

# Recommended Adult Immunization Schedule: United States, 2011\*

Advisory Committee on Immunization Practices†

The Advisory Committee on Immunization Practices (ACIP) annually reviews the recommended Adult Immunization Schedule (Figure) to ensure that the schedule reflects current recommendations for the licensed vaccines. In October 2010, ACIP approved the Adult Immunization Schedule for 2011, which includes several changes. The notation for seasonal influenza vaccine in the figure and footnotes was changed to reflect the expanded recommendation for annual influenza vaccination for everyone 6 months of age or older, which was approved by ACIP in February 2010. In October 2010, ACIP issued a permissive recommendation for use of the tetanus, diphtheria, pertussis (Tdap) vaccine in adults aged 65 years or older; approved the recommendation that Tdap can be administered regardless of how much time has elapsed since the last tetanus and diphtheria (Td)-containing vaccine; and approved a recommendation for a 2-dose series of meningococcal vaccine in adults with certain high-risk medical conditions. The vaccines listed in the Figure have been reordered to keep all universally recommended vaccines together (for example, influenza, Td/Tdap, varicella, human papillomavirus [HPV], and zoster).

Clarifications were made to the footnotes for the measles, mumps, rubella (MMR); HPV; and *Haemophilus influenzae* type B (Hib) vaccines and for revaccination with pneumococcal polysaccharide (PPSV). A statement has been added to the box at the bottom of the footnotes to clarify that a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses.

This schedule has also been approved by the American Academy of Family Physicians, American College of Obstetricians and Gynecologists, and American College of Physicians.

## CHANGES IN THE SCHEDULE FOR 2011

The seasonal influenza footnote (footnote 1) is revised and shortened to reflect a recommendation for vaccination

of all persons 6 months of age or older, including all adults. The high-dose influenza vaccine (Fluzone, sanofi-pasteur, Swiftwater, Pennsylvania), licensed in 2010 for adults aged 65 years or older, is mentioned as an option in this age group.

The Td/Tdap vaccine footnote (footnote 2) has language added to indicate that persons aged 65 years or older who have close contact with an infant younger than 12 months should get vaccinated with the Tdap vaccine and notes that all persons aged 65 years or older may get vaccinated with the Tdap vaccine. Also added is the recommendation to administer Tdap regardless of interval since the last Td-containing vaccine.

The HPV vaccine footnote (footnote 4) has language added to the introductory sentences to indicate that either quadrivalent (HPV4) vaccine or bivalent (HPV2) vaccine is recommended for females.

The MMR vaccine footnote (footnote 6) has been revised mainly by consolidating common language that had previously been part of each of the 3 vaccine-component sections into 1 introductory statement.

The revaccination with PPSV footnote (footnote 8) clarifies that 1-time revaccination after 5 years applies only to persons with indicated chronic conditions who are aged 19 through 64 years.

The meningococcal conjugate vaccine (MCV4) footnote (footnote 9) has language added to indicate that a 2-dose series of meningococcal vaccine is recommended for adults with anatomical or functional asplenia or persistent complement component deficiencies and adults with HIV infection who are vaccinated. In addition, language has been added that a single dose of meningococcal vaccine is still recommended for those with other indications. Finally, language has been added to clarify that MCV4 is a quadrivalent vaccine.

The language for the selected conditions for the Hib vaccine footnote (footnote 12) has been shortened to clarify which high-risk persons may receive 1 dose of Hib vaccine.

The Adult Immunization Schedule is available in English and Spanish at [www.cdc.gov/vaccines/recs/schedules/adult-schedule.htm](http://www.cdc.gov/vaccines/recs/schedules/adult-schedule.htm). General information about adult vaccination is available at [www.cdc.gov/vaccines/default.htm](http://www.cdc.gov/vaccines/default.htm). The ACIP statements for specific vaccines are available at [www.cdc.gov/vaccine/pubs/acip-list.htm](http://www.cdc.gov/vaccine/pubs/acip-list.htm). Instructions for reporting adverse events to the Vaccine Adverse Event Re-

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Appendix

Conversion of graphics into slides

\* The 2011 ACIP Adult Immunization Schedule appeared simultaneously in *Annals of Internal Medicine* and *MMWR Recommendations and Reports*. Readers who wish to cite the schedule should use the following citation: Advisory Committee on Immunization Practices. Recommended adult immunization schedule: United States, 2011. *Ann Intern Med*. 2011;154:168-73.

† For a list of members of the Advisory Committee on Immunization Practices, see the Appendix (available at [www.annals.org](http://www.annals.org)).

porting System are available at [www.vaers.hhs.gov](http://www.vaers.hhs.gov) or by telephone.

From the Centers for Disease Control and Prevention, Atlanta, Georgia.

**Potential Conflicts of Interest:** To assure the integrity of the ACIP, the U.S. Department of Health and Human Services has taken steps to assure that there is technical compliance with ethics statutes and regulations regarding financial conflicts of interest. Concerns regarding the potential for the appearance of a conflict are addressed, or avoided altogether, through both pre- and postappointment considerations. Individuals with particular vaccine-related interests will not be considered for appointment to the committee. Potential nominees are screened for conflicts of interest and, if any are found, they are asked to divest or forgo certain vaccine-related activities. In addition, at the beginning of each ACIP meeting, each member is asked to declare his or her conflicts. Members with conflicts are not permitted to vote if the conflict involves the vaccine or biologic being voted upon. Members of the ACIP have disclosed the following: Dr. Chilton: *Support to travel to meetings for the study or other purposes:* Centers for Disease Control and Prevention. Dr. Coyne-Beasley: *Consultancy:* sanofi-pasteur; *Payment for lectures including service on speakers bureaus:* sanofi-pasteur. Dr. Ehresmann: *Consulting fee or honorarium (money to institution):* Centers for Disease Control and Prevention; *Support to travel to meetings for the study or other purposes*

*(money to institution):* Centers for Disease Control and Prevention. Dr. Englund: *Support to travel to meetings for the study or other purposes:* Centers for Disease Control and Prevention; *Grants/grants pending (money to institution):* Novartis, Medimmune, ADMA; *Other (money to institution):* National Institutes of Health, Bill & Melinda Gates Foundation. Dr. Keitel: *Consulting fee or honorarium:* Centers for Disease Control and Prevention; *Support to travel to meetings for the study or other purposes:* Centers for Disease Control and Prevention; *Grants/grants pending:* Exxon Mobil Research Club; *Grants/grants pending (money to institution):* Novartis, Protein Sciences; *Stock/stock options:* Pfizer (since divested), Schering-Plough (since divested). Dr. Marcy: *Consultancy:* ACIP; *Consultancy (money to institution):* ACIP; *Payment for development of educational presentations:* Medical Education Speakers' Network, National Foundation for Infectious Diseases, Rady Children's Hospital San Diego, Phoenix Children's Hospital, Symposia Medicus. Dr. Rosenbaum: *Consulting fee or honorarium:* Centers for Disease Control and Prevention; *Support to travel to meetings for the study or other purposes:* Centers for Disease Control and Prevention. Disclosures can also be viewed at [www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M10-2789](http://www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M10-2789).

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Figure. Recommended Adult Immunization Schedule: United States, 2011.

## Recommended Adult Immunization Schedule UNITED STATES - 2011

Note: These recommendations *must* be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

**Figure 1. Recommended adult immunization schedule, by vaccine and age group**

VACCINE	AGE GROUP	19–26 years	27–49 years	50–59 years	60–64 years	≥65 years	
Influenza <sup>1,*</sup>		1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap) <sup>2,*</sup>		Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					Td booster every 10 yrs
Varicella <sup>3,*</sup>		2 doses					
Human papillomavirus (HPV) <sup>4,*</sup>		3 doses (females)					
Zoster <sup>5</sup>					1 dose		
Measles, mumps, rubella (MMR) <sup>6,*</sup>		1 or 2 doses			1 dose		
Pneumococcal (polysaccharide) <sup>7,8</sup>		1 or 2 doses				1 dose	
Meningococcal <sup>9,*</sup>		1 or more doses					
Hepatitis A <sup>10,*</sup>		2 doses					
Hepatitis B <sup>11,*</sup>		3 doses					

\* 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)

  No recommendation

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](http://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](http://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](http://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**

VACCINE	INDICATION	HIV infection <sup>3,6,12,13</sup>		Diabetes, heart disease, chronic lung disease, chronic alcoholism	Asplenia <sup>12</sup> (including elective splenectomy) and persistent complement component deficiencies	Chronic liver disease	Kidney failure, end-stage renal disease, receipt of hemodialysis	Health care personnel
		CD4+ T lymphocyte count						
Influenza <sup>1,*</sup>		1 dose TIV annually						1 dose TIV or LAIV annually
Tetanus, diphtheria, pertussis (Td/Tdap) <sup>2,*</sup>		Td	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Varicella <sup>3,*</sup>		Contraindicated		2 doses				
Human papillomavirus (HPV) <sup>4,*</sup>		3 doses for females through age 26 yrs						
Zoster <sup>5</sup>		Contraindicated		1 dose				
Measles, mumps, rubella (MMR) <sup>6,*</sup>		Contraindicated		1 or 2 doses				
Pneumococcal (polysaccharide) <sup>7,8</sup>		1 or 2 doses						
Meningococcal <sup>9,*</sup>		1 or more doses						
Hepatitis A <sup>10,*</sup>		2 doses						
Hepatitis B <sup>11,*</sup>		3 doses						

\* 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)

  No recommendation

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).

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 January 1, 2011. For all vaccines being recommended on the Adult Immunization Schedule: A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. 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](http://www.cdc.gov/vaccines/pubs/acip-list.htm)).



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

**Figure—Continued****1. Seasonal influenza vaccination**

Annual vaccination against influenza is recommended for all persons 6 months of age or older, including all adults. Healthy, nonpregnant adults younger than 50 years without high-risk medical conditions can receive either intranasally administered live, attenuated influenza vaccine (FluMist<sup>®</sup>) or inactivated vaccine. Other persons should receive the inactivated vaccine. Adults aged 65 years or older can receive the standard seasonal influenza vaccine or the high-dose (Fluzone<sup>®</sup>) seasonal influenza vaccine. Additional information on influenza vaccination is available at [www.cdc.gov/vaccines/vpd-vac/flu/default.htm](http://www.cdc.gov/vaccines/vpd-vac/flu/default.htm).

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

Administer a 1-time dose of Tdap to adults younger than 65 years who have not received Tdap previously or for whom vaccine status is unknown to replace 1 of the 10-year Td boosters, and as soon as feasible to all 1) postpartum women, 2) close contacts of infants younger than 12 months (e.g., grandparents or child-care providers), and 3) health care personnel with direct patient contact. Adults age 65 years or older who have not previously received Tdap and who have close contact with an infant younger than 12 months should also be vaccinated. Other adults aged 65 years or older may receive Tdap. Tdap can be administered regardless of the interval since the last tetanus- or diphtheria-containing vaccine.

Adults with an uncertain or incomplete history of completing a 3-dose primary vaccination series with tetanus- and diphtheria toxoid-containing vaccines should begin or complete a primary vaccination series. For unvaccinated adults, administer the first 2 doses at least 4 weeks apart and the third dose 6 to 12 months after the second. If the person is incompletely vaccinated (i.e., he or she has received less than 3 doses), administer the remaining doses. Substitute a 1-time dose of Tdap for 1 of the doses of Td, either in the primary series or for the routine booster, whichever comes first.

If a woman is pregnant and received the last Td vaccination 10 or more years previously, administer Td during the second or third trimester. If the woman received the last Td vaccination less than 10 years previously, administer Tdap during the immediate postpartum period. At the clinician's discretion, Td may be deferred during pregnancy and Tdap substituted in the immediate postpartum period, or Tdap may be administered instead of Td to a pregnant woman after an informed discussion with the woman.

Consult the Advisory Committee on Immunization Practices statement for recommendations for administering Td as prophylaxis in wound management, available at [www.cdc.gov/vaccines/pubs/acip-list.htm](http://www.cdc.gov/vaccines/pubs/acip-list.htm).

**3. Varicella vaccination**

All adults without evidence of immunity to varicella should receive 2 doses of single-antigen varicella vaccine if not previously vaccinated or the second dose if they have received only 1 dose, 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 persons with immunocompromising conditions) 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 having 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 diagnosis or verification of herpes zoster by a health care provider; or 5) laboratory evidence of immunity or laboratory confirmation of disease.

Pregnant women should be assessed 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 to 8 weeks after the first dose.

**4. Human papillomavirus (HPV) vaccination**

HPV vaccination with either quadrivalent (HPV4) vaccine or bivalent vaccine (HPV2) is recommended for females at age 11 or 12 years and catch-up vaccination for females at ages 13 through 26 years.

Ideally, vaccine should be administered before potential exposure to HPV through sexual activity; however, females who are sexually active should still be vaccinated consistent with age-based recommendations. Sexually active females who have not been infected with any of the 4 HPV vaccine types (types 6, 11, 16, 18, all of which HPV4 prevents) or any of the 2 HPV vaccine types (types 16 and 18, both of which HPV2 prevents) receive the full benefit of the vaccination. Vaccination is less beneficial for females who have already been infected with 1 or more of the HPV vaccine types. HPV4 or HPV2 can be administered to persons with a history of genital warts, abnormal Papanicolaou test, or positive HPV DNA test, because these conditions are not evidence of prior infection with all vaccine HPV types.

HPV4 may be administered to males aged 9 through 26 years to reduce their likelihood of genital warts. HPV4 would be most effective when administered before exposure to HPV through sexual contact.

A complete series for either HPV4 or HPV2 consists of 3 doses. The second dose should be administered 1 to 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 persons with the medical indications described in Figure 2, "Vaccines that might be indicated for adults based on medical and other indications," it may be administered to these persons because the HPV vaccine is not a live-virus vaccine. However, the immune response and vaccine efficacy might be less for persons with the medical indications described in Figure 2 than in persons who do not have the medical indications described or who are immunocompetent.

**5. Herpes zoster vaccination**

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

**6. Measles, mumps, rubella (MMR) vaccination**

Adults born before 1957 generally are considered immune to measles and mumps. All adults born in 1957 or later should have documentation of 1 or more doses of MMR vaccine, unless they have a medical contraindication to the vaccine, laboratory evidence of immunity to each of the 3 diseases, or documentation of provider-diagnosed measles or mumps disease. For rubella, documentation of provider-diagnosed disease is not considered acceptable evidence of immunity.

*Measles component:* A second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who 1) have been recently exposed to measles or are in an outbreak setting; 2) are students in postsecondary educational institutions; 3) work in a health care facility; or 4) plan to travel internationally. Persons who received inactivated (killed) measles vaccine or measles vaccine of unknown type from 1963 to 1967 should be revaccinated with 2 doses of MMR vaccine.

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**Figure—Continued**

**Mumps component:** A second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who 1) live in a community experiencing a mumps outbreak and are in an affected age group; 2) are students in postsecondary educational institutions; 3) work in a health care facility; or 4) plan to travel internationally. Persons vaccinated before 1979 with either killed mumps vaccine or mumps vaccine of unknown type who are at high risk for mumps infection (for example, persons who are working in a health care facility) should be revaccinated with 2 doses of MMR vaccine.

**Rubella component:** For women of childbearing age, regardless of birth year, rubella immunity should be determined. If there is no evidence of immunity, women who are not pregnant should be vaccinated. Pregnant 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.

**Health care personnel born before 1957:** For unvaccinated health care personnel born before 1957 who lack laboratory evidence of measles, mumps, and/or rubella immunity or laboratory confirmation of disease, health care facilities should 1) consider routinely vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval (for measles and mumps) and 1 dose of MMR vaccine (for rubella), and 2) recommend 2 doses of MMR vaccine at the appropriate interval during an outbreak of measles or mumps, and 1 dose during an outbreak of rubella. Complete information about evidence of immunity is available at [www.cdc.gov/vaccines/recs/provisional/default.htm](http://www.cdc.gov/vaccines/recs/provisional/default.htm).

**7. Pneumococcal polysaccharide (PPSV) vaccination**

Vaccinate all persons with the following indications.

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

**Other:** Residents of nursing homes or long-term care facilities and persons who smoke cigarettes. Routine use of PPSV is not recommended for American Indians/Alaska Natives or persons younger than 65 years unless they have underlying medical conditions that are PPSV indications. However, public health authorities may consider recommending PPSV for American Indians/Alaska Natives and persons aged 50 through 64 years who are living in areas where the risk for invasive pneumococcal disease is increased.

**8. Revaccination with PPSV**

One-time revaccination after 5 years is recommended for persons aged 19 through 64 years with chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); and for persons with immunocompromising conditions. For persons aged 65 years or older, 1-time revaccination is recommended if they were vaccinated 5 years or more previously and were younger than 65 years at the time of primary vaccination.

**9. Meningococcal vaccination**

Meningococcal vaccine should be administered to persons with the following indications.

**Medical:** A 2-dose series of meningococcal vaccine is recommended for adults with anatomic or functional asplenia, or persistent complement component deficiencies. Adults with HIV infection who are vaccinated should also receive a routine 2-dose series. The 2 doses should be administered at 0 and 2 months.

**Other:** A single dose of meningococcal vaccine is recommended for unvaccinated first-year college students living in dormitories; microbiologists 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 through 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, quadrivalent (MCV4) is preferred for adults with any of the preceding indications who are aged 55 years or younger; meningococcal polysaccharide vaccine (MPSV4) is preferred for adults aged 56 years or older. Revaccination with MCV4 every 5 years is recommended for adults previously vaccinated with MCV4 or MPSV4 who remain at increased risk for infection (e.g., adults with anatomic or functional asplenia, or persistent complement component deficiencies).

**10. Hepatitis A vaccination**

Vaccinate persons with any of the following indications and any person seeking protection from hepatitis A virus (HAV) infection.

**Behavioral:** Men who have sex with men and persons who use injection drugs.

**Occupational:** Persons working with HAV-infected primates or with HAV in a research laboratory setting.

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

**Other:** Persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (a list of countries is available at [www.cdc.gov/travel/content/diseases.aspx](http://www.cdc.gov/travel/content/diseases.aspx)).

Unvaccinated persons who anticipate close personal contact (e.g., household or regular babysitting) with an international adoptee during the first 60 days after arrival in the United States from a country with high or intermediate endemicity should be vaccinated. The first dose of the 2-dose hepatitis A vaccine series should be administered as soon as adoption is planned, ideally 2 weeks or more before the arrival of the adoptee.

Single-antigen vaccine formulations should be administered in a 2-dose schedule at either 0 and 6 to 12 months (Havrix®), or 0 and 6 to 18 months (Vaqta®). If the combined hepatitis A and hepatitis B vaccine (Twinrix®) is used, administer 3 doses at 0, 1, and 6 months; alternatively, a 4-dose schedule may be used, administered on days 0, 7, and 21 to 30, followed by a booster dose at month 12.

**11. Hepatitis B vaccination**

Vaccinate persons with any of the following indications and any person seeking protection from hepatitis B virus (HBV) infection.

**Behavioral:** Sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than one sex partner during the previous 6 months); persons seeking evaluation or treatment for a sexually transmitted disease (STD); current or recent injection-drug users; and men who have sex with men.

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

**Medical:** Persons with end-stage renal disease, including patients receiving hemodialysis; persons with HIV infection; and persons with chronic liver disease.

**Other:** Household contacts and sex partners of persons with chronic HBV infection; clients and staff members of institutions for persons with developmental disabilities; and international travelers to countries with high or intermediate prevalence of chronic HBV infection (a list of countries is available at [www.cdc.gov/travel/content/diseases.aspx](http://www.cdc.gov/travel/content/diseases.aspx)).

Hepatitis B vaccination is recommended for all adults in the following settings: 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 day care facilities for persons with developmental disabilities.

**Figure—Continued**

Give or complete a 3-dose series of hepatitis B vaccine to those persons not previously fully vaccinated. The second dose should be given 1 month after the first dose; the third dose should be given at least 2 months after the second dose (and at least 4 months after the first dose). If the combined hepatitis A and hepatitis B vaccine (Twinrix®) is used, give 3 doses at 0, 1, and 6 months; alternatively, a 4-dose Twinrix® schedule, given on days 0, 7, and 21 to 30, followed by a booster dose at month 12 may be used.

Adult patients receiving hemodialysis or with other immunocompromising conditions should receive 1 dose of 40 µg/mL (Recombivax HB®) given on a 3-dose schedule or 2 doses of 20 µg/mL (Engerix-B®) given simultaneously on a 4-dose schedule at 0, 1, 2, and 6 months.

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

One dose of Hib vaccine should be considered for persons who have sickle cell disease, leukemia, or HIV infection, or who have had a splenectomy, if they have not previously received Hib vaccine.

**13. Immunocompromising conditions**

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

## APPENDIX: MEMBERS OF THE ADVISORY COMMITTEE ON IMMUNIZATION PRACTICES

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‡ Deceased.