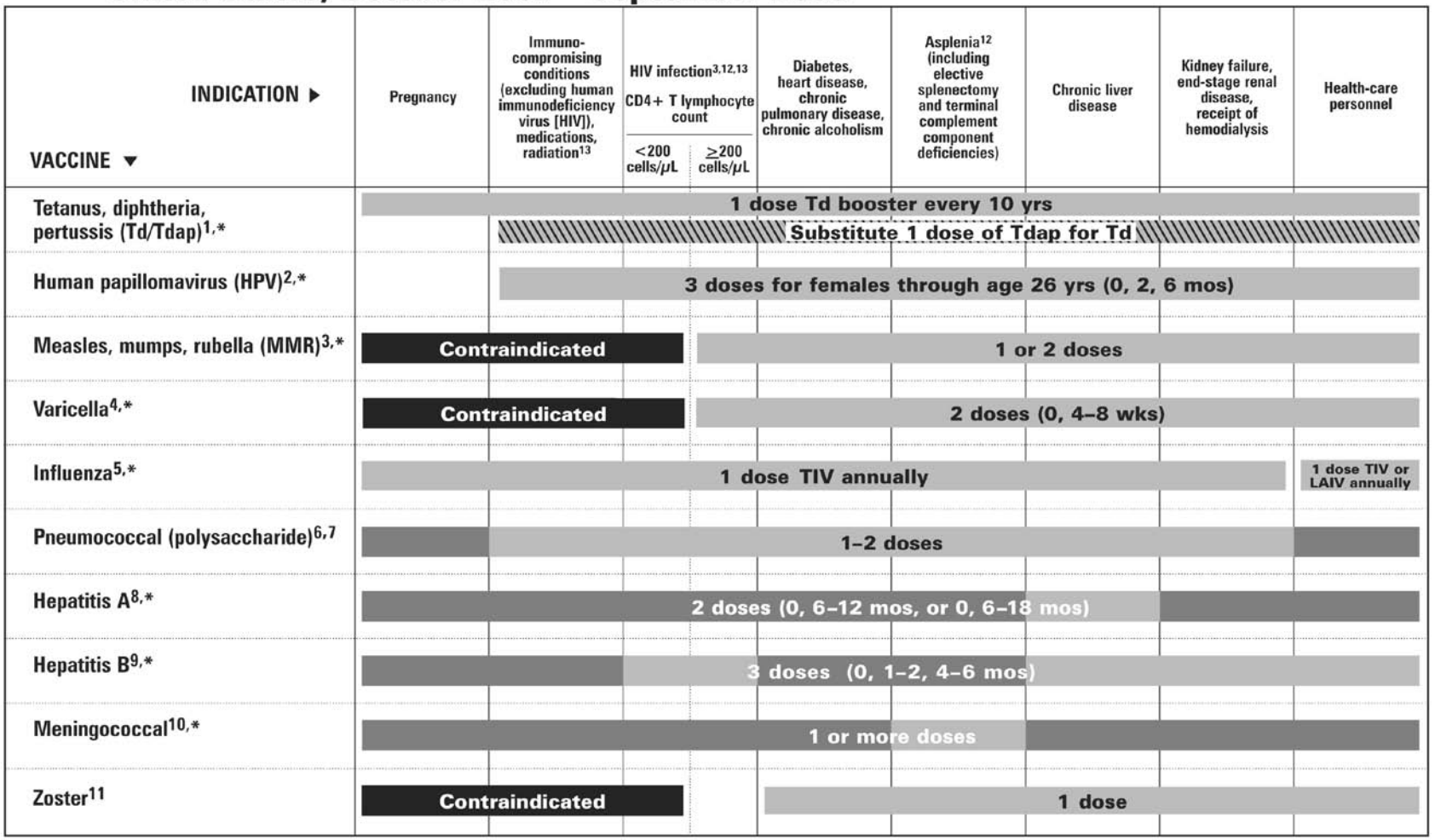
Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 24 hours a day, 7 days a week.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

Figure 2. Vaccines that might be indicated for adults based on medical and other indications United States, October 2007 – September 2008



*Covered by the Vaccine Injury Compensation Program.

For all persons in this category who meet the age requirements and who lack evidence of immunity (e.g., lack documentation of vaccination or have no evidence of prior infection)

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly indicated for adults ages 19 years and older, as of October 1, 2007. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/pubs/acip-list.htm).

CS115143

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the American College of Obstetricians and Gynecologists (ACOG), and the American College of Physicians (ACP).

DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

Footnotes

Recommended Adult Immunization Schedule · United States, October 2007 – September 2008

For complete statements by the Advisory Committee on Immunization Practices (ACIP), visit www.cdc.gov/vaccines/pubs/ACIP-list.htm.

1. Tetanus, diphtheria, and acellular pertussis (Td/Tdap) vaccination

Tdap should replace a single dose of Td for adults aged <65 years who have not previously received a dose of Tdap. Only one of two Tdap products (Adacel® [sanofi pasteur]) is licensed for use in adults.

Adults with uncertain histories of a complete primary vaccination series with tetanus and diphtheria toxoid–containing vaccines should begin or complete a primary vaccination series. A primary series for adults is 3 doses of tetanus and diphtheria toxoid–containing vaccines; administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second. However, Tdap can substitute for any one of the doses of Td in the 3-dose primary series. The booster dose of tetanus and diphtheria toxoid–containing vaccine should be administered to adults who have completed a primary series and if the last vaccination was received ≥10 years previously. Tdap or Td vaccine may be used, as indicated.

If the person is pregnant and received the last Td vaccination ≥10 years previously, administer Td during the second or third trimester; if the person received the last Td vaccination in <10 years, administer Tdap during the immediate postpartum period. A one-time administration of 1 dose of Tdap with an interval as short as 2 years from a previous Td vaccination is recommended for postpartum women, close contacts of infants aged <12 months, and all health-care workers with direct patient contact. In certain situations, Td can be deferred during pregnancy and Tdap substituted in the immediate postpartum period, or Tdap can be administered instead of Td to a pregnant woman after an informed discussion with the woman.

Consult the ACIP statement for recommendations for administering Td as prophylaxis in wound management.

2. Human papillomavirus (HPV) vaccination

HPV vaccination is recommended for all females aged ≤26 years who have not completed the vaccine series. History of genital warts, abnormal Papanicolaou test, or positive HPV DNA test is not evidence of prior infection with all vaccine HPV types; HPV vaccination is still recommended for these persons.

Ideally, vaccine should be administered before potential exposure to HPV through sexual activity; however, females who are sexually active should still be vaccinated. Sexually active females who have not been infected with any of the HPV vaccine types receive the full benefit of the vaccination. Vaccination is less beneficial for females who have already been infected with one or more of the HPV vaccine types.

A complete series consists of 3 doses. The second dose should be administered 2 months after the first dose; the third dose should be administered 6 months after the first dose.

Although HPV vaccination is not specifically recommended for females with the medical indications described in Figure 2, "Vaccines that might be indicated for adults based on medical and other indications," it is not a live-virus vaccine and can be administered. However, immune response and vaccine efficacy might be less than in persons who do not have the medical indications described or who are immunocompetent.

3. Measles, mumps, rubella (MMR) vaccination

Measles component: Adults born before 1957 can be considered immune to measles. Adults born during or after 1957 should receive ≥1 dose of MMR unless they have a medical contraindication, documentation of ≥1 dose, history of measles based on health-care provider diagnosis, or laboratory evidence of immunity.

A second dose of MMR is recommended for adults who 1) have been recently exposed to measles or are in an outbreak setting; 2) have been previously vaccinated with killed measles vaccine; 3) have been vaccinated with an unknown type of measles vaccine during 1963–1967; 4) are students in postsecondary educational institutions; 5) work in a health-care facility; or 6) plan to travel internationally.

Mumps component: Adults born before 1957 can generally be considered immune to mumps. Adults born during or after 1957 should receive 1 dose of MMR unless they have a medical contraindication, history of mumps based on health-care provider diagnosis, or laboratory evidence of immunity.

A second dose of MMR is recommended for adults who 1) are in an age group that is affected during a mumps outbreak; 2) are students in postsecondary educational institutions; 3) work in a health-care facility; or 4) plan to travel internationally. For unvaccinated health-care workers born before 1957 who do not have other evidence of mumps immunity, consider administering 1 dose on a routine basis and strongly consider administering a second dose during an outbreak.

Rubella component: Administer 1 dose of MMR vaccine to women whose rubella vaccination history is unreliable or who lack laboratory evidence of immunity. For women of childbearing age, regardless of birth year, routinely determine rubella immunity and counsel women regarding congenital rubella syndrome. Women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the health-care facility.

4. Varicella vaccination

All adults without evidence of immunity to varicella should receive 2 doses of single-antigen varicella vaccine unless they have a medical contraindication. Special consideration should be given to those who 1) have close contact with persons at high risk for severe disease (e.g., health-care personnel and family contacts of immunocompromised persons) or 2) are at high risk for exposure or transmission (e.g., teachers; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adolescents and adults living in households with children; nonpregnant women of childbearing age; and international travelers).

Evidence of immunity to varicella in adults includes any of the following: 1) documentation of 2 doses of varicella vaccine at least 4 weeks apart; 2) U.S.-born before 1980 (although for health-care personnel and pregnant women birth before 1980 should not be considered evidence of immunity); 3) history of varicella based on diagnosis or verification of varicella by a health-care provider (for a patient reporting a history of or presenting with an atypical case, a mild case, or both, health-care providers should seek either an epidemiologic link with a typical varicella case or to a laboratory-confirmed case or evidence of laboratory confirmation, if it was performed at the time of acute disease); 4) history of herpes zoster based on health-care provider diagnosis; or 5) laboratory evidence of immunity or laboratory confirmation of disease.

Assess pregnant women for evidence of varicella immunity. Women who do not have evidence of immunity should receive the first dose of varicella vaccine upon completion or termination of pregnancy and before discharge from the health-care facility. The second dose should be administered 4–8 weeks after the first dose.

5. Influenza vaccination

Medical indications: Chronic disorders of the cardiovascular or pulmonary systems, including asthma; chronic metabolic diseases, including diabetes mellitus, renal or hepatic dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications or human immunodeficiency virus [HIV]); any condition that compromises respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration (e.g., cognitive dysfunction, spinal cord injury, or seizure disorder or other neuromuscular disorder); and pregnancy during the influenza season. No data exist on the risk for severe or complicated influenza disease among persons with asplenia; however, influenza is a risk factor for secondary bacterial infections that can cause severe disease among persons with asplenia.

Occupational indications: Health-care personnel and employees of long-term care and assisted-living facilities.

Other indications: Residents of nursing homes and other long-term care and assisted-living facilities; persons likely to transmit influenza to persons at high risk (e.g., in-home household contacts and caregivers of children aged 0–59 months, or persons of all ages with high-risk conditions); and anyone who would like to be vaccinated. Healthy, nonpregnant adults aged ≤49 years without high-risk medical conditions who are not contacts of severely immunocompromised persons in special care units can receive either intranasally administered live, attenuated influenza vaccine (FluMist®) or inactivated vaccine. Other persons should receive the inactivated vaccine.

6. Pneumococcal polysaccharide vaccination

Medical indications: Chronic pulmonary disease (excluding asthma); chronic cardiovascular diseases; diabetes mellitus; chronic liver diseases, including liver disease as a result of alcohol abuse (e.g., cirrhosis); chronic alcoholism, chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]); immunosuppressive conditions; and cochlear implants and cerebrospinal fluid leaks. Vaccinate as close to HIV diagnosis as possible.

Other indications: Alaska Natives and certain American Indian populations and residents of nursing homes or other long-term care facilities.

7. Revaccination with pneumococcal polysaccharide vaccine

One-time revaccination after 5 years for persons with chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); or immunosuppressive conditions. For persons aged ≥65 years, one-time revaccination if they were vaccinated ≥5 years previously and were aged <65 years at the time of primary vaccination.

8. Hepatitis A vaccination

Medical indications: Persons with chronic liver disease and persons who receive clotting factor concentrates.

Behavioral indications: Men who have sex with men and persons who use illegal drugs.

Occupational indications: Persons working with hepatitis A virus (HAV)–infected primates or with HAV in a research laboratory setting.

Other indications: Persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (a list of countries is available at wwwn.cdc.gov/travel/contentdiseases.aspx) and any person seeking protection from HAV infection.

Single-antigen vaccine formulations should be administered in a 2-dose schedule at either 0 and 6–12 months (Havrix®), or 0 and 6–18 months (Vaqta®). If the combined hepatitis A and hepatitis B vaccine (Twinrix®) is used, administer 3 doses at 0, 1, and 6 months.

9. Hepatitis B vaccination

Medical indications: Persons with end-stage renal disease, including patients receiving hemodialysis; persons seeking evaluation or treatment for a sexually transmitted disease (STD); persons with HIV infection; and persons with chronic liver disease.

Occupational indications: Health-care personnel and public-safety workers who are exposed to blood or other potentially infectious body fluids.

Behavioral indications: Sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than 1 sex partner during the previous 6 months); current or recent injection-drug users; and men who have sex with men.

Other indications: Household contacts and sex partners of persons with chronic hepatitis B virus (HBV) infection; clients and staff members of institutions for persons with developmental disabilities; international travelers to countries with high or intermediate prevalence of chronic HBV infection (a list of countries is available at wwwn.cdc.gov/travel/contentdiseases.aspx); and any adult seeking protection from HBV infection.

Settings where hepatitis B vaccination is recommended for all adults: STD treatment facilities; HIV testing and treatment facilities; facilities providing drug-abuse treatment and prevention services; health-care settings targeting services to injection-drug users or men who have sex with men; correctional facilities; end-stage renal disease programs and facilities for chronic hemodialysis patients; and institutions and nonresidential daycare facilities for persons with developmental disabilities.

Special formulation indications: For adult patients receiving hemodialysis and other immunocompromised adults, 1 dose of 40 μg/mL (Recombivax HB®), or 2 doses of 20 μg/mL (Engerix-B®) administered simultaneously.

10. Meningococcal vaccination

Medical indications: Adults with anatomic or functional asplenia, or terminal complement component deficiencies.

Other indications: First-year college students living in dormitories; microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*; military recruits; and persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the "meningitis belt" of sub-Saharan Africa during the dry season [December–June]), particularly if their contact with local populations will be prolonged. Vaccination is required by the government of Saudi Arabia for all travelers to Mecca during the annual Hajj.

Meningococcal conjugate vaccine is preferred for adults with any of the preceding indications who are aged ≤55 years, although meningococcal polysaccharide vaccine (MPSV4) is an acceptable alternative. Revaccination after 3–5 years might be indicated for adults previously vaccinated with MPSV4 who remain at increased risk for infection (e.g., persons residing in areas in which disease is epidemic).

11. Herpes zoster vaccination

A single dose of zoster vaccine is recommended for adults aged ≥60 years regardless of whether they report a prior episode of herpes zoster. Persons with chronic medical conditions may be vaccinated unless a contraindication or precaution exists for their condition.

12. Selected conditions for which *Haemophilus influenzae* type b (Hib) vaccine may be used

Hib conjugate vaccines are licensed for children aged 6 weeks–71 months. No efficacy data are available on which to base a recommendation concerning use of Hib vaccine for older children and adults with the chronic conditions associated with an increased risk for Hib disease. However, studies suggest good immunogenicity in patients who have sickle cell disease, leukemia, or HIV infection or who have had splenectomies; administering vaccine to these patients is not contraindicated.

13. Immunocompromising conditions

Inactivated vaccines are generally acceptable (e.g., pneumococcal, meningococcal, and influenza [trivalent inactivated influenza vaccine]), and live vaccines generally are avoided in persons with immune deficiencies or immune suppressive conditions. Information on specific conditions is available at www.cdc.gov/vaccines/pubs/acip-list.htm.

Appendix A

Recommended and Minimum Ages and Intervals Between Doses of Routinely Recommended Vaccines[1]				
Vaccine and dose number	**Recommended age for this dose**	**Minimum age for this dose**	**Recommended interval to next dose**	**Minimum interval to next dose**
Hepatitis B (HepB)-1[2]	Birth	Birth	1-4 months	4 weeks
HepB-2	1-2 months	4 weeks	2-17 months	8 weeks
HepB-3[3]	6-18 months	24 weeks	–	–
Diphtheria-tetanus-acellular pertussis (DTaP)-1[2]	2 months	6 weeks	2 months	4 weeks
DTaP-2	4 months	10 weeks	2 months	4 weeks
DTaP-3	6 months	14 weeks	6-12 months[4]	6 months[4,5]
DTaP-4	15-18 months	12 months	3 years	6 months[4]
DTaP-5	4-6 years	4 years	–	–
Haemophilus influenzae type b (Hib)-1[2,6]	2 months	6 weeks	2 months	4 weeks
Hib-2	4 months	10 weeks	2 months	4 weeks
Hib-3[7]	6 months	14 weeks	6-9 months[4]	8 weeks
Hib-4	12-15 months	12 months	–	–
Inactivated poliovirus (IPV)-1[2]	2 months	6 weeks	2 months	4 weeks
IPV-2	4 months	10 weeks	2-14 months	4 weeks
IPV-3	6-18 months	14 weeks	3-5 years	4 weeks
IPV-4	4-6 years	18 weeks	–	–
Pneumococcal conjugate (PCV)-1[6]	2 months	6 weeks	2 months	4 weeks
PCV-2	4 months	10 weeks	2 months	4 weeks
PCV-3	6 months	14 weeks	6 months	8 weeks
PCV-4	12-15 months	12 months	–	–
Measles-mumps-rubella (MMR)-1[8]	12-15 months	12 months	3-5 years	4 weeks
MMR-2[8]	4-6 years	13 months	–	–
Varicella (Var)-1[8]	12-15 months	12 months	3-5 years	12 weeks [9]
Var-2[8]	4-6 years	15 months	–	–
Hepatitis A (HepA)-1[2]	12-23 months	12 months	6-18 months[4]	6 months[4]
HepA-2	18-41 months	18 months	–	–
Influenza, Inactivated (TIV)[10]	6-59 months	6 months[11]	1 month	4 weeks
Influenza, Live attenuated (LAIV)[10]	–	2 years	1 month	4 weeks
Meningococcal Conjugate (MCV)	11-12 years	2 years	–	–
Meningococcal Polysaccharide (MPSV)-1	–	2 years	5 years[12]	5 years[12]
MPSV-2[13]	–	7 years	–	–
Tetanus-diphtheria (Td)	11-12 years	7 years	10 years	5 years
Tetanus-diphtheria-acellular pertussis (Tdap)[14]	≥11 years	10 years	–	–
Pneumococcal polysaccharide (PPV)-1	–	2 years	5 years	5 years
PPV-2[15]	–	7 years	–	–

Vaccine and dose number	Recommended age for this dose	Minimum age for this dose	Recommended interval to next dose	Minimum interval to next dose
Human papillomavirus (HPV)-1[16]	11-12 years	9 years	2 months	4 weeks
HPV-2	11-12 years (+2 months)	109 months	4 months	12 weeks
HPV-3[17]	11-12 years (+6 months)	114 months	–	–
Rotavirus (Rota)-1[18]	2 months	6 weeks	2 months	4 weeks
Rota-2	4 months	10 weeks	2 months	4 weeks
Rota-3	6 months	14 weeks	–	–
Zoster[19]	60 years	60 years	–	–

1 Use of licensed combination vaccines is preferred over separate injections of their equivalent component vaccines. (CDC. Combination vaccines for childhood immunization: recommendations of the Advisory Committee on Immunization Practices [ACIP], the American Academy of Pediatrics [AAP], and the American Academy of Family Physicians [AAFP]. *MMWR* 1999;48[No. RR-5]). When administering combination vaccines, the minimum age for administration is the oldest age for any of the individual components; the minimum interval between doses is equal to the greatest interval of any of the individual components.

2 Combination vaccines containing the Hepatitis B component are available (HepB-Hib, DTaP-HepB-IPV, HepA-HepB). These vaccines should not be administered to infants younger than 6 weeks of age because of the other components (i.e., Hib, DTaP, IPV, and HepA).

3 HepB-3 should be administered at least 8 weeks after HepB-2 and at least 16 weeks after HepB-1, and it should not be administered before age 24 weeks.

4 Calendar months.

5 The minimum recommended interval between DTaP-3 and DTaP-4 is 6 months. However, DTaP-4 need not be repeated if administered at least 4 months after DTaP-3.

6 For Hib and PCV, children receiving the first dose of vaccine at age 7 months of age or older require fewer doses to complete the series (CDC. Recommended childhood and adolescent immunization schedule – United States, 2006. *MMWR* 2005; 54 [Nos. 51 & 52]:Q1-Q4).

7 If PRP-OMP (Pedvax-Hib®, Merck Vaccine Division), was administered at 2 and 4 months of age a dose at 6 months of age is not required.

8 Combination measles-mumps-rubella-varicella (MMRV) vaccine can be used for children 12 months through 12 years of age. Also see footnote 9.

9 The minimum interval from Var-1 to Var-2 for persons beginning the series at 13 years or older is 4 weeks.

10 One dose of influenza vaccine per season is recommended for most people. Children younger than 9 years of age who are receiving influenza vaccine for the first time, or received only 1 dose the previous season (if it was their first vaccination season) should receive 2 doses this season.

11 The minimum age for inactivated influenza vaccine varies by vaccine manufacturer. Only Fluzone (manufactured by sanofi pasteur) is approved for children 6-35 months of age. The minimum age for Fluvirin (manufactured by Novartis) is 4 years. For Fluarix and FluLaval (manufactured by GlaxoSmithKline) and Afluria (manufactured by CSL Ltd), the minimum age is 18 years.

12 Some experts recommend a second dose of MPSV-3 years after the first dose for people at increased risk for meningococcal disease.

13 A second dose of meningococcal vaccine is recommended for people previously vaccinated with MPSV who remain at high risk for meningococcal disease. MCV is preferred when revaccinating persons aged 2-55 years, but a second dose of MPSV is acceptable. (CDC. Prevention and Control of Meningococcal Disease Recommendations of the Advisory Committee on Immunization Practices [ACIP]. *MMWR* 2005; 54: No. RR-7.)

14 Only one dose of Tdap is recommended. Subsequent doses should be administered as Td. If vaccination to prevent tetanus and/or diphtheria disease is required for children 7 through 9 years of age, Td should be administered (minimum age for Td is 7 years). For one brand of Tdap the minimum age is 11 years. The preferred interval between Tdap and a previous dose of Td is 5 years. In persons who have received a primary series of tetanus-toxoid containing vaccine, for management of a tetanus-prone wound, the minimum interval after a previous dose of any tetanus-containing vaccine is 5 years.

15 A second dose of PPV is recommended for persons at highest risk for serious pneumococcal infection and those who are likely to have a rapid decline in pneumococcal antibody concentration. Revaccination 3 years after the previous dose can be considered for children at highest risk for severe pneumococcal infection who would be younger than 10 years of age at the time of revaccination. (CDC. Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices [ACIP]. *MMWR* 1997;46[No. RR-8]).

16 HPV is approved only for females 9-26 years of age.

17 HPV-3 should be administered at least 12 weeks after HPV-2 and at least 24 weeks after HPV-1, and it should not be administered before 114 months of age.

18 The first dose of Rota must be administered at 6-12 weeks of age. The vaccine series should not be started at 13 weeks of age or older. Rota should not be administered to children 33 weeks of age or older regardless of the number of doses received between 6 and 32 weeks of age.

19 Herpes zoster vaccine is approved as a single dose for persons 60 years and older with a history of varicella.

Adapted from Table 1, ACIP General Recommendations on Immunization: *MMWR* 2006;55(No. RR-15) February 2008

Summary of Recommendations for Childhood and Adolescent Immunization (Page 1 of 3)

Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccination and related issues	Contraindications and precautions (mild illness is not a contraindication)
Hepatitis B *Give IM*	• Vaccinate all children age 0 through 18yrs. • Vaccinate all newborns with monovalent vaccine prior to hospital discharge. Give dose #2 at age 1–2m and the final dose at age 6–18m (the last dose in the infant series should not be given earlier than age 24wks). After the birth dose, the series may be completed using 2 doses of single-antigen vaccine or up to 3 doses of Comvax (ages 2m, 4m, 12–15m) or Pediarix (ages 2m, 4m, 6m), which may result in giving a total of 4 doses of hepatitis B vaccine. • **If mother is HBsAg-positive:** give the newborn HBIG + dose #1 within 12hrs of birth; complete series at age 6m or, if using Comvax, at age 12–15m. • **If mother's HBsAg status is unknown:** give the newborn dose #1 within 12hrs of birth. If mother is subsequently found to be HBsAg positive, give infant HBIG within 7d of birth and follow the schedule for infants born to HBsAg-positive mothers.	• Do not restart series, no matter how long since previous dose. • 3-dose series can be started at any age. • Minimum spacing between doses: 4wks between #1 and #2, 8wks between #2 and #3, and at least 16wks between #1 and #3 (e.g., 0-, 2-, 4m; 0-, 1-, 4m). **Special Notes on Hepatitis B Vaccine (HepB)** **Dosing of HepB:** Vaccine brands are interchangeable. For persons age 0 through 19yrs, give 0.5 mL of either Engerix-B or Recombivax HB. **Alternative dosing schedule for unvaccinated adolescents age 11 through 15yrs:** Give 2 doses Recombivax HB 1.0 mL (adult formulation) spaced 4–6m apart. (Engerix-B is not licensed for a 2-dose schedule.) **For preterm infants:** Consult ACIP hepatitis B recommendations (*MMWR* 2005; 54 [RR-16]).	**Contraindication** Previous anaphylaxis to this vaccine or to any of its components. **Precaution** Moderate or severe acute illness.
DTaP, DT (Diphtheria, tetanus, acellular pertussis) *Give IM*	• Give to children at ages 2m, 4m, 6m, 15–18m, 4–6yrs. • May give dose #1 as early as age 6wks. • May give #4 as early as age 12m if 6m have elapsed since #3 and the child is unlikely to return at age 15–18m. • Do not give DTaP/DT to children age 7yrs and older. • If possible, use the same DTaP product for all doses.	• #2 and #3 may be given 4wks after previous dose. • #4 may be given 6m after #3. • If #4 is given before 4th birthday, wait at least 6m for #5 (age 4–6yrs). • If #4 is given after 4th birthday, #5 is not needed.	**Contraindications** • Previous anaphylaxis to this vaccine or to any of its components. • For DTaP/Tdap only: encephalopathy within 7d after DTP/DTaP. **Precautions** • Moderate or severe acute illness. • Guillain-Barré syndrome within 6wks after previous dose of tetanus toxoid-containing vaccine. • For DTaP only: Any of these events following a previous dose of DTP/DTaP: 1) temperature of 105°F (40.5°C) or higher within 48hrs; 2) continuous crying for 3hrs or more within 48hrs; 3) collapse or shock-like state within 48hrs; 4) convulsion with or without fever within 3d. • For DTaP/Tdap only: Unstable neurologic disorder. • For Td/Tdap only: History of Arthus reaction following a prior dose of tetanus- and/or diphtheria-toxoid-containing vaccine, including MCV4. **Note:** Use of Td or Tdap is not contraindicated in pregnancy. At the provider's discretion, either vaccine may be administered during the 2nd or 3rd trimester.
Td, Tdap (Tetanus, diphtheria, acellular pertussis) *Give IM*	• Give 1-time Tdap dose to adolescents age 11–12yrs if 5yrs have elapsed since last dose DTaP/DTP; boost every 10yrs with Td. • Give 1-time dose of Tdap to all adolescents who have not received previous Tdap. Special efforts should be made to give Tdap to persons age 11yrs and older who are - in contact with infants younger than age 12m. - healthcare workers with direct patient contact. • In pregnancy, when indicated, give Td or Tdap in 2nd or 3rd trimester. If not administered during pregnancy, give Tdap in immediate postpartum period.	• If never vaccinated with tetanus- and diphtheria-containing vaccine: give Td dose #1 now, dose #2 4wks later, and dose #3 6m after #2, then give booster every 10yrs. A 1-time Tdap may be substituted for any dose in the series, preferably as dose #1. • Intervals of 2yrs or less between Td and Tdap may be used.	
Polio (IPV) *Give SC or IM*	• Give to children at ages 2m, 4m, 6–18m, 4–6yrs. • May give dose #1 as early as age 6wks. • Not routinely recommended for those age 18yrs and older (except certain travelers).	• All doses should be separated by at least 4wks. • If dose #3 is given after 4th birthday, dose #4 is not needed.	**Contraindication** Previous anaphylaxis to this vaccine or to any of its components. **Precautions** • Moderate or severe acute illness. • Pregnancy.
Human papillomavirus (HPV) *Give IM*	• Give 3-dose series to girls at age 11–12yrs on a 0, 2, 6m schedule. (May be given as early as age 9yrs.) • Vaccinate all older girls and women (through age 26yrs) who were not previously vaccinated.	Minimum spacing between doses: 4wks between #1 and #2; 12 wks between #2 and #3.	**Contraindication** Previous anaphylaxis to this vaccine or to any of its components. **Precautions** • Moderate or severe acute illness. • Pregnancy.

*This document was adapted from the recommendations of the Advisory Committee on Immunization Practices (ACIP). To obtain copies of the recommendations, call the CDC-INFO Contact Center at (800) 232-4636; visit CDC's website at www.cdc.gov/vaccines/pubs/ACIP-list.htm; or visit the Immunization Action Coalition (IAC) website at www.immunize.org/acip. This table is revised periodically. Visit IAC's website at www.immunize.org/childrules to make sure you have the most current version.

Technical content reviewed by the Centers for Disease Control and Prevention, January 2008.

www.immunize.org/catg.d/p2010.pdf • Item #P2010 (1/08)

Immunization Action Coalition • 1573 Selby Avenue • Saint Paul, MN 55104 • (651) 647-9009 • www.immunize.org • www.vaccineinformation.org • admin@immunize.org

Summary of Recommendations for Childhood and Adolescent Immunization

Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccine administration and related issues	Contraindications and precautions (mild illness is not a contraindication)
Varicella (Var) (Chickenpox) *Give SC*	• Give dose #1 at age 12–15m. • Give dose #2 at age 4–6yrs. Dose #2 may be given earlier if at least 3m since dose #1. • Give a routine second dose to all older children and adolescents with history of only 1 dose. • MMRV may be used in children age 12m through 12yrs.	• If younger than age 13yrs, space dose #1 and #2 at least 3m apart. If age 13yrs or older, space at least 4wks apart. • May use as postexposure prophylaxis if given within 5d. • If Var and either MMR, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart.	**Contraindications** • Previous anaphylaxis to this vaccine or to any of its components. • Pregnancy or possibility of pregnancy within 4wks. • Children immunocompromised because of high doses of systemic steroids, cancer, leukemia, lymphoma, or immunodeficiency not related to HIV. **Precautions** • Moderate or severe acute illness. • If blood, plasma, and/or immune globulin (IG or VZIG) were given in past 11m, see ACIP statement *General Recommendations on Immunization** regarding time to wait before vaccinating. **Note:** For patients with humoral immunodeficiency, HIV infection, or leukemia, or for patients on high doses of systemic steroids, see ACIP recommendations*.
MMR (Measles, mumps, rubella) *Give SC*	• Give dose #1 at age 12–15m. • Give dose #2 at age 4–6yrs. Dose #2 may be given earlier if at least 4wks since dose #1. • If a dose was given before age 12m, it doesn't count as the first dose, so give #1 at age 12–15m with a minimum interval of 4wks between the invalid dose and dose #1. • MMRV may be used in children age 12m through 12yrs.	• If MMR and either Var, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart. • When using MMR for both doses, minimum interval is 4wks. • When using MMRV for both doses, minimum interval is 3m.	**Contraindications** • Previous anaphylaxis to this vaccine or to any of its components. • Pregnancy or possibility of pregnancy within 4wks. • Severe immunodeficiency (e.g., hematologic and solid tumors; congenital immunodeficiency; long-term immunosuppressive therapy, or severely symptomatic HIV). **Precautions** • Moderate or severe acute illness. • If blood, plasma, or immune globulin given in past 11m or if on high-dose immunosuppressive therapy, see ACIP statement *General Recommendations on Immunization** regarding time to wait before vaccinating. • History of thrombocytopenia or thrombocytopenic purpura. **Note:** MMR is not contraindicated if a PPD (tuberculosis skin test) was recently applied. If PPD and MMR not given on same day, delay PPD for 4–6wks after MMR.
Influenza Trivalent inactivated influenza vaccine (TIV) *Give IM* Live attenuated influenza vaccine (LAIV) *Give intranasally*	• Vaccinate all persons age 6m or older, including school-aged children, wanting to reduce their risk of becoming ill with influenza or of spreading it to others. • Vaccinate all children age 6–59m, as well as all siblings and household contacts of children age 0–59m. • Vaccinate persons age 5yrs and older who - have a risk factor (e.g., pregnancy, heart disease, lung disease, diabetes, renal dysfunction, hemoglobinopathy, immunosuppression, on long-term aspirin therapy, or have a condition that compromises respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration) or live in a chronic-care facility. - live or work with at-risk people as listed above. • LAIV may be given to healthy, non-pregnant persons age 2–49yrs. • Give 2 doses to first-time vaccinees age 6m through 8yrs, spaced 4wks apart. • For TIV, give 0.25 mL dose to children age 6–35m and 0.5 mL dose if age 3yrs and older.		**Contraindications** • Previous anaphylaxis to this vaccine, to any of its components, or to eggs. • For LAIV only: Pregnancy, asthma, reactive airway disease, or other chronic disorder of the pulmonary or cardiovascular systems; an underlying medical condition, including metabolic diseases such as diabetes, renal dysfunction, and hemoglobinopathies; a known or suspected immune deficiency disease or receiving immunosuppressive therapy. **Precautions** • Moderate or severe acute illness. • History of Guillain-Barré syndrome within 6wks of a previous influenza vaccination.
Rotavirus (Rota) *Give orally*	• Give a 3-dose series at age 2m, 4m, 6m. • May give dose #1 as early as age 6wks. • Give dose #3 no later than age 32wks.	• Do not begin series in infants older than age 12wks. • Dose #2 and #3 may be given 4wks after previous dose.	**Contraindication** Previous anaphylaxis to this vaccine or to any of its components. **Precautions** • Moderate or severe acute illness. • Altered immunocompetence. • Moderate to severe acute gastroenteritis or chronic gastrointestinal disease. • History of intussusception.

Summary of Recommendations for Childhood and Adolescent Immunization

Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccination and related issues	Contraindications and precautions (mild illness is not a contraindication)
Hib (*Haemophilus influenzae* type b) *Give IM*	• ActHib (PRP-T): give at age 2m, 4m, 6m, 12–15m (booster dose). • PedvaxHIB or Comvax (containing PRP-OMP): give at age 2m, 4m, 12–15m. • Dose #1 of Hib vaccine may be given no earlier than age 6wks. • The last dose (booster dose) is given no earlier than age 12m and a minimum of 8wks after the previous dose. • Hib vaccines are interchangeable; however, if different brands of Hib vaccines are administered for dose #1 and dose #2, a total of 3 doses are necessary to complete the primary series in infants. • Any Hib vaccine may be used for the booster dose. • Hib is not routinely given to children age 5yrs and older.	**All Hib vaccines:** • If #1 was given at 12–14m, give booster in 8wks. • Give only 1 dose to unvaccinated children from age 15m to 5yrs. **ActHib:** • #2 and #3 may be given 4wks after previous dose. • If #1 was given at age 7–11m, only 3 doses are needed; #2 is given 4–8wks after #1, then boost at age 12–15m (wait at least 8wks after dose #2). **PedvaxHIB and Comvax:** • #2 may be given 4wks after dose #1.	**Contraindication** Previous anaphylaxis to this vaccine or to any of its components. **Precaution** Moderate or severe acute illness.
Pneumo. conjugate (PCV) *Give IM*	• Give at ages 2m, 4m, 6m, 12–15m. • Dose #1 may be given as early as age 6wks. • Give 1 dose to unvaccinated healthy children age 24–59m. • Give 2 doses at least 8wks apart to unvaccinated high-risk** children age 24–59m. • PCV is not routinely given to children age 5yrs and older. ****High-risk:** Those with sickle cell disease; anatomic/functional asplenia; chronic cardiac, pulmonary, or renal disease; diabetes; cerebrospinal fluid leaks; HIV infection; immunosuppression; or who have or will have a cochlear implant.	• For age 7–11m: If history of 0–2 doses, give additional doses 4wks apart with no more than 3 total doses by age 12m; then give booster 8wks later. • For age 12–23m: If 0–1 dose before age 12m, give 2 doses at least 8wks apart. If 2–3 doses before age 12m, give 1 dose at least 8wks after previous dose. • For age 24–59m: If patient has had no previous doses, or has a history of 1–3 doses given before age 12m but no booster dose, or has a history of only 1 dose given at age 12–23m, give 1 dose now.	**Contraindication** Previous anaphylaxis to this vaccine or to any of its components. **Precaution** Moderate or severe acute illness.
Pneumo. polysacch. (PPV) *Give IM or SC*	• Give 1 dose at least 8wks after final dose of PCV to high-risk children age 2yrs and older. • For children who are immunocompromised or have sickle cell disease or functional or anatomic asplenia, give a 2nd dose of PPV 3–5yrs after previous PPV (consult ACIP PPV recommendations [*MMWR* 1997;46 [RR-8] for details*).		**Contraindication** Previous anaphylaxis to this vaccine or to any of its components. **Precaution** Moderate or severe acute illness.
Hepatitis A *Give IM*	• Give 2 doses to all children at age 1yr (12–23m) spaced 6m apart. • Vaccinate all children and adolescents age 2 years and older who - Live in a state, county, or community with a routine vaccination program already in place for children age 2yrs and older. - Travel anywhere except U.S., W. Europe, N. Zealand, Australia, Canada, or Japan. - Wish to be protected from HAV infection. - Have chronic liver disease, clotting factor disorder, or are MSM adolescents.	• Minimum interval between doses is 6m. • Consider routine vaccination of children age 2yrs and older in areas with no existing program.	**Contraindication** Previous anaphylaxis to this vaccine or to any of its components. **Precaution** Moderate or severe acute illness.
Meningococcal conjugate (MCV4) *Give IM* — **polysaccharide** (MPSV) *Give SC*	• Give 1-time dose of MCV4 to adolescents age 11 through 18yrs. • Vaccinate all college freshmen living in dorms who have not been vaccinated. • Vaccinate all children age 2yrs and older who have any of the following risk factors (MCV4 is preferable to MPSV): - Anatomic or functional asplenia, or terminal complement component deficiencies. - Travel to, or reside in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the "meningitis belt" of Sub-Saharan Africa).	If previously vaccinated with MPSV and risk continues, give MCV4 5yrs after MPSV.	**Contraindication** Previous anaphylaxis to this vaccine or to any of its components, including diphtheria toxoid (for MCV4). **Precautions** • Moderate or severe acute illness. • For MCV4 only: history of Guillain-Barré syndrome (GBS).

Summary of Recommendations for Adult Immunization

Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
Influenza Trivalent inactivated influenza vaccine (TIV) *Give IM*	• All persons wanting to reduce the likelihood of becoming ill with influenza or of spreading it to others. • Persons age 50yrs and older. • Persons with medical problems (e.g., heart disease, lung disease, diabetes, renal dysfunction, hemoglobinopathy, immunosuppression). • Persons with any condition that compromises respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration (e.g., cognitive dysfunction, spinal cord injury, seizure disorder, or other neuromuscular disorder). • Persons living in chronic care facilities. • Persons working or living with at-risk people. • Women who will be pregnant during the influenza season (December–March). • All healthcare personnel and other persons who provide direct care to at-risk people. • Household contacts and out-of-home caregivers of children age 0–59m. • Travelers at risk for complications of influenza who go to areas where influenza activity exists or who may be among people from areas of the world where there is current influenza activity (e.g., on organized tours). • Students or other persons in institutional settings (e.g., dormitory residents).	• Give 1 dose every year in the fall or winter. • Vaccine should be given as soon as it is available and should continue until the supply is depleted. • Continue to give vaccine to unvaccinated adults throughout the influenza season (including when influenza activity is present in the community) and at other times when the risk of influenza exists.	**Contraindication** Previous anaphylactic reaction to this vaccine, to any of its components, or to eggs. **Precautions** • Moderate or severe acute illness. • History of Guillain-Barré syndrome (GBS) within 6wks of previous TIV.
Influenza Live attenuated influenza vaccine (LAIV) *Give intranasally*	• All healthy, non-pregnant persons age 49yrs and younger who want to reduce the likelihood of becoming ill with influenza or of spreading it to others or who meet any of the criteria listed below. - Working or living with at-risk people as listed in the section above. - Healthcare personnel or other persons who provide direct care to at-risk people (except persons in close contact with severely immunosuppressed persons). - Household contacts and out-of-home caregivers of children age 0–59m. - Travelers who may be among people from areas of the world where there is current influenza activity (e.g., on organized tours). - Students or other persons in institutional settings (e.g., dormitory residents).		**Contraindications** • Previous anaphylactic reaction to this vaccine, to any of its components, or to eggs. • Pregnancy, asthma, reactive airway disease or other chronic disorder of the pulmonary or cardiovascular system; an underlying medical condition, including metabolic disease such as diabetes, renal dysfunction, and hemoglobinopathy; a known or suspected immune deficiency disease or current receipt of immunosuppressive therapy. **Precautions** • Moderate or severe acute illness. • History of GBS within 6wks of a previous influenza vaccination.
Pneumococcal poly-saccharide (PPV) *Give IM or SC*	• Persons age 65yrs and older. • Persons who have chronic illness or other risk factors, including chronic cardiac or pulmonary disease, chronic liver disease, alcoholism, diabetes, CSF leak, as well as people living in special environments or social settings (including Alaska Natives and certain American Indian populations). Those at highest risk of fatal pneumococcal infection are persons with anatomic asplenia, functional asplenia, or sickle cell disease; immunocom-promised persons including those with HIV infection, leukemia, lymphoma, Hodgkin's disease, multiple myeloma, generalized malignancy, chronic renal failure, or nephrotic syndrome; persons receiving immunosuppressive chemotherapy (including corticosteroids); those who received an organ or bone marrow transplant; and candidates for or recipients of cochlear implants.	• Routinely given as a 1-time dose; administer if previous vaccination history is unknown. • One-time revaccination is recommended 5yrs later for persons at highest risk of fatal pneumococcal infection or rapid antibody loss (e.g., renal disease) and for persons age 65yrs and older if the 1st dose was given prior to age 65yrs and 5yrs or more have elapsed since the previous dose.	**Contraindication** Previous anaphylactic reaction to this vaccine or to any of its components. **Precaution** Moderate or severe acute illness.

* This document was adapted from the recommendations of the Advisory Committee on Immunization Practices (ACIP). To obtain copies of these recommendations, call the CDC-INFO Contact Center at (800) 232-4636; visit CDC's website at www.cdc.gov/vaccines/pubs/ACIP-list.htm; or visit the Immunization Action Coalition (IAC) website at www.immunize.org/acip. This table is revised periodically. Visit IAC's website at www.immunize.org/adultrules to make sure you have the most current version.

Technical content reviewed by the Centers for Disease Control and Prevention, January 2008.

www.immunize.org/catg.d/p2011.pdf • Item #P2011 (1/08)

Immunization Action Coalition • 1573 Selby Avenue • Saint Paul, MN 55104 • (651) 647-9009 • www.immunize.org • www.vaccineinformation.org • admin@immunize.org

Summary of Recommendations for Adult Immunization (continued)

Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
Hepatitis B (HepB) *Give IM* Brands may be used interchangeably.	• All persons through age 18yrs. • All adults wishing to obtain immunity against hepatitis B virus infection. • High-risk persons, including household contacts and sex partners of HBsAg-positive persons; injecting drug users; sexually active persons not in a long-term, mutually monogamous relationship; men who have sex with men; persons with HIV or a recently diagnosed STD; patients receiving hemodialysis and patients with renal disease that may result in dialysis; healthcare personnel and public safety workers who are exposed to blood; clients and staff of institutions for the developmentally disabled; inmates of long-term correctional facilities; and certain international travelers. • Persons with chronic liver disease. **Note:** Provide serologic screening for immigrants from endemic areas. If patient is chronically infected, assure appropriate disease management. Screen sex partners and household members; give HepB at the same visit if not already vaccinated.	• Three doses are needed on a 0, 1, 6m schedule. • Alternative timing options for vaccination include 0, 2, 4m and 0, 1, 4m. • There must be 4wks between doses #1 and #2, and 8wks between doses #2 and #3. Overall, there must be at least 16wks between doses #1 and #3. • **Schedule for those who have fallen behind:** If the series is delayed between doses, DO NOT start the series over. Continue from where you left off.	**Contraindication** Previous anaphylactic reaction to this vaccine or to any of its components. **Precaution** Moderate or severe acute illness.
Hepatitis A (HepA) *Give IM* Brands may be used interchangeably.	• All persons wishing to obtain immunity to hepatitis A virus infection. • Persons who travel or work anywhere EXCEPT the U.S., Western Europe, New Zealand, Australia, Canada, and Japan. • Persons with chronic liver disease, including persons with hepatitis B and C; injecting and non-injecting drug users; men who have sex with men; people with clotting-factor disorders; persons who work with hepatitis A virus in experimental lab settings (not routine medical laboratories); and food handlers when health authorities or private employers determine vaccination to be appropriate. **Note:** Prevaccination testing is likely to be cost effective for persons older than age 40yrs, as well as for younger persons in certain groups with a high prevalence of hepatitis A virus infection.	For Twinrix® (hepatitis A and B combination vaccine [GSK]) for patients age 18yrs and older only: 3 doses are needed on a 0, 1, 6m schedule. An alternative schedule can also be used at 0, 7, 21–30d, and a booster at 12m. • Two doses are needed. • The minimum interval between doses #1 and #2 is 6m. • If dose #2 is delayed, do not repeat dose #1. Just give dose #2.	**Contraindication** Previous anaphylactic reaction to this vaccine or to any of its components. **Precautions** • Moderate or severe acute illness. • Safety during pregnancy has not been determined, so benefits must be weighed against potential risk.
Td, Tdap (Tetanus, diphtheria, pertussis) *Give IM*	• All adults who lack written documentation of a primary series consisting of at least 3 doses of tetanus- and diphtheria-toxoid-containing vaccine. • A booster dose of tetanus- and diphtheria-toxoid-containing vaccine may be needed for wound management as early as 5yrs after receiving a previous dose, so consult ACIP recommendations.* • Using tetanus toxoid (TT) instead of Td or Tdap is <u>not</u> recommended. • In pregnancy, when indicated, give Td or Tdap in 2nd or 3rd trimester. If not administered during pregnancy, give Tdap in immediate postpartum period. **For Tdap only:** • All adults younger than age 65yrs who have not already received Tdap. • Healthcare personnel who work in hospitals or ambulatory care settings and have direct patient contact and who have not received Tdap. • Adults in contact with infants younger than age 12m (e.g., parents, grandparents younger than age 65yrs, childcare providers, healthcare personnel) who have not received a dose of Tdap should be prioritized for vaccination.	• For persons who are unvaccinated or behind, complete the primary series with Td (spaced at 0, 1–2m, 6–12m intervals). One-time dose of Tdap may be used for any dose if age 18–64yrs. • Give Td booster every 10yrs after the primary series has been completed. For adults age 18–64yrs, a 1-time dose of Tdap is recommended to replace the next Td. • Intervals of 2yrs or less between Td and Tdap may be used. **Note:** The two Tdap products are licensed for different age groups: Adacel™ (sanofi) for use in persons age 11–64yrs and Boostrix® (GSK) for use in persons age 10–18yrs.	**Contraindications** • Previous anaphylactic reaction to this vaccine or to any of its components. • For Tdap only, history of encephalopathy within 7d following DTP/DTaP. **Precautions** • Moderate or severe acute illness. • GBS within 6wks of receiving a previous dose of tetanus-toxoid-containing vaccine. • Unstable neurologic condition. • History of arthus reaction following a previous dose of tetanus- and/or diphtheria-toxoid-containing vaccine, including MCV4. **Note:** Use of Td/Tdap is not contraindicated in pregnancy. Either vaccine may be given during trimester #2 or #3 at the provider's discretion.
Polio (IPV) *Give IM or SC*	Not routinely recommended for persons age 18yrs and older. **Note:** Adults living in the U.S. who never received or completed a primary series of polio vaccine need not be vaccinated unless they intend to travel to areas where exposure to wild-type virus is likely (i.e., India, Pakistan, Afghanistan, and Nigeria). Previously vaccinated adults can receive one booster dose if traveling to polio endemic areas.	• Refer to ACIP recommendations* regarding unique situations, schedules, and dosing information.	**Contraindication** Previous anaphylactic or neurologic reaction to this vaccine or to any of its components. **Precautions** • Moderate or severe acute illness. • Pregnancy.

Summary of Recommendations for Adult Immunization (continued)

Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
Varicella (Var) (Chickenpox) *Give SC*	• All adults without evidence of immunity. **Note:** Evidence of immunity is defined as written documentation of 2 doses of varicella vaccine; born in the U.S. before 1980 (exception: healthcare personnel and pregnant women); a history of varicella disease or herpes zoster based on healthcare provider diagnosis; laboratory evidence of immunity; and/or laboratory confirmation of disease.	• Two doses are needed. • Dose #2 is given 4–8wks after dose #1. • If Var and either MMR, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart. • If the second dose is delayed, do not repeat dose #1. Just give dose #2.	**Contraindications** • Previous anaphylactic reaction to this vaccine or to any of its components. • Pregnancy or possibility of pregnancy within 4wks. • Persons immunocompromised because of malignancy and primary or acquired cellular immunodeficiency, including HIV/AIDS (although vaccination may be considered if CD4+ T-lymphocyte counts are greater than or equal to 200 cells/µL. See *MMWR* 2007;56,RR-4). **Precautions** • If blood, plasma, and/or immune globulin (IG or VZIG) were given in past 11m, see ACIP statement *General Recommendations on Immunization** regarding time to wait before vaccinating. • Moderate or severe acute illness. **Note:** For those on high-dose immunosuppressive therapy, consult ACIP recommendations regarding delay time.*
Meningococcal Conjugate vaccine (MCV4) *Give IM* Polysaccharide vaccine (MPSV4) *Give SC*	• All persons age 11 through 18yrs. • College freshmen living in dormitories. • Persons with anatomic or functional asplenia or with terminal complement component deficiencies. • Persons who travel to or reside in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the "meningitis belt" of Sub-Saharan Africa). • Microbiologists routinely exposed to isolates of *N. meningitidis.*	• One dose is needed. • If previous vaccine was MPSV4, revaccinate after 5yrs if risk continues. • Revaccination after MCV4 is not recommended. • MCV4 is preferred over MPSV4 for persons age 55yrs and younger, although MPSV4 is an acceptable alternative.	**Contraindication** Previous anaphylactic or neurologic reaction to this vaccine or to any of its components, including diphtheria toxoid (for MCV4). **Precautions** • Moderate or severe acute illness. • For MCV4 only, history of Guillain-Barré syndrome (GBS).
MMR (Measles, mumps, rubella) *Give SC*	• Persons born in 1957 or later (especially those born outside the U.S.) should receive at least 1 dose of MMR if there is no serologic proof of immunity or documentation of a dose given on or after the first birthday. • Persons in high-risk groups, such as healthcare personnel, students entering college and other post–high school educational institutions, and international travelers, should receive a total of 2 doses. • Persons born before 1957 are usually considered immune, but proof of immunity (serology or vaccination) may be desirable for healthcare personnel. • Women of childbearing age who do not have acceptable evidence of rubella immunity or vaccination.	• One or 2 doses are needed. • If dose #2 is recommended, give it no sooner than 4wks after dose #1. • If MMR and either Var, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart. • If a pregnant woman is found to be rubella susceptible, administer MMR postpartum.	**Contraindications** • Previous anaphylactic reaction to this vaccine or to any of its components. • Pregnancy or possibility of pregnancy within 4wks. • Persons immunocompromised because of cancer, leukemia, lymphoma, immunosuppressive drug therapy, including high-dose steroids or radiation therapy. **Note:** HIV positivity is NOT a contraindication to MMR except for those who are severely immunocompromised (i.e., CD4+ T-lymphocyte counts are less than 200 cells/µL). **Precautions** • If blood, plasma, and/or immune globulin were given in past 11m, see ACIP statement *General Recommendations on Immunization** regarding time to wait before vaccinating. • Moderate or severe acute illness. • History of thrombocytopenia or thrombocytopenic purpura. **Note:** If PPD (tuberculosis skin test) and MMR are both needed but not given on same day, delay PPD for 4–6wks after MMR.
Human papillomavirus (HPV) *Give IM*	All previously unvaccinated women through age 26yrs.	• Three doses are needed on a 0, 2, 6m schedule. • The minimum interval between doses #1 and #2 is 4wks, and between #2 and #3 is 12wks.	**Contraindication** Previous anaphylactic reaction to this vaccine or to any of its components. **Precaution** Data on vaccination in pregnancy are limited. Vaccination should be delayed until after completion of the pregnancy.
Zoster (shingles) (Zos) *Give SC*	ACIP has voted to recommend herpes zoster (shingles) vaccine for all persons age 60yrs and older who do not have contraindications. Provisional recommendations are online at www.cdc.gov/vaccines/recs/provisional/default.htm#acip.		

Suggested intervals between administration of **immune globulin preparations** and **measles-** or **varicella-containing vaccine**

Product / Indication	Dose, including mg immunoglobulin G (IgG)/kg body weight	Recommended interval before measles or varicella-containing vaccine administration
RSV monoclonal antibody (Synagis™)[1]	15 mg/kg intramuscularly (IM)	None
Tetanus IG (TIG)	250 units (10 mg IgG/kg) IM	3 months
Hepatitis A IG		
Contact prophylaxis	0.02 mL/kg (3.3.mg IgG/kg) IM	3 months
International travel	0.06 mL/kg (10 mg IgG/kg) IM	3 months
Hepatitis B IG (HBIG)	0.06 mL/kg (10 mg IgG/kg) IM	3 months
Rabies IG (RIG)	20 IU/kg (22 mg IgG/kg) IM	4 months
Measles prophylaxis IG		
Standard (i.e., nonimmunocompromised) contact	0.25 mL/kg (40 mg IgG/kg) IM	5 months
Immunocompromised contact	0.50 mL/kg (80 mg IgG/kg) IM	6 months
Blood tranfusion		
Red blood cells (RBCs), washed	10 mL/kg negligible IgG/kg intravenously (IV)	None
RBCs, adenine-saline added	10 mL/kg (10 mg IgG/kg) IV	3 months
Packed RBCs (Hct 65%)[2]	10 mL/kg (60 mg IgG/kg) IV	6 months
Whole blood (Hct 35%-50%)[2]	10 mL/kg (80-100 mg IgG/kg) IV	6 months
Plasma/platelet products	10 mL/kg (160 mg IgG/kg) IV	7 months
Cytomegalovirus intravenous immune globulin (IGIV)	150 mg/kg maximum	6 months
IGIV		
Replacement therapy for immune deficiencies[3]	300-400 mg/kg IV[3]	8 months
Immune thrombocytopenic purpura	400 mg/kg IV	8 months
Immune thrombocytopenic purpura	1000 mg/kg IV	10 months
Postexposure varicella prophylaxis[4]	400 mg/kg IV	8 months
Kawasaki disease	2 g/kg IV	11 months

This table is not intended for determining the correct indications and dosages for using antibody-containing products. Unvaccinated persons might not be fully protected against measles during the entire recommended interval, and additional doses of immune globulin or measles vaccine might be indicated after measles exposure. Concentrations of measles antibody in an immune globulin preparation can vary by manufacturer's lot. Rates of antibody clearance after receipt of an immune globulin preparation also might vary. Recommended intervals are extrapolated from an estimated half-life of 30 days for passively acquired antibody and an observed interference with the immune response to measles vaccine for 5 months after a dose of 80 mg IgG/kg.

1 Contains antibody only to respiratory syncytial virus.

2 Assumes a serum IgG concentration of 16 mg/mL.

3 Measles and varicella vaccinations are recommended for children with asymptomatic or mildly symptomatic human immunodeficiency virus (HIV) infection but are contraindicated for persons with severe immunosuppression from HIV or any other immunosuppressive disorder.

4 The investigational product VariZIG, similar to licensed VZIG, is a purified human immune globulin preparation made from plasma containing high levels of anti-varicella antibodies (immunoglobulin class G [IgG]). When indicated, health-care providers should make every effort to obtain and administer VariZIG. **Varicella vaccination should be delayed until 5 months after VariZIG administration.** In situations in which administration of VariZIG does not appear possible within 96 hours of exposure, administration of immune globulin intravenous (IGIV) should be considered as an alternative. IGIV also should be administered within 96 hours of exposure. Although licensed IGIV preparations are known to contain anti-varicella antibody titers, the titer of any specific lot of IGIV that might be available is uncertain because IGIV is not routinely tested for antivaricella antibodies. The recommended IGIV dose for postexposure prophylaxis of varicella is 400 mg/kg, administered once. For a pregnant woman who cannot receive VariZIG within 96 hours of exposure, clinicians can choose either to administer IGIV or closely monitor the woman for signs and symptoms of varicella and institute treatment with acyclovir if illness occurs. (CDC. A new product for postexposure prophylaxis available under an investigational new drug application expanded access protocol. *MMWR* 2006;55:209-10.)

Healthcare Personnel Vaccination Recommendations

Vaccine	Recommendations in brief
Hepatitis B	Give 3-dose series (dose #1 now, #2 in 1 month, #3 approximately 5 months after #2). Give IM. Obtain anti-HBs serologic testing 1–2 months after dose #3.
Influenza	Give 1 dose of TIV or LAIV annually. Give TIV intramuscularly or LAIV intranasally.
MMR	For healthcare personnel (HCP) born in 1957 or later without serologic evidence of immunity or prior vaccination, give 2 doses of MMR, 4 weeks apart. For HCP born prior to 1957, see below. Give SC.
Varicella (chickenpox)	For HCP who have no serologic proof of immunity, prior vaccination, or history of varicella disease, give 2 doses of varicella vaccine, 4 weeks apart. Give SC.
Tetanus, diphtheria, pertussis	Give all HCP a Td booster dose every 10 years, following the completion of the primary 3-dose series. Give a 1-time dose of Tdap to all HCP younger than age 65 years with direct patient contact. Give IM.
Meningococcal	Give 1 dose to microbiologists who are routinely exposed to isolates of *N. meningitidis.*

Hepatitis A, typhoid, and polio vaccines are not routinely recommended for HCP who may have on-the-job exposure to fecal material.

Hepatitis B

Healthcare personnel (HCP) who perform tasks that may involve exposure to blood or body fluids should receive a 3-dose series of hepatitis B vaccine at 0-, 1-, and 6-month intervals. Test for hepatitis B surface antibody (anti-HBs) to document immunity 1–2 months after dose #3.

- If anti-HBs is at least 10 mIU/mL (positive), the patient is immune. No further serologic testing or vaccination is recommended.
- If anti-HBs is less than 10 mIU/mL (negative), the patient is unprotected from hepatitis B virus (HBV) infection; revaccinate with a 3-dose series. Retest anti-HBs 1–2 months after dose #3.
  - If anti-HBs is positive, the patient is immune. No further testing or vaccination is recommended.
  - If anti-HBs is negative following 6 doses of vaccine, the patient is a non-responder.

For non-responders: HCP who are non-responders should be considered susceptible to HBV and should be counseled regarding precautions to prevent HBV infection and the need to obtain HBIG prophylaxis for any known or probable parenteral exposure to hepatitis B surface antigen (HBsAg)-positive blood.[1] It is also possible that non-responders are persons who are HBsAg positive. Testing should be considered. HCP found to be HBsAg positive should be counseled and medically evaluated.

Note: Anti-HBs testing is not recommended routinely for previously vaccinated HCP who were not tested 1–2 months after their original vaccine series. These HCP should be tested for anti-HBs when they have an exposure to blood or body fluids. If found to be anti-HBs negative, the HCP should be treated as if susceptible.[1]

Influenza

Trivalent (Inactivated) Influenza Vaccine (TIV): May give to any HCP.
Live, Attenuated Influenza Vaccine (LAIV): May give to any non-pregnant healthy HCP age 49 years and younger.

1. All HCP should receive annual influenza vaccine. Groups that should be targeted include all personnel (including volunteers) in hospitals, outpatient, and home-health settings who have any patient contact.
2. TIV is preferred over LAIV for HCP who are in close contact with severely immunosuppressed persons (e.g., stem cell transplant patients) when patients require a protective environment.

Measles, Mumps, Rubella (MMR)

HCP who work in medical facilities should be immune to measles, mumps, and rubella.

- HCP born in 1957 or later can be considered immune to measles, mumps, or rubella only if they have documentation of (a) physician-diagnosed measles or mumps disease; or (b) laboratory evidence of measles, mumps, or rubella immunity (HCP who have an "indeterminate" or "equivocal" level of immunity upon testing should be considered nonimmune); or (c) appropriate vaccination against measles, mumps, and rubella (i.e., administration on or after the first birthday of two doses of live measles and mumps vaccines separated by 28 days or more, and at least one dose of live rubella vaccine).
- Although birth before 1957 generally is considered acceptable evidence of measles, mumps, and rubella immunity, healthcare facilities should consider recommending a dose of MMR vaccine (two doses during a mumps outbreak) to unvaccinated HCP born before 1957 who are in either of the following categories: (a) do not have a history of physician-diagnosed measles and mumps disease or laboratory evidence of measles and mumps immunity and (b) do not have laboratory evidence of rubella immunity.

Varicella

It is recommended that all HCP be immune to varicella. Evidence of immunity in HCP includes documentation of 2 doses of varicella vaccine given at least 28 days apart, history of varicella or herpes zoster based on physician diagnosis, laboratory evidence of immunity, or laboratory confirmation of disease.

Tetanus/Diphtheria/Pertussis (Td/Tdap)

All adults who have completed a primary series of a tetanus/diphtheria-containing product (DTP, DTaP, DT, Td) should receive Td boosters every 10 years. As soon as feasible, HCP younger than age 65 years with direct patient contact should be given a 1-time dose of Tdap, with priority given to those having contact with infants younger than age 12 months.

Meningococcal

Vaccination is recommended for microbiologists who are routinely exposed to isolates of *N. meningitidis.* Use of MCV4 is preferred among persons ages 11–55 years; give IM. If MCV4 is unavailable, MPSV is an acceptable alternative for HCP ages 11–55 years. Use of MPSV is recommended for HCP older than age 55; give SC.

References

1. See Table 3 in "Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis," *MMWR*, June 29, 2001, Vol. 50, RR-11.

For additional specific ACIP recommendations, refer to the official ACIP statements published in *MMWR*. To obtain copies, visit CDC's website at www.cdc.gov/nip/publications/ACIP-list.htm; or visit the Immunization Action Coalition (IAC) website at www.immunize.org/acip.

Adapted with thanks from the Michigan Department of Community Health

Technical content reviewed by the Centers for Disease Control and Prevention, March 2007.

www.immunize.org/catg.d/p2017.pdf • Item #P2017 (3/07)

Immunization Action Coalition • 1573 Selby Ave. • St. Paul, MN 55104 • (651) 647-9009 • www.immunize.org • www.vaccineinformation.org

Vaccination of Persons with Primary and Secondary Immune Deficiencies

PRIMARY				
Category	**Specific Immunodeficiency**	**Contraindicated Vaccines[1]**	**Risk-Specific Recommended Vaccines[1]**	**Effectiveness & Comments**
B-lymphocyte (humoral)	Severe antibody deficiencies (e.g., X-linked agammaglobulinemia and common variable immunodeficiency)	OPV[2] Smallpox LAIV BCG Ty21a (live oral typhoid)	Pneumococcal Influenza (TIV) Consider measles and varicella vaccination.	The effectiveness of any vaccine will be uncertain if it depends only on the humoral response; IGIV interferes with the immune response to measles vaccine and possibly varicella vaccine.
	Less severe antibody deficiencies (e.g., selective IgA deficiency and IgG subclass deficiency	OPV[2] Other live vaccines appear to be safe.	Pneumococcal Influenza (TIV)	All vaccines probably effective. Immune response may be attenuated.
T-lymphocyte (cell-mediated and humoral)	Complete defects (e.g., severe combined immunodeficiency [SCID] disease, complete DiGeorge syndrome)	All live vaccines [3,4]	Pneumococcal Influenza (TIV)	Vaccines may be ineffective.
	Partial defects (e.g., most patients with DiGeorge syndrome, Wiskott-Aldrich syndrome, ataxia-telangiectasia)	All live vaccines [3,4]	Pneumococcal Meningococcal Hib (if not administered in infancy) Influenza (TIV)	Effectiveness of any vaccine depends on degree of immune suppression.
Complement	Deficiency of early components (C1-C4), late components (C5-C9), properdin, factor B.	None	Pneumococcal Meningococcal Influenza (TIV)	All routine vaccines probably effective.
Phagocytic function	Chronic granulomatous disease, leukocyte adhesion defects, and myeloperoxidase deficiency.	Live bacterial vaccines[3]	Pneumococcal[5] Influenza (TIV) (to decrease secondary bacterial infection).	All inactivated vaccines safe and probably effective. Live viral vaccines probably safe and effective.

[1] Other vaccines that are not specifically contraindicated may be used if otherwise indicated.
[2] OPV is no longer available for routine use in the United States.
[3] Live bacterial vaccines: BCG, and Ty21a *Salmonella typhi* vaccine.
[4] Live viral vaccines: MMR, OPV, LAIV, yellow fever, varicella (including MMRV and HZ vaccine), and vaccinia (smallpox). Smallpox vaccine is not recommended for children or the general public.
[5] Pneumococcal vaccine is not indicated for children with chronic granulomatous disease.

Vaccination of Persons with Primary and Secondary Immune Deficiencies

SECONDARY			
Specific Immunodeficiency	**Contraindicated Vaccines[1]**	**Recommended Vaccines[1]**	**Effectiveness & Comments**
HIV/AIDS	OPV[2] Smallpox BCG LAIV Withhold MMR and varicella in severely immunocompromised persons.	Influenza (TIV) Pneumococcal Consider Hib (if not administered in infancy) and Meningococcal vaccination.	MMR, varicella, and all inactivated vaccines, including inactivated influenza, might be effective.[3]
Malignant neoplasm, transplantation, immunosuppressive or radiation therapy	Live viral and bacterial, depending on immune status.[4,5]	Influenza (TIV) Pneumococcal	Effectiveness of any vaccine depends on degree of immune suppression.
Asplenia	None	Pneumococcal Meningococcal Hib (if not administered in infancy)	All routine vaccines probably effective.
Chronic renal disease	LAIV	Pneumococcal Influenza (TIV) Hepatitis B	All routine vaccines probably effective.

[1] Other vaccines that are not specifically contraindicated may be used if otherwise indicated.
[2] OPV is no longer available for routine use in the United States.
[3] HIV-infected children should receive IG after exposure to measles, and may receive varicella and measles vaccine if CD4+ lymphocyte count is ≥15%.
[4] Live viral vaccines: MMR, OPV, LAIV, yellow fever, varicella (including MMRV and HZ vaccine), and vaccinia (smallpox). Smallpox vaccine is not recommended for children or the general public.
[5] Live bacterial vaccines: BCG, and Ty21a *Salmonella typhi* vaccine.

AIDS: Acquired Immunodeficiency Syndrome
BCG: Bacilli Calmette-Guerin vaccine
Hib: *Haemophilus influenzae* type b vaccine
HIV: Human Immunodeficiency Virus
IGIV: Immune Globulin Intravenous
IG: Immunoglobulin
LAIV: Live, Attenuated Influenza Vaccine
MMR: Measles, Mumps, Rubella vaccine
OPV: Oral Poliovirus Vaccine (live)
TIV: Trivalent (inactivated) Influenza Vaccine

Modified from American Academy of Pediatrics. Passive Immunization. In: Pickering LK, Baker C, Long S, McMillen J, ed. *Red Book: 2006 Report of the Committee on Infectious Diseases*. 27th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006: [71-72] and CDC. General Recommendations on Immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2006: 55 (No. RR-15).

Appendix A