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RECOMMENDATIONS FOR USE AND STORAGE OF IMMUNOBIOLOGICS AND OTHER PROPHYLACTIC AGENTS

6R199G B-71 (Revised Feb. 2007)

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IMMUNIZATION PROCEDURES:

INTRODUCTION: This immunization guide is a compilation of the generally accepted recommendations of the United States Department of Health and Human Services' Advisory Committee on Immunization Practices (ACIP) and of the American Academy of Pediatrics (AAP). The recommendations put forth in this publication are to be used as guidelines and not absolute standards. ACIP, AAP, and AAFP currently issue joint guidelines on childhood immunizations annually, the Recommended Childhood and Adolescent Immunization Schedule, United States.

GENERAL INFORMATION: Routine immunizations should not be given to persons moderately or severely ill or with marked fever during the previous 24 hours. However, the presence of mild illness with or without fever is not usually a contraindication to immunization. The product description and directions provided by the manufacturer in the package insert should be read carefully. No product may be used beyond its expiration date, nor contrary to recommendations in the package insert.

VACCINE INFORMATION STATEMENTS (VIS): As required under the National Childhood Vaccine Injury Act (42 U.S.C. section 300 a.a. 26), all health care providers in the United States who administer to any child or adult any vaccine containing diphtheria, tetanus, pertussis, measles, mumps, rubella, polio, hepatitis A, hepatitis B, Haemophilus influenzae type b (Hib), trivalent influenza, pneumococcal conjugate, or varicella (chickenpox) vaccine shall, prior to administration of each dose of the vaccine, provide a copy to keep of the relevant current edition vaccine information materials that have been produced by the Centers for Disease Control and Prevention (CDC) to the parent or legal representative of any child to whom the provider intends to administer such vaccine, and to any adult to whom the provider intends to administer such vaccine. (In the case of an incompetent adult, relevant VISs shall be provided to the individual's legal representative. If the incompetent adult is living in a long-term care facility, all relevant VISs may be provided at the time of admission, or at the time of consent if later than admission, rather than prior to each immunization.) If there is not a single VIS. for a combination vaccine, use the VISs for all component vaccines. The materials shall be supplemented with visual presentations or oral explanations, as appropriate.

Other VISs that are available are, Pneumococcal Polysaccharide, Meningococcal*, Rabies, Rotavirus*, Yellow Fever, Typhoid, Japanese Encephalitis, Anthrax, Smallpox, Human Papillomavirus Vaccine (HPV)* and the Zoster (shingles) vaccine. Their use is not required by the National Childhood Injury Act, but is strongly encouraged - and they must be used when giving vaccines purchased through a CDC contract.

*Use of VISs for HPV, meningococcal, and rotavirus vaccines will become mandatory at a later date.

RECORD KEEPING: Health care providers shall make a notation in each patient's permanent medical record at the time vaccine information materials are provided indicating: (1) the edition date of the VIS distributed, and (2) the date the VIS was provided. This record-keeping requirement supplements the requirement of 42 U.S.C. section 300 a.a. 25 that all health care providers administering these vaccines must record in the patient's permanent medical record (or in a permanent office log): (3) the name, address and title of the individual who administers the vaccine (The address should be the address where the record is kept. For example, if immunizations are given at a shopping mall, the address would be the clinic where the permanent record will reside after the provider returns it to the clinic.), (4) the date of administration and (5) the vaccine manufacturer and lot number of the vaccine used.

VACCINES FOR CHILDREN (VFC) ELIGIBILITY SCREENING: The Vaccines for Children Program is a federally funded state-operated vaccine distribution program. The Los Angeles County Immunization Program (LACIP) participates in this program and receives VFC-purchased vaccines from the state in addition to other federal and state purchased vaccines. Under the VFC Program each child 18 years of age and younger is required to be screened for VFC eligibility before immunization. VFC eligibility criteria are:

1. Medi-Cal or Child Health Disability Program (CHDP) eligible; or
2. No health insurance; or
3. American Indian or Native Alaskan; or
4. Insurance that does not cover vaccines.

VFC eligibility requirements are incorporated in the LACDHS Immunization Record Card (H-519) and in the County's immunization registry (LINK). Check only one eligibility criterion; if a child meets two or more of the eligibility criteria, check the first one that applies. The child does not need to be rescreened at subsequent visits unless his/her eligibility status has changed. **Even if a child is not VFC eligible, LACIP-supplied vaccine may still be used if the LACIP vaccine use guidelines are followed.**

STORAGE OF IMMUNOBIOLOGICS: Vaccines, especially live virus vaccines, are fragile substances. To insure potency, vaccines are to be stored and handled as recommended by the manufacturer in the package insert. All refrigerators should have separate thermometers in both the refrigerator and freezer compartments. Check the temperature of both the refrigerator and freezer at least **twice** daily and record temperatures on a temperature log posted on the refrigerator/freezer. Do not store vaccine in the refrigerator door. (See section in this guide on Storage and Handling of Common Immunobiologics.)

V*ACCINE ADVERSE EVENTS REPORTING SYSTEM (VAERS):* VAERS is the national program that monitors the safety of vaccines after they are licensed and is jointly administered by the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA). FDA and CDC analyze VAERS data to identify potential new vaccine safety concerns that may need further study. The National Childhood Vaccine Injury Act of 1986 mandates that health care providers report specific adverse events that occur after vaccination. The events that require reporting to VAERS are listed in the Table of Reportable Events and can be found at http://www.vaers.org/reportable.htm or contact LACIP for a copy of the table. Providers are also encouraged to report adverse events that are not listed in the Table of Reportable Events. Report all significant adverse events that occur after vaccination of adults and children, even if you are not sure whether the vaccine caused the adverse event. There are three ways to report to VAERS: 1) Online via a secure website at https://secure.vaers.org/VaersDataEntryintro.htm, 2) Fax a completed VAERS form to 877-721-0366, or 3) Mail a completed VAERS form to VAERS, P.O. Box 1100, Rockville, MD 20849-1100. A VAERS form may be downloaded from the VAERS web site at http://www.vaers.org/pdf/vaers_form.pdf. Alternatively, you may request a VAERS form by sending an email to info@vaers.org, by calling toll-free 800-822-7967, or by sending a faxed request to 877-721-0366. For additional information on VAERS or vaccine safety, visit the VAERS website at http://www.vaers.org or call 800-822-7967. **Providers receiving vaccines from LACIP are requested to send a copy of all VAERS reports to LACIP at 3530 Wilshire Blvd., Suite 700, Los Angeles, CA 90010 or fax a copy to LACIP at (213) 351-2782.** If additional information is needed, contact LACIP at (213) 351-7800, or visit the Immunization Program Website at http://www.lapublichealth.org/ip/.

TUBERCULIN SKIN TESTING AND IMMUNIZATION (MANTOUX): Measles illness, severe acute or chronic infections, HIV infection, and malnutrition can create a relatively anergic state during which the tuberculin skin test (TST) (previously referred to as purified protein derivative [PPD] skin test) might give a false negative reaction. Although any live

attenuated measles vaccine can theoretically suppress TST reactivity, the degree of suppression is probably less than that occurring from acute infection from wild-type measles virus.

TST and measles-containing vaccine can be administered at the same visit. Simultaneously administering TST and measles-containing vaccine does not interfere with reading the TST result at 48-72 hours and ensures that the person has received measles vaccine. If the measles-containing vaccine has been administered recently, TST screening should be delayed for at least 4 weeks after vaccination. A delay in performing TST will remove the concern of any theoretical but transient suppression of TST reactivity from the vaccine.

No data exist for the potential degree of TST suppression that might be associated with other injectable, live-attenuated virus vaccines (e.g., varicella and yellow fever). However, in the absence of data, following guidelines for measles-containing vaccine when scheduling TST screening and administering other live-attenuated virus vaccines is prudent. If the opportunity to vaccinate might be missed, vaccination should not be delayed only because of these theoretical considerations. Because of similar concerns about smallpox vaccine and TST suppression, a TST should not be performed until four weeks after smallpox vaccination.

*TIME INTERVAL BETWEEN DOSES: A*vailable data indicate that intervals between doses longer than those routinely recommended do not affect seroconversion rate or titer when the schedule was completed. Consequently, it is not necessary to restart the series or add doses of any vaccine because of an extended interval between doses. The only exception to this rule is oral typhoid vaccine in some circumstances. In the case of oral typhoid, some experts recommend repeating the series if the four-dose series is extended to more than 3 weeks.

Vaccine doses should not be administered at intervals less than the recommended minimal intervals or earlier than the minimal ages. Two exceptions to this may occur. The first is for measles vaccine during a measles outbreak, when the vaccine may be administered at an age younger than 12 months (this dose would not be counted, and would be repeated at 12 months of age or older). The second consideration involves administering a dose a few days earlier than the minimum interval or age, which is unlikely to have a substantially negative effect on the immune response to that dose. Vaccine doses administered up to 4 days before the minimum interval or age can be counted as valid. This 4-day recommendation does not apply to rabies vaccine because of the unique schedule for this vaccine. Doses administered 5 days or earlier than the minimum interval or age should not be counted as valid doses and should be repeated as age appropriate. The repeat dose should be spaced after the invalid dose by a time greater than the recommended minimum interval shown in Table 1.

Table 1: Recommended And Minimum Ages And Intervals Between Vaccine Doses*

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 (Hep B)-1[†]	Birth	Birth	1-4 months	4 weeks
HepB-2	1-2 months	4 weeks	2-17 months	8 weeks
HepB-3[§]	6-18 months	24 weeks	-	-
Diphtheria-tetanus-acellular pertussis (DTaP)-1[†]	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	6 months[¶**]
DTaP-4	15-18 months	12 months	3 years	6 months[¶]
DTaP-5	4-6 years	4 years	-	-
Haemophilus influenzae type b (Hib)-1[†,††]	2 months	6 weeks	2 months	4 weeks
Hib-2	4 months	10 weeks	2 months	4 weeks
Hib-3[§§]	6 months	14 weeks	6-9 months[¶]	8 weeks
Hib-4	12-15 months	12 months	-	-
Inactivated poliovirus (IPV)-1[†]	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[††]	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[¶¶]	12-15 months	12 months	3-5 years	4 weeks
MMR-2[¶¶]	4-6 years	13 months	-	-
Varicella (Var)-1[¶¶]	12-15 months	12 months	3-5 years	12 weeks[***]
Var-2[¶¶]	4-6 years	15 months	-	-
Hepatitis A (HepA)-1[†]	12-23 months	12 months	6-18 months	6 months
HepA-2	18-41 months	18 months	-	-
Influenza inactivated[†††]	6-59 months	6 months[§§§]	1 month	4 weeks
Influenza live attenuated[†††]	-	5 years	6-10 weeks	6 weeks

Vaccine and dose number	Recommended age for this dose	Minimum age for this dose	Recommended interval to next dose	Minimum interval to next dose
Meningococcal conjugate (MCV)[†]	11-12 years	11 years	-	-
Meningococcal polysaccharide (MPSV)-1	-	2 years	5 years[§§§]	5 years[¶¶¶¶]
MPSV-2[****]	-	7 years	-	-
Tetanus-diphtheria (Td)	11-12 years	7 years	10 years	5 years
Tetanus-diphtheria acellular pertussis (Tdap)[††††]	≥11 years	10 years	-	-
Pneumococcal polysaccharide (PPV)-1	-	2 years	5 years	5 years
PPV-2[§§§§]	-	7 years	-	-
Human papillomavirus (HPV)-1[¶¶¶¶]	11-12 years	9 years	2 months	4 weeks
HPV-2	11-12 years (+2 months)	109 months	4 months	4 weeks
HPV-3	11-12 years (+6 months)	112 months	-	-
Rotavirus (RV)-1[*****]	2 months	6 weeks	2 months	4 weeks
RV-2	4 months	10 weeks	4 months	4 weeks
RV-3	6 months	14 weeks	-	-
Zoster[†††††]	60 years	60 years	-	-

[*] Combination vaccines are available. Use of licensed combination vaccines is preferred over separate injections of their equivalent component vaccines (Source: 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). MMWR1999; 48[No. RR-5];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.

[‡] Combination vaccines containing the Hepatitis B component are available (HepB-Hib, DTaP-HepB-IPV, and HepA-HepB). These vaccines should not be administered to infants aged <6 weeks because of the other components (i.e., Hib, DTaP, HepA, and IPV).

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

[¶] Calendar months.

[**] 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.

[††] For Hib and PCV, children receiving the first dose of vaccine at age >7 months 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).

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

[¶¶] Combination measles-mumps-rubella-varicella (MMRV) vaccine can be used for children aged 12 months–12 years.

[***] The minimum interval from VAR-1 to VAR-2 for persons beginning the series at age >13 years is 4 weeks.

[†††] Two doses of influenza vaccine are recommended for children aged <9 years who are receiving the vaccine for the first time. Children aged <9 years who have previously received influenza vaccine, and persons aged >9 years require only 1 dose per influenza season.

[§§§] The minimum age for inactivated influenza vaccine varies by vaccine manufacturer. Only Fluzone (manufactured by sanofi pasteur) is approved for children aged 6–35 months. The minimum age for Fluvirin (manufactured by Novartis) is 4 years. For Fluarix and FluLeval (manufactured by GlaxoSmithKline), the minimum age is 18 years.

[¶¶¶] Certain experts recommend a second dose of MPSV 3 years after the first dose for persons at increased risk for meningococcal disease.

[****] A second dose of meningococcal vaccine is recommended for persons previously vaccinated with MPSV who remain at high risk for meningococcal disease. MCV4 is preferred when revaccinating persons aged 11–55 years, but a second dose of MPSV is acceptable. (Source: CDC. Prevention and control of meningococcal disease: recommendations of the Advisory Committee on Immunization Practices [ACIP]. MMWR 2005;54[No. RR-7]).

[††††] Only 1 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 aged 7–9 years, 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.

[§§§§] 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 aged <10 years of age at the time of revaccination. (Source: CDC. Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices [ACIP]. MMWR 1997;46[No. RR-8]).

[¶¶¶¶] HPV is approved only for females aged 9–26 years.

[*****] The first dose of RV must be administered at age 6–12 weeks. The vaccine series should not be started at age >13 weeks. RV should not be administered to children aged >33 weeks regardless of the number of doses received at age 6–32 weeks.

[†††††] Herpes zoster vaccine is approved as a single dose for persons who are aged >60 years with a history of varicella.

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

IMMUNIZATION FOR FOREIGN TRAVEL: The only vaccine required by International Health Regulations is yellow fever vaccination for travel to certain countries in sub-Saharan Africa and tropical South America. Meningococcal vaccination is required by the government of Saudi Arabia for annual travel during the Hajj.

Some immunizations are not required under the international health regulations but are recommended to protect the health of the traveler. For some diseases there are no vaccines available, therefore, prevention requires specific behaviors or chemoprophylactic medications. Vaccinations against diphtheria, tetanus, pertussis, measles, mumps, rubella, hepatitis A, hepatitis B, poliomyelitis, *Haemophilus influenzae* type b, varicella, and *Streptococcus pneumoniae*, routinely are administered in the United States, usually in childhood. If persons do not have a history of adequate protection against these diseases, immunizations appropriate to their age and previous immunization status should be obtained.

For certain types of travel, yellow fever vaccine, Japanese encephalitis vaccine, typhoid vaccine, poliomyelitis vaccine, hepatitis A vaccine or immune globulin, and malaria prophylaxis are recommended. Information on travel immunization recommendations is contained in CDC's publication *Health Information for International Travel* (The Yellow Book). The current edition of this publication can be found at: http://www.cdc.gov/travel/yb/, or information about ordering the Yellow Book and International Certificates of Vaccination and recorded messages on travel-related health topics can be obtained by calling Travelers' Health Automated Information Line at: 877-FYI-TRIP toll free.

SIMULTANEOUS ADMINISTRATION OF CERTAIN IMMUNOBIOLOGICS:

1. Simultaneous administration of the most widely used live and inactivated vaccines does not result in decreased antibody responses or increased rates of adverse reactions.

2. Simultaneous administration of all vaccines for which a child is eligible can be very important in childhood vaccination programs because it increases the probability that a child will be fully immunized at the appropriate age.

3. Individual vaccines should not be mixed in the same syringe unless they are licensed for mixing by the Food and Drug Administration. Only the sanofi-pasteur Hib/DTaP (TriHIBit) vaccine is licensed for mixing in the same syringe.

4. Live parenteral (injected) vaccines (MMR, MMRV, varicella, and yellow fever) and live attenuated influenza vaccine (LAIV) that are not administered simultaneously should be separated by at least 4 weeks. This precaution is intended to reduce or eliminate interference from the vaccine given first on the vaccine given later. If two live parenteral vaccines or LAIV are not administered simultaneously but are separated by less than 4 weeks, the vaccine given second should be repeated in 4 weeks or confirmed to be effective by serologic testing of the recipient (serologic testing is not recommended for LAIV). An exception to this recommendation is yellow fever vaccine administered less than 4 weeks after single-antigen measles vaccine. A 1999 study demonstrated that yellow fever vaccine is not affected by measles vaccine given 1-27 days earlier. The effect of nonsimultaneously administered rubella, mumps, varicella, and yellow fever vaccines is not known.

5. Live vaccines administered by the oral route (oral polio vaccine [OPV], oral typhoid) are not believed to interfere with each other if not given simultaneously. These vaccines may be given at any time before or after each other. Oral typhoid is not licensed for children younger than 6 years of age, and OPV is no longer available in the United States, so these vaccines are not likely to be given to the same child.

6. Parenteral live vaccines (MMR, MMRV, varicella, and yellow fever) and LAIV are not believed to have an effect on live vaccines given by the oral route (OPV, oral typhoid). Live oral vaccines may be given at any time before or after live parenteral vaccines or LAIV.

7. All other combinations of two inactivated vaccines, or live and inactivated vaccines, may be given at any time before or after each other.

8. Inactivated antigens are generally not substantially affected by circulating antibody, so they can be administered before, after, or at the same time as the antibody. Simultaneous administration of antibody (in the form of immune globulin) and vaccine is recommended for postexposure prophylaxis of certain diseases, such as hepatitis B, rabies, and tetanus.

9. If a live parenteral vaccine (measles-mumps-rubella [MMR], MMRV, or varicella) must be given around the time that antibody is given, the two must be separated by enough time so that the antibody does not interfere with viral replication. If the live vaccine is given first, it is necessary to wait at least 2 weeks (i.e., an incubation period) before giving the antibody. If the interval between the vaccine and antibody is less than 2 weeks, the recipient should be tested for immunity or the vaccine dose should be repeated.

10. If the antibody is given before a dose of MMR or varicella vaccine, it is necessary to wait until the antibody has waned (degraded) before giving the vaccine to reduce the chance of interference by the antibody. The necessary interval between an antibody-containing product and MMR or varicella vaccine depends on the concentration of antibody in the product. A table listing the recommended intervals between administration of antibody products and live vaccines (MMR and varicella) can be found below (Table 2).

11. Although passively acquired antibodies can interfere with the response to rubella vaccine, the low dose of anti-Rho(D) globulin administered to postpartum women has not been demonstrated to reduce the response to the RA27/3 strain rubella vaccine. Because of the importance of rubella immunity among childbearing age women, postpartum vaccination of rubella-susceptible women with rubella or MMR vaccine should not be delayed because of receipt of anti-Rho(D) globulin or any other blood product during the last trimester of pregnancy or at delivery. These women should be vaccinated immediately after delivery and, if possible, tested 3 months later to ensure immunity to rubella and, if necessary, to measles.

12. Oral typhoid, and yellow fever vaccines are not affected by the administration of immune globulin or blood products. They may be given simultaneously with blood products, or separated by any interval.

13. Two antibody products are available for the prevention of respiratory syncytial virus (RSV) infection in infants and young children. RSV-IG (RespiGam) is an intravenous human immune globulin product. RSV-IG contains other human antibodies in addition to antibody to RSV, and may interfere with live parenteral vaccines for as long as 9 months. Palivizumab (Synagis) contains only monoclonal antibody to respiratory syncytial virus (RSV). It does not interfere with the response to live virus vaccines.

USE OF LIVE MEASLES-CONTAINING VACCINES AND VARICELLA VACCINE AFTER ADMINISTRATION OF IMMUNE GLOBULIN PREPARATIONS

See Table 2 below.

Table 2. Suggested Intervals Between Administration Of Immune Globulin Preparations For Different Indications And Measles-Containing Vaccine And Varicella Vaccine*

Product/indication	Dose, including mg immunoglobulin G (lgG)/kg body weight*	Suggested Interval before Measles or Varicella Vaccination
RSV monocional antibody (Synagis™)†	15 mg/kg IM	None
Tetanus (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	0.06 mL/kg (10 mg IgG/kg) IM	3 months
Rabies IG	20 IU/kg (22 mg IgG/kg) IM	4 months
Measles prophylaxis IG		
Standard 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 transfusion		
Red blood cells (RBCs), washed	10 mL/kg negligible IgG/kg) IV	None
RBCs, adenine-saline	10 mL/kg (10 mg IgG/kg) IV	3 months
Packed RBCs (Hct 65%)§	10 mL/kg (60 mg IgG/kg) IV	6 months
Whole blood (Hct 35-50%)§	10 mL/kg (80-100 mg igG/kg) IV	6 months
Plasma/platelet products	10 mL/kg (160 mL IgG/kg) IV	7 months
Cytomegalovirus intravenous immune globulin (IGIV)	150 mg/kg maximum	6 months
IGIV		
Replacement therapy for immune deficiencies¶	300-400-mg/kg IV¶	8 months
Postexposure varicella prophylaxis**	400 mg/kg IV	8 months
ITP††	400 mg/kg IV	8 months
ITP††	1000 mg/kg IV	10 months
Kawasaki disease	2 grams/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 halflife 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.

† Contains antibody only to respiratory syncytial virus

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

¶ 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.

** 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. 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 pregnant women who cannot receive VariZIG within 96 hours of exposure, clinicians can choose either to administer IGIV or closely monitor the women for signs and symptoms of varicella and institute treatment with acyclovir if illness occurs. (**Source:** CDC. A new product for postexposure prophylaxis available under an investigational new drug application expanded access protocol. MMWR 2006;55:209–10).

†† Immune thrombocytopenic purpura

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IMMUNOBIOLOGICS

IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Anthrax Vaccine Absorbed (AVA) Bio Thrax™ BioPort Corporation	**Persons aged 18 years through 65 years** First: 0.5 mL SC Second: 0.5 mL SC 2 weeks later Third: 0.5 mL SC 2 weeks later Fourth: 0.5 mL SC 5 months later Fifth: 0.5 mL SC 6 months later Sixth: 0.5 mL SC 6 months later	Dose: 0.5 mL SC at 1 year intervals	**Preexposure:** Routine preexposure vaccination with AVA is indicated for persons engaged in work involving production of quantities or concentrations of B. anthracis cultures and in activities with a high potential for aerosol production. Routine pre-exposure vaccination is only recommended for persons who come in contact in the workplace with imported animal hides, furs, bone meal, wool, animal hair, or bristles for whom industry standards and import restrictions are insufficient to prevent exposure to anthrax spores. Vaccination might be indicated for veterinarians and other persons handling potentially infected animals in areas with a high incidence of anthrax cases. Preexposure vaccination may be indicated for certain military personnel and other select groups who may be exposed to an intentional release of B. anthracis. Preexposure vaccination is not currently recommended for emergency first responders, federal responders, medical practitioners, or private citizens. **Postexposure:** FDA approves AVA only for preexposure vaccination. Postexposure prophylaxis against B. anthracis with antibiotics is recommended following an aerosol exposure to B. anthracis spores. Because of the potential persistence of spores following an aerosol exposure, antibiotic therapy should be continued for at least 60 days if used alone. If AVA vaccine is available, antibiotics can be discontinued after three doses of vaccine have been administered according to the standard schedule (0, 2, and 4 weeks). Although the shortened (3-dose) vaccine regimen has been effective when used in a postexposure regimen that includes antibiotics, the duration of protection after vaccination is not known. Therefore, if subsequent exposures occur, additional vaccinations might be required. **Adverse Reactions:** minor local reactions occur in 20% of vaccinations, moderate local reactions occur in 3% of vaccinations, and severe local reactions occur in 1% of vaccinations. Subcutaneous nodules occur at the injection site in 30%–50% of recipients and persist for several weeks. Systemic reactions (i.e., chills, muscle aches, malaise, or nausea) occur in 5%–35% of vaccine recipients. Severe (e.g., allergic) reactions are rare. **Precautions:** • A moderate or severe acute illness until recovery • Pregnancy • History of Guillain-Barré Syndrome (GBS) **Contraindications:** • History of a severe allergic (anaphylactic) reaction to a vaccine component or following a prior dose • History of anthrax because of observations of more severe adverse reactions among recipients with a history of anthrax disease.

IMMUNOBIOLOGICS

IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Diphtheria and Tetanus Toxoids (DT) Diphtheria and Tetanus Toxoids (Pediatric DT) Sanofi Pasteur	Children 6 weeks through 6 years for whom pertussis vaccine is specifically contraindicated: **Children ≤1 year when beginning series:** First: 0.5 mL IM Second: 0.5 mL IM 4-8 weeks later Third: 0.5 mL IM 4-8 weeks later Fourth: 0.5 mL IM 6-12 mos. later **Children ≥1 year when beginning series:** First: 0.5 mL IM Second: 0.5 mL IM 4-8 weeks later Third: 0.5 mL IM 6-12 mos. later	Fifth: 0.5 mL IM at 4-6 years of age Fifth dose not needed if the fourth dose was given on or after the fourth birthday Fourth: 0.5 mL IM at 4-6 years of age Fourth dose not needed if the third dose was given on or after the fourth birthday	Under 1 year of age, preferred site of vaccine administration is the anterolateral thigh **Diphtheria vaccination for contacts to a diphtheria case:** See Td section **Adverse Reactions:** A small area of erythema and induration with or without tenderness surrounding the injection site, persisting for a few days, is not unusual. Fever, drowsiness, fretfulness, and anorexia occur but are less common following DT that with pertussis-containing vaccines. Severe local reaction may occur, particularly in persons who have had multiple prior boosters. Severe systemic reactions such as generalized urticaria (hives), anaphylaxis, or neurologic complications have been reported. A few cases of Guillain-Barré Syndrome (GBS) have been reported following tetanus toxoid administration. Brachial neuritis has rarely been observed. **Precautions:** History of GBS within 6 weeks of a prior dose of a tetanus-toxoid-containing vaccine. Tetanus vaccination has been very rarely associated with occurrence of GBS. Vaccination is usually justified for children who have had fewer than 3 doses of a tetanus-toxoid-containing vaccine. **Contraindications:** History of a severe allergic reaction to a vaccine component or following a prior dose of the vaccine. Moderate to severe acute illness until improved.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine (DTaP) **Daptacel®** Sanofi Pasteur **Infanrix™** GlaxoSmithKline **Tripedia®** Sanofi Pasteur	**Children 6 weeks through 6 years:** First: 0.5 mL IM Second: 0.5 mL IM 4-8 weeks later Third: 0.5 mL IM 4-8 weeks later Fourth: 0.5 mL IM 6-12 mos. later (See comments) Under 1 year of age, preferred site of administration is anterolateral thigh. Whenever possible the same brand of DTaP vaccine should be used for all doses of the vaccination series. However, vaccination should not be deferred because the brand of DTaP used earlier is not known or is not in stock.	Fifth: 0.5 mL IM at 4-6 years of age Fifth dose not needed if the fourth dose was given on or after the fourth birthday.	The fourth DTaP dose is recommended be administered at 15-18 months of age (17-20 months for Daptacel); it may be administered as early as 12 months of age, provided 6 months have elapsed since the third dose and if the child is unlikely to return at 15-18 months of age. Whether and when to administer DTaP to children with proven or suspected underlying neurologic disorders should be decided individually. Generally, infants and children with stable neurologic conditions, including well-controlled seizures, may be vaccinated (See "Guidelines for Diphtheria-Tetanus-Pertussis Immunization of Young Children with Histories of Convulsions," in this document. Acetaminophen or ibuprofen, administered at the appropriate dose at the time of vaccination and every 4 hours for 24 hours as directed or needed thereafter, reduces the possibility of post-vaccination fever. **Diphtheria vaccination for contacts to a diphtheria case:** See Td section **Adverse Reactions:** Erythema and induration with or without tenderness at the injection site, persisting for a few days, are not unusual. Fever, drowsiness, fretfulness, and anorexia occur but are less common in children who receive DTaP than with DTP. Severe local reaction may occur, particularly in persons who have had multiple doses. There are reports of increased local reaction with the fourth and fifth doses. See DT regarding other rare adverse reactions. Moderate to severe systemic events (such as fever ≥105°F, febrile seizures, persistent crying lasting ≥3 hours, and hypotonic hyporesponsive episodes) have been reported rarely after administration of DTaP. Anaphylaxis occurs rarely. Swelling involving the entire thigh or upper arm has been reported after booster doses of certain acellular pertussis vaccines. The limb swelling may be accompanied by erythema, pain and fever. Although the swelling may interfere with walking, most children have no limitation of activity. **Precautions:** History of one of the following occurring after a prior dose: Temperature of 105°F (40.5°C) or higher within 48 hours that is not due to another identifiable cause; collapse or shock-like state (hypotonic hyporesponsive episode) within 48 hours; persistent, inconsolable crying lasting 3 hours or longer, occurring within 48 hours; and convulsions with or without fever occurring within 3 days. GBS within 6 weeks (See DT precaution section). If a precautionary event occurs, weigh the risks and benefits of further doses of DTaP. Use DT if risks outweigh benefits. **Contraindications:** Severe allergic reaction to a vaccine component or following prior dose of vaccine, and encephalopathy not due to another identifiable cause occurring within 7 days after vaccination. Moderate or severe acute illness until condition improves.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine Adsorbed and *Haemophilus influenzae* Type b (Hib) Conjugate Vaccine (DTaP-Hib) TriHIBit™ [ActHIB® reconstituted with Tripedia®) Sanofi pasteur	Not licensed for use for the first 3 doses	Children needing the fourth dose of DTaP and Hib: Fourth: 0.5 mL IM 6-12 months after the third dose of DTaP and at least 2 months after the last Hib dose and no earlier than 15 months of age	Because of evidence of reduced immunogenicity of the Hib component when used as a combination, TriHIBit is not approved by the Food and Drug Administration for use as the primary series at 2, 4, or 6 months of age. It is approved only for the fourth dose of the DTaP and Hib series. If TriHIBit is administered as one or more doses of the primary series at 2, 4, or 6 months of age, the Hib doses should not be counted, and the child should be revaccinated as age appropriate for Hib. The DTaP doses may be counted as valid and do not need to be repeated. Although TriHIBit cannot be used in the primary series at 2, 4, or 6 months of age, it may be used as the booster (final) dose following a series of single-antigen Hib vaccine or combination hepatitis B–Hib vaccine (Comvax). Therefore, TriHIBit can be used if the child is 12 months of age or younger, has received at least one prior dose of Hib vaccine 2 or more months earlier, and TriHIBit will be the last dose in the Hib series. For example, TriHIBit can be used for the booster dose at 12-15 months of age in a child who has received Comvax or PedvaxHib at 2 and 4 months of age, or three prior doses of HibTiter or ActHib. TriHIBit can also be used at 15-59 months of age in a child who has received at least one prior dose of any Hib-containing vaccine. TriHIBit should not be used if the child has received no prior Hib doses. **Adverse Reactions:** Refer to Adverse Reaction sections for DTaP and Hib conjugate vaccines. **Precautions:** See Precaution section for DTaP **Contraindications:** Hypersensitivity to any vaccine component. See Contraindications sections for DTaP and Hib vaccines

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, Hepatitis B (Recombinant) and Inactivated Poliovirus Vaccine Combined (DTaP-Hep B-IPV) Pediarix™ GlaxoSmithKline	**Children 6 weeks through 6 years:** First: 0.5 mL IM Second: 0.5 mL IM 4-8 weeks later Third: 0.5 mL IM at least 16 weeks after the first dose and at least 8 weeks after the second dose, but not before 6 months of age. Not approved for fourth dose of the DTaP or IPV series	Not approved for the fifth (booster) dose of the DTaP or IPV series	The minimum age for the first dose of Pediarix is 6 weeks, so it cannot be used for the birth dose of the hepatitis B series. Pediarix is approved for the first three doses of the DTaP and inactivated polio vaccine (IPV) series, which are usually given at about 2, 4, and 6 months of age; it is not approved for fourth or fifth (booster) doses of the DTaP or IPV series. However, Pediarix is approved for use through 6 years of age. A child who is behind schedule can still receive Pediarix as long as it is given for doses 1, 2, or 3 of the series, and the child is younger than 7 years of age. A dose of Pediarix inadvertently administered as the fourth or fifth dose of the DTaP or IPV series does not need to be repeated. Pediarix may be used interchangeably with other pertussis containing vaccines if necessary (although ACIP prefers the use of the same brand of DTaP for all doses of the series, if possible). It can be given at 2, 4, and 6 months to infants who received a birth dose of hepatitis B vaccine (total of four doses of hepatitis B vaccine). Although not labeled for this indication by FDA, Pediarix may be used in infants whose mothers are HBsAg positive or whose HBsAg status is not known. **Adverse Reactions:** The adverse reactions are expected to be the same as those of the individual component vaccines. See component vaccines for possible adverse reactions. DTaP-Hep B-IPV vaccine was associated with higher rates of fever, compared to separately administered component vaccines (DTaP, Hepatitis B, and IPV). **Precautions:** The precautions are the same as they are for the individual component vaccines. **Contraindications:** The contraindications are the same as they are for the individual component vaccines.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Haemophilus influenzae Type b Conjugate Vaccine (Hib) HbOC HibTITER® Wyeth PRP-T ActHIB™ Sanofi pasteur PRP-OMPC PedvaxHIB Merck	**Age at First Dose: (Months)** — **Dosing Schedule 0.5 mL IM** HbOC 2-6: 3 doses, 2 months apart 7-11: 2 doses, 2 months apart 12-14: 1 dose 15-59: 1 dose PRP-T 2-6: 3 doses, 2 months apart* 7-11: 2 doses, 2 months apart 12-14: 1 dose 15-59: 1 dose PRP-OMPC 2-6: 2 doses, 2 months apart 7-11: 2 doses, 2 months apart 12-14: 1 dose 15-59: 1 dose The optimal interval between doses is 2 months, with a minimum interval of 4 weeks. * This schedule may only be used when PedvaxHIB is used for both doses for infants 2-6 months.	Dose: 0.5 mL IM 12-15 months of age 12-15 months of age 2 months after first dose None needed 12-15 months of age[§] 12-15 months of age[§] 2 months after first dose None needed 12-15 months of age[§] 12-15 months of age[§] 2 months after first dose None needed [§] At least 2 months after previous dose	Data suggest that if Hib conjugate vaccine is given before 6 weeks of age it may induce immunologic tolerance to additional doses of Hib vaccine. A dose given before 6 weeks of age may reduce the response to subsequent doses. As a result, **Hib vaccine should never be given to a child younger than 6 weeks of age**. All 3 conjugate Hib vaccines are interchangeable. If it is necessary to change vaccine type (or if type of vaccine previously used is unknown), 3 doses of any combination constitute the primary series. Any licensed conjugate vaccine may be used for the booster dose regardless of which vaccine was administered in the primary series Hib vaccine is recommended for persons of any age who are at increased risk for invasive Hib disease including persons with functional or anatomic asplenia (e.g., sickle cell disease, post-splenectomy), immunodeficiency (particularly persons with IgG2 subclass deficiency), immunosuppression from cancer chemotherapy, or infection with HIV). Previously unvaccinated persons >59 months of age at increased risk for invasive Hib disease should receive at least one pediatric dose of any Hib conjugate vaccine. Children <24 months of age who have had invasive Hib disease should still receive Hib vaccine, since many children of that age fail to develop immunity following natural disease. The vaccine series can be initiated (or continued) at the time of hospital discharge. **Adverse Reactions:** Injection site erythema, induration, and/or pain occur in 5-30% of recipients and usually resolves within 12-24 hours. Systemic reactions such as fever and irritability are infrequent. **Contraindications:** Anaphylaxis following a prior dose of Hib vaccine; delay vaccination in children with moderate or severe acute illness until improved; Hib vaccines contraindicated in children <6 weeks of age.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Haemophilus Influenzae Type b and Hepatitis B Vaccine (Hib-HBV) COMVAX™ Combined PedvaxHIB HIB® and Recombivax HB® Merck	**Infants beginning series between 2-11 months of age:** First: 0.5 mL IM Second: 0.5 mL IM 2 months later Third: 0.5 mL IM at 12-15 months of age and at least 2 months after the second dose Interval between doses should be at least 2 months and the full series completed by 12-15 months of age or as soon as possible thereafter. **Children NOT vaccinated according to recommended schedule (i.e., beginning the series late):** The number of doses of PRP-OMPC (i.e., COMVAX or PedvaxHIB) needed to vaccinate against **Hib** disease varies with age of the infant or child at the first dose. **Age at First Dose:** — **Number of Doses Needed*** 12-14 months: 2 15-59 months 1 * Three doses of hepatitis B vaccine are required regardless of the child's age when the series was started (See Hepatitis B section for schedule). Therefore, complete the hepatitis B series with a single antigen hepatitis B vaccine or an appropriate combination hepatitis B vaccine.	Not applicable	Each dose of Comvax contains 7.5 mcg of PRP-OMP Hib vaccine (PedvaxHIB), and 5 mcg of hepatitis B surface antigen. The immunogenicity of the combination vaccine is equivalent to that of the individual antigens administered at separate sites. Comvax is licensed for use at 2, 4, and 12–15 months of age. It may be used whenever either antigen is indicated and the other antigen is not contraindicated. However, **the vaccine must not be administered to infants younger than 6 weeks of age** because of potential suppression of the immune response to the Hib component (see Haemophilus influenzae type b, for more details). Comvax must not be used for doses at birth or 1 month of age for a child on a 0, 1, 6-month hepatitis B vaccine schedule. Although it is not labeled for this indication by FDA, ACIP recommends that Comvax may be used in infants whose mothers are HBsAg positive or whose HBsAg status is unknown. **Adverse Reactions:** See sections on Hib and Hepatitis B **Contraindications:** See sections on Hib and Hepatitis B

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Hepatitis A Vaccine, inactivated (HAV) **HAVRIX®** GlaxoSmithKline Pediatric Formulation (720 EL.U. per 0.5 mL) Adult Formulation (1440 EL.U. per 1.0 mL) **VAQTA®** Merck Pediatric Formulation (25 U per 0.5 mL) Adult Formulation (50 U per 1.0 mL)	**Children 1 through 18 years of age:** HAVRIX (720 ELU) First: 0.5 mL IM Second: 0.5 mL IM 6-12 months later VAQTA (25 U) First: 0.5 mL IM Second: 0.5 mL IM 6-18 months later **Persons age 19 years and older:** HAVRIX (1440 ELU) or VAQTA (50 U) First: 1.0 mL IM Second: 1.0 mL IM 6-12 months later	Not established	Limited data indicate that vaccines from different manufacturers are interchangeable. Completion of the series with the same product is preferable. However, if the originally used product is not available or not known, vaccination with either product is acceptable. The dose given should be based on the person's age at the time of the dose. For example, if a person received the first dose of the pediatric formulation of hepatitis A vaccine at 18 years of age, and returns for the second dose at age 19 years, the second dose should be the adult formulation, not the pediatric formulation. All children should receive hepatitis A vaccine at 12-23 months of age. Children who are not vaccinated by 2 years of age can be vaccinated at subsequent visits. States, counties, and communities with existing Hep A vaccination programs for children 2-18 years of age are encouraged to maintain these programs. California is a state with an existing Hep A vaccination Program. Hepatitis A vaccine is recommended for persons 1 year of age and older who are traveling to or working in countries where they would have a high or intermediate risk of hepatitis A virus infection. These areas include all areas of the world except Canada, Western Europe and Scandinavia, Japan, New Zealand, and Australia. Vaccinated persons can be assumed to be protected by 4 weeks after receiving the first dose, although the second dose 6 to 12 months later is necessary for long-term protection. Other groups which should be offered vaccine include **men who have sex with other men, persons who use illegal drugs, persons who have clotting factor disorders, and persons with occupational risk of infection**. Persons with occupational risk include only those who work with hepatitis A-infected primates or with hepatitis A virus in a laboratory setting. No other groups have been shown to be at increased risk of hepatitis A infection due to occupational exposure. Persons with chronic liver disease **should be vaccinated**. Susceptible persons who either are awaiting or have received liver transplants should be vaccinated. **Adverse Reactions:** Injection site pain, erythema, or swelling is reported by 20% to 50% of recipients. These symptoms are generally mild and self-limited. Mild systemic complaints (e.g., malaise, fatigue, low-grade fever) are reported by fewer than 10% of recipients. No serious adverse reactions have been reported. **Contraindications:** History of a severe allergic reaction to a vaccine component or following a prior dose of hepatitis A vaccine, hypersensitivity to al. Vaccination of persons with moderate or severe acute illnesses should be deferred until the person's condition has improved. The safety of hepatitis A vaccination during pregnancy has not been determined; however, because it is an inactivated vaccine, the theoretical risk to the fetus is low.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Hepatitis A and Hepatitis B (Recombinant) Vaccine (HAV-HBV) Twinrix® (GlaxoSmithKline Pharmaceuticals)	**Persons aged 18 years and over:** First: 1.0 mL IM Second: 1.0 mL IM one month later Third: 1.0 mL IM 5 months later See comments	Not established	Each dose of Twinrix contains 720 EL. U. of hepatitis A vaccine (equivalent to a pediatric dose of Havrix), and 20 mcg of hepatitis B surface antigen protein (equivalent to an adult dose of Engerix-B). The vaccine is administered in a 3 dose series at 0, 1, and 6 months. Appropriate spacing of the doses must be maintained to assure long-term protection from both vaccines. The first and third doses should be separated by at least 6 months. The first and second doses should be separated by at least 4 weeks, and the second and third doses should be separated by at least 5 months. It is not necessary to restart the series or add doses if the interval between doses is longer than the recommended interval. Twinrix is approved for persons aged 18 years and older and can be used in persons in this age group with indications for both hepatitis A and hepatitis B vaccines. Because the hepatitis B component of Twinrix is equivalent to a standard dose of hepatitis B vaccine, the schedule is the same whether Twinrix or single-antigen hepatitis B vaccine is used. Single-antigen hepatitis A vaccine may be used to complete a series begun with Twinrix and vice versa. A person who receives one dose of Twinrix may complete the hepatitis A series with two doses of adult formulation hepatitis A vaccine separated by at least 5 months. A person who receives two doses of Twinrix may complete the hepatitis A series with one dose of adult formulation hepatitis A vaccine or Twinrix 5 months after the second dose. A person who begins the hepatitis A series with single-antigen hepatitis A vaccine may complete the series with two doses of Twinrix or one dose of adult formulation hepatitis A vaccine. **Adverse Reactions**: See hepatitis A vaccine and hepatitis B vaccine **Contraindications:** See hepatitis A vaccine and hepatitis B vaccine

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Hepatitis B Vaccine Recombinant

Engerix-B®
GlaxoSmithKline

Pediatric Formulation
10 mcg/0.5 mL

Adult Formulation
20 mcg/1.0 mL

RECOMBIVAX HB®
Merck

Pediatric Formulation
5 mcg/0.5 mL

Adult Formulation
10 mcg/1.0 mL

Dialysis Formulation
40 mcg/1.0 mL

PRIMARY IMMUNIZATION SCHEDULE

Infants of HBsAg-Positive Mothers*	Other Infants, Children, & Adol. 0-19 yrs**	2-Dose Regimen For Adolescents 11-15 yrs	Adults** ≥20 yrs	Dialysis/Immuno-compromised Adults ≥20 yrs+
Recombivax HB				
5 mcg 0.5 mL IM (3 Doses)	5 mcg 0.5 mL IM (3 Doses)	10 mcg‡ 1.0 mL IM (2 doses)	10 mcg 1.0 mL IM (3 doses)	40 mcg 1.0 mL IM (3 doses)
Engerix-B				
10 mcg§ 0.5 mL IM (3 doses)	10 mcg§ 0.5 mL IM (3 doses)	NA	20 mcg§ 1.0 mL IM (3 doses)	40 mcg¶ 2.0 mL IM (4 doses)

* **Infants of HBsAg-positive mother:** 3 doses: First dose within 12 hours of birth along with HBIG, second dose 1-2 months of age, third dose 6 months of age.
Preterm infants (< 2,000 grams at birth) born to HBsAg-positive mother: 4 doses: Give first dose within 12 hours of birth along with HBIG. Do not count the birth dose in the 3-dose schedule. Administer next dose in the series when the infant is chronologic age 1 month, the third dose 1-2 months after the second, and the fourth dose at 6 mos. of age.
Infants whose mother's HBsAg status is unknown at birth: Same as for infant of HBsAg+ mother except do not give HBIG unless mother is confirmed to be HBsAg+. If mother is HBsAg+ administer HBIG as soon as possible to infant, but no later than 7 days after birth.
Preterm infants (< 2,000 grams at birth) whose mother's HBsAg status is unknown: 4 doses: Administer hepatitis B vaccine within 12 hours of birth. If the maternal HBsAg status cannot be determined within 12 hours of birth administer HBIG. The birth vaccine dose is not counted as part of the series, and the infant should receive three additional doses beginning at age 1 month.

** **Routine Infant Immunization:** 3 doses: For medically stable infants weighing ≥2000 grams at birth born to HBsAg-negative mothers, administer the first vaccine dose before hospital discharge. Administer second dose at age 1-2 months, and third dose at 6-18 months of age. Administer the second dose at least 4 weeks after the first dose and the third dose at least 4 months after the first dose and at least two months after second dose and no sooner than 24 weeks of age.
Preterm infants (<2000 grams at birth) whose mothers are HBsAg-negative: 3 doses: give first dose of hepatitis B vaccine at chronologic age 1 month or at hospital discharge.
Child, Adolescent, and Adult: 3 doses: Initial dose, followed by the second dose 4 weeks later, and the third dose 6 months after the initial dose. Administer the second dose at least 4 weeks after the first dose and the third dose at least 4 months after the first dose and 2 months after the second dose.

§ **Alternate Schedule for Engerix-B:** 4 doses: 0 (initial), 1 month, 2 months, and 12 months after initial dose. Designed for certain populations, e.g., infants born to HBsAg+ mothers.

‡ **RECOMBIVAX HB** for 11-15 year olds: 2 doses: 0 (initial) and 4-6 months later; must be completed before 16th birthday otherwise, complete a 3 dose schedule.

\+ **For Dialysis/Immunocompromised patients <20 years** use standard vaccine dose and schedule given for infants, children, and adolescents. Higher doses might be more immunogenic, but no specific recommendations have been made.

¶ **RECOMBIVAX HB Dialysis Formulation:** 3 doses**:** 0 (initial), 1 month and 6 months after initial dose.

¶¶ **Engerix-B Adult Formulation may be used for dialysis patients:** 4 doses: Two 1.0 mL doses (20 mcg/dose) administered at one site on each visit at 0 (initial), 1 month, 2 months, and 6 months after initial dose.

COMMENTS AND CONTRAINDICATIONS

Booster Doses are **not** recommended for persons with normal immune status, nor is routine serologic testing to assess immune status. For hemodialysis patients, assess the need for booster doses by annual antibody testing, and administer booster doses when antibody levels decline below 10 mIU/mL.

Test infants born to HBsAg-+ mothers for HBsAg and antibody to HBsAg 3-12 months after final HB vaccine dose. Test for antibody 1-2 months after final HB vaccine dose healthcare workers who have contact with patients or blood and are at risk for injuries with sharp instruments or needlesticks, other persons whose subsequent management depends on knowing their immune status, e.g., dialysis patients and staff, and persons for whom a sub-optimal antibody response may be anticipated. Give non-responders 1-3 more HB vaccine doses and then re-test.

H B vaccination is recommended for all infants, children, and adolescents through age 18 years.

Adults at increased risk of HBV infection and therefore vaccine candidates include: Men who have sex with other men, heterosexuals with multiple sex partners, persons diagnosed with a recently acquired sexually transmitted disease, and prostitutes; injection-drug users who share needles; inmates of long-term correctional facilities; persons undergoing hemodialysis; healthcare workers.

Others who may be candidates for vaccination: International travelers to areas with high rates of HBV infection; recipients of clotting factor concentrates; clients and staff in institutions for the developmentally disabled; Alaska Natives, Pacific Islanders, and immigrants and refugees from HBV-endemic areas; screen adoptees/orphans from countries of high or intermediate HBV endemicity for HBsAg, and if positive, vaccinate household members; test household members and sex partners of persons with chronic HBV infection, and vaccinate if susceptible.

Adverse Reactions: Injection site pain; mild systemic complaints, such as fatigue, headache, irritability, and fever.

Contraindications: A severe allergic reaction to a vaccine component or following a prior dose; moderate or severe acute illness until improved.

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Human Papillomavirus Quadrivalent (Types 6, 11, 16, 18) Recombinant Vaccine GARDASIL® Merck	**Girls and women 9-26 years of age:** First: 0.5 mL IM Second: 0.5 mL IM 2 months later Third: 0.5 mL IM 4 months later (6 months after the first dose)	Not established	The HPV vaccine is recommended for 11-12 year-old girls, but can be administered to girls as young as 9 years of age. The vaccine also is recommended for 13-26 year-old females who have not yet received or completed the vaccine series. Ideally, the vaccine should be administered before onset of sexual activity. However, females who are sexually active also may benefit from vaccination. Females who have not been infected with any vaccine HPV type would receive the full benefit of vaccination. Females who already have been infected with one or more HPV type would still get protection from the vaccine types they have not acquired. Few young women are infected with all four HPV types in the vaccine. Currently, there is no test available for clinical use to determine whether a female has had any or all of the four HPV types in the vaccine. **Adverse Reactions:** • Pain at the injection site (about 8 people in 10) • Redness or swelling at the injection site (about 1 person in 4) • Mild fever (100°F) (about 1 person in 10) • Itching at the injection site (about 1 person in 30) • Moderate fever (102°F) (about 1 person in 65) **Precautions:** • Pregnancy (The vaccine appears to be safe for both the mother and the unborn baby, but it is still being studied. Any woman who learns that she was pregnant when she got HPV vaccine is encouraged to call the HPV vaccine in pregnancy registry at 800-986-8999.) • Moderate or severe illness until improved **Contraindications:** • History of a life-threatening allergic reaction to yeast, to any other component of HPV vaccine, or to a previous dose of HPV vaccine

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Live Attenuated Influenza Vaccine (LAIV) FluMist® MedImmune Inc.	**Children 5 through 8 years of age:** First: 0.5 mL Intranasally (1/2 dose in each nostril) Second:* 0.5 mL Intranasally (1/2 dose in each nostril) 6-10 weeks later * A second dose of influenza vaccine is recommended for children less than 9 years of age who are receiving influenza vaccine for the first time. **Persons 9 through 49 years of age:** First: 0.5 mL Intranasally (1/2 dose in each nostril)	Yearly booster of influenza vaccine prepared for current flu season, early in the fall	LAIV can be used to immunize healthy persons 5 through 49 years of age. Currently the vaccine is **no**t licensed for use in persons who are at high-risk for influenza complications, including pregnant women. High-risk persons should receive Inactivated influenza vaccine. See Influenza Virus Vaccine Subviron Comments for listing of persons considered high-risk for influenza complications. Healthcare workers and others who have contact with hematopoietic stem cell transplant patients while they are in isolation should not receive LAIV because of theoretical risk that the attenuated vaccine might be transmitted to the severely immunosuppressed person and cause disease. Persons who receive LAIV should refrain from contact with persons in isolation for hematopoietic stem cell transplant for 7 days. **Adverse Reactions:** Cough, runny nose, nasal congestion, sore throat, chills. Rarely hypersensitivity reactions. **Contraindications:** Children aged 5 through 17 years receiving aspirin therapy due to the association of Reye syndrome with aspirin therapy and wild-type influenza infection. Persons with a history of Guillain-Barré syndrome; immunosuppression from disease or therapy; history of asthma or reactive airways disease; anaphylactic reaction to eggs or to other vaccine components (see package insert for details).

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Influenza Virus Vaccine Subvirion (Split) **Fluzone®** Sanofi Pasteur (FDA approved for persons age ≥6 months) **Fluvirin®** Novartis Vaccine (FDA approved for persons age ≥4 years) **Fluarix®** GlaxoSmithKline (FDA approved for persons age ≥18 years) FluLaval™ GlaxoSmithKline (FDA approved for persons age ≥18 years)	**Persons 6 months and over:** **6 months through 35 months** First: 0.25 mL Second: 0.25 mL one month later **3 years through 8 years:** First: 0.5 mL IM Second: 0.5 mL IM one month later * A second dose of influenza vaccine is recommended for infants and children (<9 years of age) receiving influenza vaccine for the first time. **Persons 9 years of age and over:** First: 0.5 mL IM	Yearly booster of vaccine prepared for current flu season, early in the fall	Influenza vaccine is recommended for the following groups: • All persons 50 years of age or older • All children 6-59 months of age • Residents of long-term care facilities • Persons 6 months of age and older with a chronic illness: o pulmonary illnesses, such as emphysema, chronic bronchitis, or asthma o cardiovascular illnesses, such as congestive heart failure o metabolic diseases, including diabetes mellitus o renal dysfunction o hemoglobinopathy, such as sickle cell disease o **i**mmunosuppression, including human immunodeficiency virus (HIV) infection o any condition (e.g., cognitive dysfunction, spinal cord injury, seizure disorder, or other neuromuscular disorder) that can compromise respiratory function or the handling of respiratory secretions • Persons 6 months to 18 years of age receiving chronic aspirin therapy (because of the risk of Reye syndrome following influenza infection) • Women who will be pregnant during influenza season • Persons who have contact with high-risk persons: o healthcare workers o employees of long-term care facilities o household contacts of high-risk persons o household contacts and other caregivers of children younger than 59 months of age • Persons who provide essential community services and students or others in institutional settings (e.g., schools and colleges) may be considered for vaccination to minimize disruption of routine activities during outbreaks • Persons traveling outside the United States should consider influenza vaccination **Adverse Reactions:** Soreness, erythema, and induration at the site of injection; fever, chills, malaise, and myalgia, are reported in fewer than 1% (most often affects persons who have had no exposure to the influenza virus antigens in the vaccine, e.g., young children); although unclear, the risk of Guillain-Barré Syndrome (GBS) may be slightly increased; rarely, immediate hypersensitivity reactions (such as hives, angioedema, allergic asthma, or systemic anaphylaxis). **Contraindications:** severe allergic reaction to a prior dose of inactivated influenza vaccine, or to a vaccine component (e.g., eggs); moderate or severe acute illness until symptoms have decreased.

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Japanese Encephalitis Vaccine Inactivated JE-VAX® Sanofi Pasteur	**Children 1 through 2 years of age:** First: 0.5 mL SC Second: 0.5 mL SC 7 days later Third: 0.5 mL SC 30 days after first dose* **Persons 3 years of age and over:** First: 1.0 mL SC Second: 1.0 mL SC 7 days later Third: 1.0 mL SC 30 days after first dose* * An abbreviated schedule of 0, 7, and 14 days may be used when the longer schedule is impractical because of time constraints. The last dose should be given at least 10 days before travel to ensure an adequate immune response and access to health care in the event of delayed adverse reactions.	0.5 mL SC after 2 years 1.0 mL SC after 2 years	Indicated only for persons spending 1 month or longer in endemic areas (which include China, Japan, Korea, and Eastern Russia), especially rural areas, during the transmission season. Depending on the epidemic circumstances, vaccine should be considered for persons spending less than 30 days whose activities, such as extensive outdoor activities in rural areas, place them at particularly high risk for exposure. Current CDC advisories should be consulted with regard to JE epidemicity in specific locales. Advise travelers to take personal precautions to reduce exposure to mosquito bites. Personal precautions include, the use of insect repellents, and protective clothing. Avoiding outdoor activity, especially during twilight periods and in the evening, will reduce risk even further. **Adverse Reactions:** Moderate frequency of local and mild systemic side effects. Injection site tenderness, redness, swelling and other local effects have been reported in about 20% of vaccinees (< 1% to 31%). Systemic side effects, principally fever, headache, malaise, rash, and other reactions, such as chills, dizziness, myalgia, nausea, vomiting, and abdominal pain have been reported in approximately 10% of vaccinees. However, more severe systemic side effects which can include angioedema of the extremities, face, and oropharynx, especially of the lips, and hypertension, can occur up to 17 days (usually within 10 days) of receipt of vaccine (About 60 per 10,000 people vaccinated have had allergic reactions to JE vaccine.). Other severe problems, such as seizures or nervous system problems, have been reported; these are rare (probably less than 1 per 50,000 people vaccinated). **Contraindications:** Anaphylactic reaction to previous dose of vaccine, or severe hypersensitivity to any component of the vaccine, especially proteins of rodent or neural origin. Vaccine contains thimersol.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Measles Virus Vaccine Live Attenuvax® Merck	**Children 12 months through 18 years:** First: 0.5 mL SC* Second: 0.5 mL SC* at 4-6 years of age, or at least 4 weeks after the first dose **Persons 19 years of age and over**:** First: 0.5 mL SC* * To reconstitute the vaccine: Withdraw the entire contents of the diluent vial into a syringe. Inject all of the diluent in the syringe into the vial of lyophilized vaccine and gently agitate to mix thoroughly. Withdraw the entire contents into a syringe and inject the total volume of reconstituted vaccine subcutaneously (SC). ** A second dose of measles-containing vaccine (at least four weeks after the first dose) is recommended for persons attending colleges and other post-high school educational institutions, persons born in 1957 or later working in medical facilities, and international travelers	Not established	The Advisory Committee on Immunization Practices (ACIP) recommends that a combination vaccine (MMR or MMRV) be used when any of the individual components is indicated (and for MMRV, if the vaccinee is 12 months through 12 years of age). The following groups should be considered unvaccinated and should receive at least one dose of measles vaccine: persons 1) vaccinated before the first birthday, 2) vaccinated with killed measles vaccine (KMV), 3) vaccinated with KMV followed by live vaccine less than 4 months after the last dose of KMV, 4) vaccinated before 1968 with an unknown type of vaccine (the vaccine may have been KMV), or 5) vaccinated with IG in addition to a further attenuated strain or vaccine of unknown type. (Revaccination is not necessary if IG was given with Edmonston B vaccine.) See note on timing of TB skin testing in comments section for MMR vaccine. **Adverse Reactions:** Fever of 103° F (39° C) beginning 5-12 days after vaccination (5%-15%) and/or transient rashes (5%). Clinically apparent thrombocytopenia occurs rarely within 2 months after vaccination. Encephalitis and encephalopathy occur approximately once per million doses. Allergic reactions are rare; anaphylaxis is extremely rare. **Contraindications:** • History of a severe allergic reaction (i.e., hives, swelling of the mouth or throat, difficulty breathing, hypotension, shock) following a prior dose of measles vaccine or to a vaccine component (e.g., gelatin, neomycin) • Women known to be pregnant should not receive measles vaccine. Pregnancy should be avoided for 4 weeks following measles vaccine • Persons who are immunosuppressed or immunodeficient, including congenital immunodeficiency, leukemia, lymphoma, generalized malignancy, severe immunosuppression from HIV infection or therapy with alkylating agents, antimetabolites, radiation. Persons receiving large dose of corticosteroids (i.e., 2 mg/kg or more per day or 20 mg or more per day of prednisone) for 14 days or more should not receive a measles-containing vaccine. Avoid measles-containing vaccine for at least one month after discontinuing high dose therapy. Persons with leukemia in remission who have received chemotherapy for at least 3 months may receive a measles-containing vaccine. Measles-containing vaccine (MMR) is recommended for all asymptomatic HIV-infected persons, and should be considered for symptomatic persons who are not severely immunosuppressed. • Receipt of antibody-containing blood products (e.g., immune globulin, whole blood, or packed red blood cells). See Table 2 to determine the recommended interval between administration of a blood product or immune globulin and a measles-containing vaccine. • Moderate or severe acute illness until improved

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Measles, Mumps and Rubella Virus Vaccine, Live (MMR) MMR II® Merck	**Persons 12 months through 18 years:** First: 0.5 mL SC* Second: 0.5 mL SC* at 4-6 years of age, or at least 4 weeks after the first dose **Persons 19 years of age and over**:** First: 0.5 mL SC* * To reconstitute the vaccine: Withdraw the entire contents of the diluent vial into a syringe. Inject all of the diluent in the syringe into the vial of lyophilized vaccine and gently agitate to mix thoroughly. Withdraw the entire contents into a syringe and inject the total volume of reconstituted vaccine subcutaneously (SC). ** For persons entering college, other post high school educational institutions, or for health care workers born in 1957 or later, a second dose (0.5 mL SC) is recommended at least four weeks after the first dose.	Not established.	MMR is preferred over the individual component vaccines for most older children and adults. MMRV is the preferred vaccine for children 12 months through 12 years of age. Persons vaccinated with measles vaccine before the first birthday or who were vaccinated before 1968 should be considered unvaccinated. See individual component vaccines for recommendations for who should be vaccinated. **Tuberculin tests:** Measles-containing vaccines can interfere with the response to a tuberculin test. Tuberculin testing, if otherwise indicated, can be done on either the same day that a measles-containing vaccine is administered or 4-6 weeks later. **Adverse Reactions:** Fever of 103° F (39° C) beginning 5-12 days after vaccination (5% to 15%) and/or transient rashes (5%). Clinically apparent thrombocytopenia occurs rarely within 2 months after vaccination. Transient lymphadenopathy sometimes occurs and parotitis has been reported after receipt of MMR. Arthralgias and other joint symptoms are reported in up to 25% of susceptible adult women given MMR vaccine (related to the rubella component of the vaccine). Allergic reactions are rare after MMR. **Contraindications:** • Persons who have experience a severe allergic reaction (i.e., hives, swelling of the mouth or throat, difficulty breathing, hypotension, shock) following a prior dose or to a vaccine component (e.g., gelatin, neomycin) • Women known to be pregnant (Pregnancy should be avoided for 4 weeks following MMR vaccine.) • Persons who are immunosuppressed or immunodeficient, including congenital immunodeficiency, leukemia, lymphoma, generalized malignancy, severe immunosuppression from HIV infection or therapy with alkylating agents, antimetabolites, radiation. Persons receiving large dose of corticosteroids (i.e., 2 mg/kg or more per day or 20 mg or more per day of prednisone) for 14 days or more should not receive MMR. Avoid MMR for at least one month after discontinuing of high dose therapy. Persons with leukemia in remission who have not received chemotherapy for at least 3 months may receive MMR. MMR is recommended for all asymptomatic HIV-infected persons, and should be considered for symptomatic persons who are not severely immunosuppressed. • Receipt of antibody-containing blood products (e.g., immune globulin, whole blood or packed red blood cells) may interfere with seroconversion to measles vaccine. See table 2, page 5 to determine the recommended interval between administration of a blood product or immune globulin and a measles-containing vaccine. • History of thrombocytopenia within 6 weeks of a previous dose of a measles or rubella-containing vaccine • Moderate or severe acute illness until illness improves or resolves

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Measles, Mumps, Rubella and Varicella Virus Vaccine Live (MMRV) ProQuad® Merck	**Children 12 months to 12 years:** **Dose 1:** **0.5 mL SC*** **Dose 2:** **0.5 mL SC* at 4-6 years of age, or at least 3 months after the first dose**** * To reconstitute the vaccine: Withdraw the entire contents of the diluent vial into a syringe. Inject all of the diluent in the syringe into the vial of lyophilized vaccine and gently agitate to mix thoroughly. Withdraw the entire contents into a syringe and inject the total volume of reconstituted vaccine subcutaneously (SC). ** If the second dose of varicella-containing vaccine is inadvertently administered at least 28 days following the first dose, the second dose does not need to be repeated.	None	At least one month should elapse between a dose of measles-containing vaccine (e.g., MMR) and a dose of MMRV vaccine. For children aged <13 years at least 3 months should elapse between two doses of varicella-containing vaccine. Use the component vaccines (MMR and varicella vaccine) when vaccinating HIV-infected children (not MMRV). If TB skin testing is to be done, administer it before, simultaneously, or at least 4 weeks after MMRV. If a vaccinated child develops a rash, close contact with persons who do not have evidence of varicella immunity and who are at high risk of complications of varicella, such as immunocompromised persons, should be avoided until the rash has resolved. **Adverse Reactions:** Fever (21.5%), pain at the injection site, varicella-like rash at the injection site, measles-like rash (3.0%) or varicella-like rash (4%-6%), thrombocytopenia (low platelet count) has rarely been associated with MMR vaccine, lymphadenopathy sometimes occurs following receipt of MMR or other rubella containing vaccine temporary pain and stiffness in the joints following receipt of MMR or other rubella-containing vaccine, parotitis has rarely been reported following receipt of MMR or other mumps-containing vaccine, zoster caused by varicella vaccine virus has been reported **Precautions:** • Postpone vaccination of persons with moderate or severe acute illnesses until the condition has improved • Do not administer for 3-11 months after receipt of antibody containing blood products (see table 2, page 5)· • History of thrombocytopenia • Tuberculosis patients with active untreated disease should initiate treatment before receiving MMRV • Avoid the use of salicylates for 6 weeks after vaccination due to the association between wild varicella zoster infection, salicylates, and Reye syndrome **Contraindications:** • History of anaphylactic reaction to a prior dose of a measles, mumps, rubella, or varicella-containing vaccine, or to any component of the vaccine, including gelatin and neomycin • Altered immune status due to: malignant condition (blood dyscrasia, leukemia*, lymphoma, or other neoplasms affecting the bone marrow or lymphatic system); cellular immunodeficiency; family history of congenital or hereditary immunodeficiency, unless immune competence of possible vaccine recipient is demonstrated; and individuals receiving immunosuppressive therapy, including large doses of corticosteroids (i.e., prednisone or equivalent at a dose of > 2 mg/kg of body weight per day or 20 mg/day) • Pregnancy *If a child with leukemia is in remission and not immunosuppressed, and needs all four components, MMRV may be used.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Meningococcal (Groups A, C, Y, & W-135) Polysaccharide Diphtheria Toxoid Conjugate Vaccine (MCV4) Menactra® Sanofi Pasteur	**Adolescents and Adults 11-55 years of age:** First: 0.5 mL IM	Booster schedule not established 0.5 mL IM if indicated See Comments and Contraindications Section for revaccination recommendations	**Revaccination:** Consider revaccination with MCV4 within 3-5 years for persons aged 11 years and over previously vaccinated with Meningococcal Polysaccharide Vaccine who remain high risk for meningococcal disease (i.e., those with terminal complement deficiency, with anatomic or functional asplenia, those infected with HIV, travelers to hyper-endemic or epidemic areas) The vaccine is indicated for persons 11 through 55 years of age: • Children aged 11-12 at their preadolescent visit and teens (age 15) entering high school if not vaccinated at the preadolescent visit • Persons at increased risk for meningococcal disease, including: o Travelers to countries in which N. meningitides is hyper-endemic or epidemic, particularly if contact with the local population will be prolonged; o Those who have terminal complement deficiencies and those with anatomic or functional asplenia, o Those infected with HIV; o Military recruits; o Research, industrial, and clinical laboratory workers who are routinely exposed to N. meningitidis in solutions that may be aerosolized; o College freshmen living in dormitories. No vaccine is available for the prevention of serogroup B disease which accounts for one-third of meningococcal cases. **Adverse Reactions:** The most commonly reported adverse reactions are local pain, headache, and fatigue. Other adverse reactions include local redness, swelling and induration, malaise, arthralgia. A few cases of Guillain-Barré Syndrome (GBS) have been reported among people who got MCV4. There is not enough evidence yet to tell whether the vaccine caused them. **Contraindications:** Known hypersensitivity to any component of the vaccine including diphtheria toxoid, or a life-threatening reaction after previous administration of a vaccine containing similar components are contraindications to vaccine administration. Acute moderate or severe illness contraindicates vaccination until illness improves. No data are available on the safety of MCV during pregnancy. However, pregnancy is not considered to be a contraindication to MCV4. Persons with a history of GBS should not be vaccinated with MCV4 unless they are at elevated risk for meningococcal disease.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Meningococcal Vaccine, Inactivated Polyvalent Polysaccharide (MPSV) Menomune® A/C/Y/W-135 Sanofi Pasteur	**Selected children 2 years of age and over and adults** First: 0.5 mL SC	0.5 mL SC if indicated (See Revaccinations under Comments and Contraindications)	For persons 11-55 years of age use of Meningococcal Conjugate Vaccine is preferred as it is expected to provide longer lasting protection. No vaccine is available for the prevention of serogroup B disease which accounts for one-third of meningococcal cases. **Revaccination:** Revaccination may be indicated for persons previously vaccinated with MPSV who remain at increased risk for infection, particularly for children who were first vaccinated when they were younger than 4 years of age. Such children should be considered for revaccination after 2–3 years if they remain at high risk. Although the need for revaccination of older children and adults after receiving MPSV has not been determined, if indications still exist for vaccination, revaccination may be considered 5 years after receipt of the first dose. Meningococcal Conjugate Vaccine (MCV4) is recommended for revaccination of persons 11–55 years of age. However, use of MPSV is acceptable. Vaccine is routinely indicated for high-risk groups such as individuals with terminal complement component deficiencies, those with functional or anatomic asplenia, HIV infected persons, and travelers to areas where meningococcal disease is endemic, particularly if contact with the local population will be prolonged. The vaccine may be indicated for those at high risk for exposure, for example, during epidemics disease or in military encampments. ACIP recommends vaccination of college freshmen living in dormitories. Research, industrial, and clinical laboratory workers who are routinely exposed to N meningitidis in solutions that may be aerosolized also should consider vaccination. **Adverse Reactions:** Localized pain and erythema at injection site. Up to 3% of recipients, develop transient fever. Systemic reactions such as headache and malaise are reported in 2-5% of recipients. **Contraindications:** Hypersensitivity to any vaccine component contraindicates vaccination. Moderate or severe acute illness contraindicates vaccination until illness improved.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Mumps Virus Vaccine, Live MUMPSVAX® Merck	**Persons 12 months and older:** First: 0.5 mL SC* * If a second dose of mumps vaccine is indicated (see comments) administer it at least 1 month after the first dose (0.5 mL SC) To reconstitute the vaccine: Withdraw the entire contents of the diluent vial into a syringe. Inject all of the diluent in the syringe into the vial of lyophilized vaccine and gently agitate to mix thoroughly. Withdraw the entire contents into a syringe and inject the total volume of reconstituted vaccine subcutaneously (SC).	Not established	**Acceptable Presumptive Evidence of Mumps Immunity Through Documentation of Adequate Vaccination:** Documentation of adequate vaccination is now (as of June 2006) defined as 1 dose of a live mumps virus vaccine for preschool-aged children and adults not at high risk and 2 doses for school-aged children (i.e., grades K--12) and for adults at high risk (i.e., health-care workers, international travelers, and students at post--high school educational institutions). **Routine Vaccination for Health-Care Workers:** Persons born during or after 1957 without other evidence of immunity: 2 doses of a live mumps virus-containing vaccine. Persons born before 1957 without other evidence of immunity: consider recommending 1 dose of a live mumps virus-containing vaccine. **For Outbreak Settings:** Children aged 1-4 years and adults at low risk: if affected by the outbreak, consider a second dose of live mumps virus-containing vaccine. Health-care workers born before 1957 without other evidence of immunity: strongly consider recommending 2 doses of live mumps virus-containing vaccine. The first dose of mumps-containing vaccine should be administered on or after the first birthday; the second dose should be administered no earlier than 1 month (i.e., at a minimum of 28 days) after the first dose. MMR vaccine generally should be used whenever any of its component vaccines are indicated. For children aged 12 months-12 years, combined measles, mumps, rubella, and varicella (MMRV) vaccine can be considered if varicella vaccination is also indicated. **Post Exposure Vaccination:** There is no conclusive evidence that vaccination of individuals recently exposed to natural mumps will provide protection. **Adverse Reactions:** Parotitis and fever have been reported rarely. Although rare cases of CNS dysfunction, including deafness, have been reported within 2 months of mumps vaccination, there is inadequate evidence to prove a causal relationship. Allergic reactions, including rash, pruritus, and purpura, have been temporally associated with vaccination, but these are transient and generally mild. **Contraindications:** Persons with a history of anaphylaxis following exposure to neomycin or to gelatin; pregnancy; persons with impaired immune systems such as leukemia, lymphoma, generalized malignancy, immune deficiency disease, or immunosuppressive therapy. Treatment with low dose (<2 mg/kg/day) or alternate day prednisone, or topical or aerosolized steroid preparations is not a contraindication to mumps vaccination. Mumps vaccine should be given two weeks before, or deferred for at least 3 months following administration of an antibody-containing blood product if administered as MMR or MMRRV (see Table 2, page 3). Persons with a moderate or severe illness should not be vaccinated until illness improves or resolves.

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Pneumococcal Conjugate Vaccine (PCV)
 	
Prevnar™
Wyeth
	The number of doses recommended depends on the age of the infant or child when beginning the series:
	
	Age at first dose: — Schedule (Dose 0.5 mL IM)
	2*-6 months — 3 doses, 2 months apart[§]
	7-11 months — 2 doses, 2 months apart[§]
	12-23 months — 2 doses 2 months apart[¶]
	24-59 months
	Healthy children — 1 dose
	High-risk children — 2 doses, 2 months apart (See comments)
	
	* Minimum age is 6 weeks of age
	§ For children vaccinated at age < 1 year, minimum interval between doses is 4 weeks (6 to 8 weeks preferred by the AAP)
	¶ Minimum interval between doses is 8 weeks
		Additional Dose: (Dose: 0.5 mL IM)
		1 dose at 12-15 months[†]
		1 dose at 12-15 months[†]
		none
		
		none
		none
			Pneumococcal conjugate vaccine (PCV) is recommended for:
			• All children younger than 24 months
			• Unimmunized children aged 24-59 months with the one of the following high-risk conditions (2 doses recommended):
			  • sickle cell disease and other sickle cell hemoglobinopathies, congenital or acquired asplenia, or splenic dysfunction
			  • infection with human immunodeficiency virus (HIV)
			  • immunocompromising conditions, including congenital immunodeficiencies (B-lymphocyte [humoral] or T-lymphocyte deficiency); complement deficiencies, particularly c1, c2, c3, and c4 deficiency; and phagocytic disorders, (excluding chronic granulomatous disease); renal failure and nephritic syndrome; diseases associated with immunosuppressive therapy or radiation therapy, including malignant neoplasms, leukemias, lymphomas, and Hodgkin's disease, or solid organ transplantation
			  • chronic illnesses, including chronic cardiac disease, particularly cyanotic congenital heart disease and cardiac failure; chronic pulmonary disease (excluding asthma unless on high-dose corticosteroids therapy); cerebrospinal fluid leaks; diabetes mellitus; cochlear implant recipients
			
			In addition, one dose of PCV should be considered for:
			• All unimmunized healthy children aged 24-59 months of age, with priority given to:
			  • children aged 24-35 months
			  • children of Alaskan Native or American Indian descent
			  • children of African American descent
			  • children who attend group day care centers for 4 or more hours per week
			
			Adverse Reactions: Injection site redness and/or soreness. Local reactions are more common with the fourth dose than with the first three doses. No severe adverse events attributable to PCV7 have been reported.
			
			Contraindications: History of a serious allergic reaction to a prior dose of PCV or to a vaccine component, including diphtheria toxoid. .Acute moderate to severe illness until illness improved.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Pneumococcal Vaccine (Polyvalent, inactivated) (PPV23) PNEUMOVAX® 23 Merck	**Selected children 2 years of age and older and high-risk adults (see comments)** First: 0.5 mL IM or SC as a single dose	Revaccination not routinely recommended. See comments for list of persons for whom a second dose of PPV23 is recommended and for the timing of that dose. Dose: 0.5 mL IM or SC	Children 24-59 months of age who have already received one or more doses of PCV7 and who are at high risk of invasive pneumococcal disease (see below) should be given PPV23 (no sooner than 2 months after the last dose of PCV7). **PPV23 is recommended for the following groups:** **Immunocompetent persons:** Persons aged 65 years and older; persons aged 2-64 years with chronic cardiovascular disease, chronic pulmonary disease, or diabetes mellitus; persons 2-64 with alcoholism, chronic liver disease, or cerebrospinal fluid leaks; person 2-64 with a cochlear implant, persons 2-64 with functional or anatomic asplenia (including sickle cell disease and splenectomy: persons 2-64 years living in special environments or social settings (including Alaskan Natives and certain American Indian populations [Arizona, New Mexico, and Navajo populations in Colorado and Utah]). **Immunocompromised persons:** Persons age 2 years and over, including those with HIV infection, leukemia, lymphoma, Hodgkin's disease, multiple myeloma, generalized malignancy, chronic renal failure, or nephritic syndrome, those receiving immunosuppressive chemotherapy (including corticosteroids); and those who have received an organ or bone marrow transplant. **Revaccination:** Revaccination is recommended for persons 2 years of age and older who are at highest risk for serious pneumococcal infection and for those who are likely to have a rapid decline in pneumococcal antibody levels. Only one PPV23 revaccination dose is recommended for high-risk persons. The second dose should be administered 5 or more years after the first dose. Revaccination 3 years after the previous dose may be considered for children at highest risk for severe pneumococcal infection who would be 10 years of age or less at the time of revaccination, including children who received PCV7. Persons at highest risk include all persons 2 years of age and older with functional or anatomic asplenia (e.g., from sickle cell disease or splenectomy), HIV infection, leukemia, lymphoma, Hodgkin disease, multiple myeloma, generalized malignancy, chronic renal failure, nephrotic syndrome, or other conditions associated with immunosuppression (e.g., organ or bone marrow transplantation) and those receiving immunosuppressive chemotherapy, including long-term corticosteroids. Persons aged 65 years and older should be administered a second dose of pneumococcal vaccine if they received the vaccine more than 5 years previously, and were younger than 65 years of age at the time of the first dose. **Adverse Reactions:** Pain, swelling or erythema at the injection site; moderate systemic reactions (such as fever and myalgia) are not common (<1%), and more severe systemic adverse reactions are rare. **Contraindications:** Pregnancy, unless high-risk. History of severe hypersensitivity to a prior dose or to thimersol. Moderate or severe illness until condition improved.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Poliovirus Vaccine, Enhanced Potency Inactivated (Salk Vaccine e-IPV) IPOL™ Sanofi Pasteur	**Children 6 weeks through 17 years*:** First: 0.5 mL SC or IM Second: 0.5 mL SC or IM 6-8 weeks after the first dose Third: 0.5 mL SC or IM 2-8 months after second dose *The minimum interval between doses of IPV is 4 weeks, although the preferred interval between the second dose and third dose is 2-8 months for children. **Persons 18 years of age and older**:** (See comments) First: 0.5 mL SC or IM Second: 0.5 mL SC or IM 1-2 months after first dose Third: 0.5 mL SC or IM 6-12 months after second dose **** Accelerated schedule:** **8 or more weeks before protection is needed:** Three doses of IPV should be given at least 4 weeks apart. **4-8 weeks before protection is needed:** Two doses of IPV should be given at least 4 weeks apsrt. **Less than 4 weeks before protection is needed:** One dose of IPV. Give remaining doses of vaccine at the recommended intervals if the person remains at risk.	Fourth 0.5 mL SC or IM at 4-6 years of age (school entry)[§] [§] The minimum age for the fourth dose is 18 weeks. The fourth dose is not needed if the third dose is given on or after the fourth birthday. If all four IPV doses are administered after 6 weeks of age and are all separated by at least 4 weeks, a fifth dose is not needed, even if the fourth dose was administered before 4 years of age None[¶] [¶] Adults who have had the primary series of OPV or IPV and who are at increased risk can receive another dose of IPV (0.5 mL SC or IM). Additional booster doses are not indicated.	Only IPV is available for routine polio vaccination of children in the United States. A polio vaccination schedule begun with OPV should be completed with IPV. If a child receives both types of vaccine, four doses of any combination of IPV or OPV by 4-6 years of age is considered a complete poliovirus vaccination series. A minimum interval of 4 weeks should separate all doses of the series. **Adults:** Routine polio vaccination of adults (18 years of age and older) in the United States is not indicated. Unvaccinated adults (including adults without a written record of prior polio vaccination) at special risk of exposure to wild polio virus, including travelers to endemic areas (currently limited to South Asia, the eastern Mediterranean, and Africa) or communities experiencing disease (e.g., an outbreak), laboratory workers handling polio virus, and health-care workers in close contact with patients excreting polio virus should be immunized with IPV. **Adverse Reactions:** Minor local reactions (pain, redness) may occur following IPV. No serious side effects to e-IPV have been documented. Because IPV contains trace amounts of streptomycin, polymyxin B and neomycin, hypersensitivity reactions may occur in persons sensitive to these antibiotics. **Contraindications:** History of an anaphylactic reaction to a previous dose of IPV or to a component of the vaccine, including streptomycin, polymyxin B, or neomycin. Moderate of severe acute illness is a precaution for IPV until condition improves.

IMMUNOBIOLOGICS

IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Poliovirus Vaccine, Live, Oral, Trivalent (Sabin Vaccine, OPV) ORIMUNE® Wyeth	Consult Immunization Program or CDC for dose, interval and frequency recommendations during outbreak control.	Dose: 0.5 ml SC or IM when recommended as part of outbreak control	OPV is no longer routinely available in the United States; however, CDC maintains an emergency stockpile of OPV for polio outbreak control. The preference for OPV for outbreak control is supported by (a) higher seroconversion rate after a single dose of OPV compared to a single dose of IPV; (b) greater degree of intestinal immunity, which limits the community spread of wild poliovirus; and (c) beneficial secondary spread (intestinal shedding) of vaccine virus, which improves overall protection in the community. Also OPV replicates in the intestinal tract and induces antibodies in more recipients after a single dose. Boosting or immunity with a single dose of OPV or IPV is likely to reduce both pharyngeal and intestinal excretion of poliovirus, effectively stopping epidemic transmission of poliovirus. The ACIP supports the global polio eradication initiative and the use of OPV as the only vaccine recommended to eradicate polio from the remaining countries where polio is endemic. **Adverse Reactions:** Rarely causes vaccine-associated paralytic poliomyelitis (VAPP). The risk of VAPP is 1 case to 750,000 first doses of OPV distributed or an overall risk of 1 case per 2.4 million doses distributed. From 1980 through 1998, 152 cases of paralytic polio were reported in the United States; 144 (95%) of these cases were VAPP, and the remaining eight were in persons who acquired documented or presumed wild-virus polio outside the United States. Of the 144 VAPP cases, 59 (41%) occurred in healthy vaccine recipients (average age 3 months). Forty-four (31%) occurred in healthy contacts of vaccine recipients (average age 26 years), and 7 (5%) were community acquired (i.e., vaccine virus was recovered but there was no known contact with a vaccine recipient). Thirty-four (24%) of VAPP cases occurred in persons with immunologic abnormalities (27 in vaccine recipients and 7 in contacts of vaccine recipients). None of the vaccine recipients were known to be immunologically abnormal prior to vaccination. Immunodeficient persons, particularly those with agammaglobulinemia and hypogammaglobulinemia, are at greatest risk for VAPP. **Contraindications:** Immunodeficiency diseases, including HIV infection, agammaglobulinemia and hypogammaglobulinemia; altered immune states such as leukemia, lymphoma, or generalized malignancy; steroids, alkylating drugs, antimetabolite therapy; household contacts of the above-described individuals; pregnancy (theoretical risk) unless immediate protection is needed, e.g., outbreak situation.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Rabies Vaccine Human diploid cell vaccine (HDCV) Imovax® Rabies Sanofi Pasteur Rabies vaccine absorbed (RAV) BioRav® Bio Port Corp. Purified chick embryo cell vaccine (PCEC) RabAvert® Novartis Vaccines	**Post-exposure vaccination:** Persons not previously immunized*: First: 1.0 mL IM on day 0 Second: 1.0 mL IM on day 3 Third: 1.0 mL IM on day 7 Fourth: 1.0 mL IM on day 14 Fifth: 1.0 mL IM on day 28 * Persons not previously immunized should receive rabies immune globulin (20 IU/kg body weight) with the first dose of vaccine. Persons previously immunized: First: 1.0 mL IM on day 0 Second: 1.0 mL IM on day 3 **Pre-exposure vaccination:** First: 1.0 mL IM on day 0 Second: 1.0 mL IM on day 7 Third: 1.0 mL IM on day 21 or 28 NOTE: Do not inject vaccine into the gluteal area as this may result in lower neutralizing antibody.	Dose: 1.0 mL IM **Continuous risk** (see comments)**:** Check serologic titers to rabies every 6 months and give booster when antibody titer drops below acceptable level. Acceptable antibody level $\geq$ 1:5 titer on the rapid fluorescent focus inhibition test (RFFIT). **Frequent risk** (see comments)**:** Check serology or give booster every two years. **Infrequent risk** (see comments)**:** None	Pre-exposure vaccination dose not eliminate the need for additional therapy after a rabies exposure but simplifies post-exposure treatment by eliminating the need for rabies immune globulin and decreasing the number of doses of vaccine required. Pre-exposure vaccination recommended for persons at high risk of exposure including, veterinarians, animal handlers, field biologist, spelunkers and certain laboratory workers. Vaccination of persons at moderate risk of exposure including international travelers visiting for extended periods in foreign countries where canine rabies is endemic (including areas of Mexico, El Salvador, Guatemala, Peru, Columbia, Ecuador, India, Nepal, Philippines, Sri Lanka, Thailand, Vietnam, and some parts of Africa and Asia should be considered. Also, vaccination recommended for persons at high risk of exposure in countries where required therapy may be delayed. **Continuous risk:** Persons who work with live rabies virus in research laboratories or vaccine production facilities. **Frequent risk:** Other laboratory workers such as those doing rabies diagnostic testing, spelunkers, veterinarians and staff, animal-control and wildlife officers working in areas where rabies is epizootic, and international travelers living or visiting (for >30 days) in areas where canine rabies is endemic. **Infrequent risk:** Veterinarians and animal-control and wildlife officers working in areas of low rabies enzooticity do not require routine boosters after completion of the full pre-exposure vaccine series. **Adverse Reactions:** Local reactions such as pain, erythema, swelling or itching at the injection site. Systemic reactions include malaise, headache, nausea, abdominal pain, muscle aches and dizziness. Approximately 6% of persons receiving booster doses have a delayed hypersensitivity reactions. **Contraindications:** For post-exposure prophylaxis, there are no contraindications. For pre-exposure vaccination, anaphylactic reaction to any of the vaccine components (see package insert for individual vaccine), or after a prior dose. Usually, one of the other rabies vaccines can be used to complete the series. Patients who are immunosuppressed by disease or medication should postpone pre-exposure vaccination and consider avoiding activities for which pre-exposure vaccination is indicated. If this is not possible, immunosuppressed persons who are at risk for rabies should be vaccinated and their antibody titers checked.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Rotavirus Vaccine, Live, Oral, Pentavalent Rota Teq® Merck	**Infants aged 6 weeks through 32 weeks:** First*: 2 mL Orally (PO) for infants 6 to 12 weeks of age Second**: 2 mL PO 4-10 weeks later Third**: 2 mL PO 4-10 weeks later * The first dose of rotavirus vaccine should be initiated for infants between 6 and 12 weeks of age because of insufficient data on the safety of the first dose of the vaccine in older infants. Do **not** initiate vaccine if infant is 13 weeks of age or older. ** The last dose of rotavirus vaccine should be administered by 32 weeks of age. Do **not** administer a second or third dose if the infant is over 32 weeks of age.	Not established	RotaTeq™ is the only vaccine approved in the United States that can help protect against rotavirus, a viral infection that may cause diarrhea, vomiting, fever, and dehydration. The vaccine should normally be administered at 2, 4 and 6 months of age. **Adverse Reactions:** The following were reported more often in infants who received rotavirus vaccine when compared to infants who received placebo; diarrhea (24.1 percent in vaccine recipients vs 21.3 percent in those receiving placebo), vomiting (15.2 percent in vaccine recipients vs 13.6 percent in those receiving placebo), ear infection (14.5 percent in vaccine recipients vs 13.0 percent in those receiving placebo), runny nose and sore throat (6.9 percent in vaccine recipients vs 5.8 percent in those receiving placebo), wheezing and coughing (1.1 percent in vaccine recipients vs 0.7 percent in those receiving placebo). **Precautions:** • Acute gastroenteritis: Rotavirus vaccine should not be administered to infants with acute, moderate to severe gastroenteritis until the condition improves. However, infants with mild acute gastroenteritis can be vaccinated, particularly if the delay in vaccination may be substantial and might make the child ineligible to receive vaccine (e.g., older than 12 weeks of age before vaccination is initiated). • Moderate to severe Illness until recovered from the acute phase of the illness. • Preexisting chronic gastrointestinal disease (e.g. congenital malabsorption syndromes, Hirschsprung's disease, short-gut syndrome, or persistent vomiting of unknown cause) • Infants with a previous episode of intussusception. • Altered immunocompetence: Infants with blood dyscrasias, leukemia, lymphomas of any type, or other malignant neoplasms affecting the bone marrow or lymphatic system. Infants on immunosuppressive therapy (including high-dose systemic corticosteroids). Infants with primary and acquired immunodeficiency states, including HIV/AIDS or other clinical manifestations of infection with human immunodeficiency viruses; cellular immune deficiencies, and hypogammaglobulinemic and dysgammaglobulinemic states. There is insufficient data from the clinical trials to support administration of rotavirus vaccine to infants with indeterminant HIV status who are born to mothers with HIV/AIDS. • Infants who have received a blood transfusion or blood products, including immunoglobulins within 42 days. **Contraindication:** Severe hypersensitivity or anaphylactic reaction to the vaccine or a constituent of the vaccine or after receiving a previous dose of rotavirus vaccine**.**

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Rubella Virus Vaccine, Live MERUVAX®II Merck	**Persons 12 months and older:** First: 0.5 mL SC* * To reconstitute the vaccine: Withdraw the entire contents of the diluent vial into a syringe. Inject all of the diluent in the syringe into the vial of lyophilized vaccine and gently agitate to mix thoroughly. Withdraw the entire contents into a syringe and inject the total volume of reconstituted vaccine subcutaneously.	Not established	MMR vaccine generally should be used whenever any of its component vaccines are indicated. For children aged 12 months-12 years, combined measles, mumps, rubella, and varicella (MMRV) vaccine can be considered if varicella vaccination is also indicated. Consider immune to rubella only if there is documentation of laboratory evidence of rubella immunity or immunization with at least one dose of rubella vaccine on or after the first birthday. Birth before 1957 provides only presumptive evidence of rubella immunity; therefore birth before 1957 is not acceptable evidence of rubella immunity for women who might become pregnant. Administer one dose of a rubella virus-containing vaccine to women whose rubella vaccination history is unreliable and counsel women to avoid becoming pregnant for 4 weeks after vaccination. For women of childbearing age routinely determine rubella immunity and counsel women regarding congenital rubella syndrome. For women who are pregnant and susceptible, vaccinate early in the postpartum period. Vaccine should be administered approximately 2 weeks before or deferred for at least 3 months after receipt of blood products and IG. However, previous administration of anti-Rho (D) IG (human) does not generally interfere with an immune response and is not a contraindication to vaccination. Serologically test these women 6-8 weeks after vaccination to assure that seroconversion has occurred. **Adverse Reactions:** Low-grade fever, rash, and lymphadenopathy. Arthralgia and transient arthritis occur more frequently in susceptible adults (12%-20%) than in children (3%), and more frequently in susceptible postpubertal females (25%) than in susceptible males. **Contraindications:** • Anaphylactic reactions to a prior dose or to neomycin or to gelatin. • Pregnancy and women planning to become pregnant in the next 4 weeks (if pregnant or if becomes pregnant within 4 weeks after vaccination, counsel about the theoretical risk for the fetus, but rubella vaccination during pregnancy ordinarily should not be a reason to consider abortion). • Immunosuppression (e.g., leukemia, lymphoma, generalized malignancy, or resulting from therapy with alkylating agents, antimetabolites, radiation, or large doses of corticosteroid). Patients with leukemia in remission who have not received chemotherapy for at least 3 months may be vaccinated. Short-term (2 weeks), low- or moderate-dose systemic corticosteroid therapy. Topical steroid therapy (e.g., nasal, skin), long-term alternate-day treatment with low to moderate doses of short-acting systemic steroids, and intra-articular, bursal, or tendon injection of corticosteroid do not contraindicate rubella vaccine administration. • Postpone vaccination of persons with acute moderate or severe illness with or without fever until condition improved.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Smallpox Vaccine, Dried, Calf Lymph Type Dryvax® Wyeth	**Persons 18 years or older if indicated*:** First: 2-3 punctures with bifurcated needle into the skin over the deltoid muscle or the posterior aspect of the arm over the triceps muscle** The schedule for smallpox vaccine is one successful dose (i.e., a dose that results in a major reaction at the vaccination site). A vesicular or pustular skin lesion at the site of inoculation 6-8 days postvaccination indicates a successful vaccination, or "take." **Contact the Los Angeles County Immunization Program regarding resources for training on vaccination techniques and guidelines.** *Before the eradication of smallpox, vaccinia vaccination was administered routinely during childhood. However, smallpox vaccination is no longer indicated for infants or children for routine nonemergency indications. In an emergency (postrelease) situation, there would be no age limit for vaccination of persons exposed to a person with confirmed smallpox. **No skin preparation is required. Under no circumstances should alcohol be applied to the skin prior to vaccination as it has been shown to inactivate the vaccine virus.	Persons with occupational exposure to non–highly attenuated vaccinia viruses, recombinant viruses derived from non–highly attenuated vaccinia viruses, or other nonvariola orthopoxviruses should be revaccinated at least every 10 years. To ensure an increased level of protection against more virulent nonvariola orthopoxviruses (e.g., monkeypox), empiric revaccination every 3 years can be considered. Dose: 15 punctures with bifurcated needle into the skin over the deltoid muscle or the posterior aspect of the arm over the triceps muscle Revaccination is considered successful if a vesicular or pustular lesion is present or an area of definite palpable induration or congestion surrounding a central lesion, which may be a scar or ulcer, is present on examination 6-8 days after revaccination.	For routine nonemergency use (i.e., in the absence of smallpox disease) vaccination is recommended for laboratory workers who directly handle cultures or animals contaminated or infected with non–highly attenuated vaccinia viruses, and recombinant vaccinia viruses derived from non–highly attenuated vaccinia strains, for laboratory workers exposed to other orthopoxviruses that infect humans (e.g., monkeypox or cowpox), and consider vaccination for healthcare workers who come into contact with materials such as dressings that may be contaminated with vaccinia or recombinant vaccinia. Vaccination is also recommended for public health, hospital, and other personnel who may need to respond to a smallpox case or outbreak, and for persons who administer the vaccine to others. In the event of an intentional release of variola virus, vaccination would be recommended for those exposed to the initial release, contacts of persons with smallpox, and others at risk of exposure. **Adverse Reactions:** soreness at the vaccination site, swelling and tenderness of regional lymph nodes, local satellite lesions, local edema; fever, malaise, myalgia, and intense erythema ringing the vaccination site, erythematous or urticarial rashes, rarely, d bullous erythema multiforme (or Stevens-Johnson syndrome); inadvertent Inoculation, generalized vaccinia, eczema vaccinatum, vaccinia keratitis, progressive vaccinia, encephalitis or meningoencephalitis, myo/pericarditis, very rarely fetal vaccinia, and rarely death (1-2 deaths per 1,000,000 doses) **Contraindications & Precautions during nonemergency vaccine use:** • History of anaphylactic reaction to a prior dose of vaccine or to any vaccine component, including polymyxin B, streptomycin, chlortetracycline, and neomycin • Immunosuppression (or immunosuppressed household contact) from leukemia, lymphoma, or generalized malignancy; solid organ or stem cell transplantation; and cellular or humoral immunity disorders, including HIV infection. Persons on immunosuppresive therapies, including alkylating agents, antimetabolites, radiation, or high-dose corticosteroid therapy (i.e., prednisone doses of 2 milligrams per kilogram of body weight per day or higher, or 20 milligrams per day or higher for 14 days). • History of a heart condition or anyone with 3 or more of the following 5 risk factors: high blood pressure, high blood cholesterol, diabetes, have a first degree relative who had a heart condition before the age of 50, smoke cigarettes now • Pregnancy or to household contacts of pregnant women • Breastfeeding mothers • Eczema or past history of eczema or for those whose household contacts have eczema • Persons with cute, chronic, or exfoliative skin conditions, (e.g., atopic dermatitis, wounds, burns, impetigo, or varicella zoster) and household contacts of such individuals until the condition is controlled or resolves. • Infants <12 months of age • Moderately or severely illness, defer vaccination until recovered **There are no absolute contraindications regarding vaccination of a person with a high-risk exposure to smallpox.**

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Tetanus and Diphtheria Toxoids, Adsorbed Adult (Td) Generic Td Sanofi Pasteur Decavax™ Sanofi Pasteur Generic Td Massachusetts Biological Laboratories	**Persons 7 years or older (including adults)** First: 0.5 mL IM Second: 0.5 mL IM 4-8 weeks later Third: 0.5 mL IM 6-12 months later	Dose: 0.5 mL IM every 10 years	Tdap is preferred over Td for the adolescent booster dose, and as a single dose for adults 19-64 years of age to replace the next Td booster dose, or in the case of adults who have never received Td (or other tetanus-diphtheria-containing vaccines), Tdap is recommended to be one of the 3 primary doses (preferable the first dose) (see Tdap section). Use Td (or Tdap, if indicated) instead of tetanus toxoid for wound management (see Wound Management in this document). **Diphtheria vaccination for case contacts:** For contacts to a diphtheria case who have received less than three doses of a diphtheria toxoid-containing vaccine, or whose immunization history for diphtheria is unknown, an immediate dose of the appropriate diphtheria toxoid-containing vaccine should be given and the primary series completed according to the appropriate schedule. For contacts who have received three or more doses but who have not received a dose within the previous five years, a booster dose of diphtheria toxoid-containing vaccine is recommended. **Adverse Reactions:** • Local reactions (erythema and induration with or without tenderness). A nodule at the injection site may be palpable for several weeks • Sterile abscess at the injection site has been reported • Exaggerated local (Arthus-like) reactions are occasionally reported following receipt of a diphtheria- or tetanus containing vaccine • Mild systemic reactions such as fever may occur • Brachial neuritis in adult vaccine recipients has been associated with tetanus toxoid-containing vaccines (0.5 to 1 per 100,000 recipients) • Rarely, immediate anaphylactic reactions **Precautions:** • History of Guillain-Barré Syndrome (GBS) within 6 weeks of a prior dose of a tetanus toxoid-containing vaccine as tetanus vaccination has been rarely associated with recurrence of GBS. Vaccination is usually justified for children who have had fewer than 3 doses of a tetanus toxoid-containing vaccine. • History of Arthus-type hypersensitivity reactions or a temperature of > 103ºF (>39ºC) following of tetanus toxoid. These persons usually have high serum antitoxin levels and should not be given doses of td more frequently than every 10 years, even if they have a wound that is neither clean nor minor. **Contraindications:** • A severe allergic reaction (acute respiratory distress or collapse) to a vaccine component or following a prior dose of tetanus toxoid is a contraindication to receipt of tetanus toxoid. If a generalized reaction is suspected to represent allergy, it may be useful to refer an individual for appropriate skin testing before discontinuing tetanus toxoid immunization. • A moderate or severe acute illness is reason to defer routine vaccination until condition improves.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellular Pertussis Vaccine, Adsorbed (Tdap) BOOSTRIX® GlaxoSmithKline ADACEL™ Sanofi pasteur	Tdap vaccines are not licensed for use for the primary series, however, ACIP recommends that for persons aged 11 through 64 years who have not completed the primary series, a single dose of Tdap (0.5 mL IM) be administered in place of one of the Td doses, preferably the first dose.	**Persons 11 through 18 years:** Boostrix or Adacel*: Dose: 0.5 mL IM (see comments) **Persons 19 through 64 years** Adacel***:** Dose: 0.5 mL IM (see comments) * Boostrix is approved for persons 10-18 years of age; Adacel is approved for persons 11-64 years of age.	Adolescents aged 11-18 years should receive a single dose of Tdap instead of Td for booster immunization. The preferred age for the booster Tdap vaccination is at 11-12 years, if 5 years have elapsed since the last dose of DTaP, DTP, or DT. Adolescents aged 11-18 who received Td but not Tdap are encouraged to receive a single dose of Tdap. A 5-year interval between Td and Tdap is encouraged. An interval of less than 5 years can be considered in situations of increased risk of pertussis, such as during a pertussis outbreak, or if protection is desired because of close contact with an infant younger than 6 months of age or a young child who has not been vaccinated against pertussis. Recommendations for vaccination of adults are for a single dose of Tdap to replace a single dose of Td for booster immunization if the most recent tetanus toxoid-containing vaccine was received at least 10 years earlier. Tdap may be given at an interval shorter than 10 years since receipt of the last tetanus toxoid-containing vaccine if necessary to protect against pertussis. Adults who have or who anticipate having close contact with an infant 12 months of age or younger (e.g., parents, child care providers, healthcare providers) should receive a single dose of Tdap. An interval of 2 years or more since the most recent tetanus toxoid-containing vaccine is suggested for these adults; shorter intervals may be used. Ideally, Tdap should be given at least 1 month before beginning close contact with the infant. Women should receive a dose of Tdap in the immediate postpartum period if they have not previously received Tdap. Any woman who might become pregnant is encouraged to receive a single dose of Tdap. Healthcare personnel who work in hospitals or ambulatory care settings and have direct patient contact should receive a single dose of Tdap as soon as feasible if they have not previously received Tdap. Other health-care personnel should receive a single dose of Tdap according to the routine recommendation and interval guidance for use of Tdap among adults. However, these personnel are encouraged to receive the Tdap dose at an interval as short as 2 years following the last Td. **Adverse Reactions:** Erythema and induration with or without tenderness, headache, fatigue, fever may occur. Rarely Arthus reactions, encephalopathy, or Guillain-Barré Syndrome (GBS) occur. **Precautions:** Persons with a progressive neurological disorder, uncontrolled epilepsy, or progressive encephalopathy until a treatment regimen has been established and the condition stabilized; history of an exaggerated local (Arthus-like) reactions; do not give further routine or emergency booster doses of Td more frequently than every 10 years; a history of GBS, within 6 weeks after a previous dose of tetanus toxoid containing vaccine. **Contraindications:** Anaphylactic reaction after a prior dose; encephalopathy not attributable to another identifiable cause within 7 days of vaccination. A moderate or severe acute illness is reason to defer routine vaccination until condition improves.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Tetanus Toxoid Tetanus Toxoid Adsorbed Generic Sanofi Pasteur	**Persons aged 7 years and older:** First: 0.5 mL IM Second: 0.5 mL IM 4-8 weeks later Third: 0.5 mL IM 6-12 months later	0.5 mL IM every 10 years	Combined vaccines against diphtheria, tetanus, and pertussis are preferred for immunizing most children and adolescents; and combined tetanus and diphtheria toxoids (Td) or as a single booster the combined tetanus and diphtheria toxoids-pertussis vaccine (Tdap) are preferred for most adults. Use of Td (or Tdap, if not previously administered) for wound management is preferred (see Wound Management in this document). Note: Use of adsorbed tetanus toxoid is preferred over fluid tetanus toxoid as adsorbed toxoids induce higher antitoxin titers and more persistent antitoxin levels. Fluid tetanus toxoid should be used to immunize the rare patient who is hypersensitive to the aluminum adjuvant in adsorbed tetanus products. **Adverse Reactions:** • Local reactions (erythema and induration with or without tenderness). A nodule at the injection site may be palpable for several weeks • Sterile abscess at the injection site has been reported • Mild systemic reactions such as fever may occur • Brachial neuritis in adult vaccine recipients (.5 to 1 per 100,000 recipients) • Rarely, immediate anaphylactic reactions **Precautions:** • History of Guillain-Barré Syndrome (GBS) within 6 weeks of a prior dose of a tetanus-containing vaccine as tetanus vaccination has been rarely associated with recurrence of GBS. Vaccination is usually justified for children who have had fewer than 3 doses of a tetanus-toxoid-containing vaccine. • History of Arthus-type hypersensitivity reactions or a temperature or >103° F (>39° C) following a prior dose of tetanus toxoid. These persons usually have high serum tetanus antitoxin levels and should not be given doses of a tetanus-containing vaccine more frequently than every 10 years, even if they have a wound that is neither clean nor minor. • A moderate or severe acute illness is reason for deferring administration of routine primary doses or routine booster doses but not emergency doses for wound management. **Contraindications:** History of neurologic or severe hypersensitivity reaction (acute respiratory distress or collapse) following a prior dose. (If contraindications to tetanus toxoid exist, consideration should be given to administration of Tetanus Immune Globulin (TIG) when an injury is sustained that is other than a clean minor wound.)
Tetanus Toxoid for booster use only Generic Sanofi Pasteur	Not recommended for the primary series.	**Persons aged 7 years and over:** 0.5 mL IM of SC	

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Typhoid Vaccine			Vaccine efficacy of 51%-76% comparable for parenteral and oral preparations.
Typhoid Vi Polysaccharide Vaccine (ViCPs) Typhim Vi® Sanofi Pasteur	**Persons aged 2 years and over:** First: 0.5 mL IM Immunization with Typhim Vi vaccine should occur at least two weeks prior to expected exposure to S typhi.	Dose: 0.5 mL IM every 2 years when there is continued or repeated exposure	Typhoid immunization is not indicated for routine immunization of individuals in the United States (US). Typhoid immunization is recommended for: travelers to areas where a recognized risk of exposure to typhoid exists, particularly ones who will have prolonged exposure to potentially contaminated food and water; persons with intimate exposure (i.e., continued household contact) to a documented typhoid carrier; and workers in microbiology laboratories who frequently work with S typhi. **Adverse Events:**
Typhoid Vaccine live oral, Ty21a Vivotif Berna® Berna Products Corp	**Persons aged 6 years through adult:** One capsule on alternate days for a total of 4 capsules Capsules are to be taken with cool (not exceeding body temperature) liquid one hour before meals. Do not chew capsules. Completion of all 4 doses should be accomplished at least one week before potential exposure to S. typhi. Capsules must be kept refrigerated.	Dose: Entire 4-dose series every 5 years if there is continued or repeated exposure	**Parenteral vaccine**: ViCPs can cause fever, malaise, headache, injection site pain and erythema. Allergic reactions, such as pruritus, rash, urticaria, difficulty breathing, hypotension, are rare. **Live Oral vaccine:** Side effects of live oral vaccine are rare and consist of abdominal discomfort, nausea, vomiting, diarrhea, mild fever, rash or urticaria. **Contraindications:** **Parenteral :** A previous severe systemic or allergic reaction to a prior dose of ViCPs is a contraindication to future use of ViCPs. **Live Oral:** A history of hypersensitivity to a component of the vaccine or the capsule contraindicates the use of the live oral typhoid vaccine. Typhoid vaccine capsules should not be given during an acute febrile illness or during an acute GI illness (e.g., persistent diarrhea, vomiting). Do not use the live oral vaccine in immunocompromised individuals including HIV-infected individuals. Do not use live oral vaccine in persons receiving antimicrobial agents (including sulfonamides) until 24 hours or more after the antimicrobial dose. No experience reported in pregnant women for either parenteral or live oral vaccine. Consider using parenteral typhoid vaccine in pregnant women at risk of exposure to S. typhi.

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IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Varicella Vaccine Live Attenuated Varivax® Merck	**Children 12 months to 12 years:** Dose 1: 0.5 mL SC* Dose 2: 0.5 mL SC* at 4-6 years of age, or at least 3 months after the first dose** ** If the second dose is inadvertently administered at least 28 days following the first dose, the second dose does not need to be repeated. **Persons 13 years and older (including adults):** First: 0.5 mL SC* Second: 0.5 mL SC* 4-8 weeks later * To reconstitute the vaccine: Withdraw the entire contents of the diluent vial into a syringe. Inject all of the diluent in the syringe into the vial of lyophilized vaccine and gently agitate to mix thoroughly. Withdraw the entire contents into a syringe and inject the total volume of reconstituted vaccine subcutaneously (SC). Discard reconstituted vaccine if not used within 30 minutes.	Not established	**If measles, mumps, and/or rubella vaccine is also indicated, use of licensed s MMRV vaccine is preferred over separate injection of equivalent component vaccines.** **Post-exposure Immunization:** Varicella vaccine administered to susceptible persons within three days and possibly up to five days after varicella exposure may prevent or significantly modify disease. **Adverse Reactions:** Fever 102º F (15%), injection site erythema or pain or swelling (20%), varicella-like rash at injection site (3%), varicella-like rash generalized (4%-6%, average 5 lesions). Breakthrough infection (1% of vaccine recipients per year develop chickenpox, but illness is milder than what is seen in unimmunized individuals). Zoster caused by the vaccine virus has been reported, mostly among vaccinated children. **Precautions:** • Postpone vaccination of persons with moderate or severe acute illnesses until the condition has improved. • Do not administer for 3-11 months after receipt of antibody containing blood products (see table 2, page5). • Vaccination is not recommended for persons known to have untreated active tuberculosis. • Avoid the use of salicylates for 6 weeks after vaccination because of the association between aspirin use and Reye syndrome following chickenpox. **Contraindications:** • History of anaphylactic reaction to a prior dose of vaccine or to any vaccine component, including gelatin and neomycin. • Immunosuppression due to leukemia*, lymphoma, generalized malignancy, • Immune deficiency disease, or immunosuppressive therapy (note, treatment with low-dose [less than 2 mg/kg/day], alternate-day, topical, replacement, or aerosolized steroid preparations is **not** a contraindication to varicella vaccination. Persons whose immunosuppressive therapy with steroids has been discontinued for 1 month [3 months for chemotherapy] may be vaccinated.) • Varicella vaccine should not be administered to persons with cellular immunodeficiency. However, persons with isolated humoral immunodeficiency (e.g., hypogammaglobulinemia and agammaglobulinemia) should be vaccinated. • Persons with moderate or severe cellular immunodeficiency resulting from infection with HIV, including persons diagnosed with acquired immunodeficiency syndrome (AIDS) should **not** receive varicella vaccine. However, HIV-infected children aged 12 months and older in CDC clinical class N, A, or B with CD4+ T-lymphocyte counts equal to 15% or higher and without evidence of varicella immunity should receive two doses of single antigen varicella vaccine at a minimum interval of 3 months. • Pregnancy (Avoid pregnancy for at least 1 month post vaccination.) There is a registry to report inadvertent vaccination of a pregnant woman or a woman who became pregnant within 3 months of vaccination (800-896-8999). * Vaccine is available from Merck under a research protocol for special use in certain patients with acute lymphoblastic leukemia in remission.

IMMUNOBIOLOGICS

IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Yellow Fever Vaccine (Live, Attenuated) YF-VAX® Sanofi Pasteur	**Children 9 months of age or over and adults** Dose: 0.5 mL SC	Dose: 0.5 mL SC every 10 years	Yellow fever vaccines must be administered at an approved yellow fever vaccination center. Vaccine recipients should receive a completed International Certificate of Vaccination, signed and validated with the center's stamp where the vaccine was given. This certificate is valid 10 days after vaccination and for a subsequent period of 10 years. Yellow fever vaccine is indicated for persons living or traveling in endemic areas of South America and Africa, or traveling to countries that require a certificate of vaccination against yellow fever. Infants between 6 and 9 months can be considered for vaccination when risk of infection is high. Infants younger than 6 months should not be immunized because they have an increased susceptibility for vaccine-associated neurotropic disease (formerly known as postvaccinal encephalitis). Healthcare providers considering vaccinating infants less than 9 months or pregnant women should contact the Division of Vector-Borne Infectious Diseases (tel.: 970-221-6400) or the Division of Global Migration and Quarantine (tel.: 404-498-1600) at CDC for advice. Laboratory personnel with occupational risk exposure should be immunized. **Adverse Reactions:** Mild fever, headache, myalgia 5-10 days after vaccination. Rarely vaccine-associated neurotropic disease in children and vaccine associated viscerotropic disease (formerly reported as febrile multiple organ system failure) have been reported. Since 1992, five cases of encephalitis among adult recipients of yellow fever vaccine have been reported to the U.S. Vaccine Adverse Event Reporting System (VAERS). Since 1996, nine cases of yellow fever vaccine-associated viscerotropic disease, a disease clinically and pathologically resembling naturally acquired yellow fever, have been reported in the U.S.; an additional 17 cases have been identified worldwide as of October 2004. In addition, ten cases of autoimmune neurologic disease have been reported to VAERS, including patients with Guillian-Barré syndrome and acute disseminated encephalomyelitis. **Precautions:** • Defer in pregnancy, especially in first trimester, unless risk of disease higher than theoretical risk to pregnancy • Avoid vaccination of nursing mothers unless risk of disease high **Contraindications:** • Anaphylactic hypersensitivity to a prior dose or to a vaccine component, including egg and chicken protein. • Age less than 6 months • Immunocompromised status Low-dose (i.e., 20 mg prednisone or equivalent/day), short-term (i.e., <2 weeks) systemic corticosteroid therapy or intra-articular, bursal, or tendon injections with corticosteroids and intranasal corticosteroids should not be sufficiently immunosuppressive to constitute an increased hazard to recipients of yellow fever • History of thymus disease, including myasthenia gravis, thymoma, or prior thymectomy

IMMUNOBIOLOGICS

IMMUNOBIOLOGIC	PRIMARY IMMUNIZATION SCHEDULE	BOOSTER SCHEDULE	COMMENTS AND CONTRAINDICATIONS
Zoster Vaccine Live ZOSTAVAX ® Merck	**Persons aged 60 years and older:** First: 0.65-mL SC* * To reconstitute the vaccine: Withdraw the entire contents of the diluent vial into a syringe. Inject all of the diluent in the syringe into the vial of lyophilized vaccine and gently agitate to mix thoroughly. Withdraw the entire contents into a syringe and inject the total volume of reconstituted vaccine subcutaneously, preferably in the upper arm.	Not established	The October 2006 ACIP provisional recommendations for prevention of herpes zoster and post-herpetic neuralgia calls for a single dose of zoster vaccine for adults 60 years of age and older whether or not 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. **Adverse Reactions:** • Redness, soreness, swelling, or itching at the site of the injection (about 1 person in 3). • Headache (about 1 person in 70 • No serious problems have been identified with shingles vaccine **Precautions: ·** • **Postpone vaccination of persons with moderate or severe acute illnesses until the condition has improved** • **Do not administer for 3-11 months after receipt of antibody containing blood products (see table 2, page5) ·** • **Zoster vaccine is not a substitute for varicella vaccine [Varicella Virus Vaccine Live (Oka/Merck)] and should not be used in children** **Contraindications: ·** • **History of anaphylactic/anaphylactoid reaction to gelatin, neomycin, or any other component of the vaccine** • **History of primary or acquired immunodeficiency states including leukemia; lymphomas of any type, or other malignant neoplasms affecting the bone marrow or lymphatic system; or AIDS or other clinical manifestations of infection with human immunodeficiency viruses** • **On immunosuppressive therapy, including high-dose corticosteroids.** • **Active untreated tuberculosis** • **Pregnancy (There is a registry to report inadvertent vaccination of a pregnant woman or a woman who became pregnant within 3 months of vaccination (800-896-8999).)**

Questions for Discovering Precautions/Contraindications to Routine Immunizations (Infants, Children, Adolescents) (Adapted from the Immunization Action Coalition)

1. **Is the child seriously ill today?**
   There is no evidence that acute illness reduces vaccine efficacy or increases vaccine adverse events (1,2). However, as a precaution with moderate or severe acute illness, all vaccines should be delayed until the illness has improved. Mild illnesses (such as otitis media, upper respiratory infections, and diarrhea) are NOT contraindications to vaccination. Do not withhold vaccination if a person is taking antibiotics.

2. **Does the child have allergies to medications, food, or any vaccine?**
   History of anaphylactic reaction such as hives (urticaria), wheezing or difficulty breathing, or circulatory collapse or shock (not fainting) from a previous dose of vaccine or vaccine component is a contraindication for further doses. For example, if a person experiences anaphylaxis after eating eggs, do not administer influenza vaccine, or if a person has anaphylaxis after eating gelatin, do not administer MMR or varicella vaccine. Local reactions (e.g., a red eye following instillation of ophthalmic solution) are not contraindications. For additional information call the Immunization Program at (213) 351-7800.

3. **Has the child had a serious reaction to a vaccine in the past?**
   History of anaphylactic reaction (see question 2) to a previous dose of vaccine or vaccine component is a contraindication for subsequent doses (1). History of encephalopathy within 7 days following DTP/DTaP is a contraindication for further doses of pertussis-containing vaccine. Precautions to DTaP (not Tdap) include the following: (a) seizure within 3 days of a dose, (b) pale or limp episode or collapse within 48 hours of a dose, (c) continuous crying for 3 hours within 48 hours of a dose, and (d) fever of 105°F (40°C) within 48 hours of a previous dose. There are other adverse events that might have occurred following vaccination that constitute contraindications or precautions to future doses. Under normal circumstances, vaccines are deferred when a precaution is present. However, situations may arise when the benefit outweighs the risk (e.g., during a community pertussis outbreak). (e.g., community pertussis outbreak).

4. **Has the child had a seizure or a brain problem?**
   DTaP and Tdap are contraindicated in children who have a history of encephalopathy within 7 days following DTP/DTaP. An unstable progressive neurologic problem is a precaution to the use of DTaP and Tdap. For children with stable neurologic disorders (including seizures) unrelated to vaccination, or for children with a family history of seizure, vaccinate as usual but consider the use of acetaminophen or ibuprofen to minimize fever.

5. **Does the child have cancer, leukemia, AIDS, or any other immune system problem?**
   Live virus vaccines (e.g., MMR, varicella, and the intranasal live attenuated influenza vaccine [LAIV], Rotavirus) are usually contraindicated in immunocompromised children. However, there are exceptions. For example, MMR and varicella vaccines are recommended for asymptomatic HIV-infected children who do not have evidence of severe immunosuppression. For details, consult the ACIP recommendations (4, 5, 6).

6. **Has the child taken cortisone, prednisone, other steroids, or anticancer drugs, or had x-ray treatments in the past 3 months?**
   Live virus vaccines (e.g., MMR, varicella, LAIV) should be postponed until after chemotherapy or long-term high-dose steroid therapy has ended. For details and length of time to postpone, consult the ACIP statement (1). To find specific vaccination schedules for stem cell transplant (bone marrow transplant) patients, see reference 7. LAIV can only be given to healthy individuals ages 5-49 years.

7. **Has the child received a transfusion of blood or blood products, or been given a medicine called immune (gamma) globulin in the past year?**
   Certain live virus vaccines (e.g., MMR, varicella) may need to be deferred, depending on several variables. See table 2, page 3 or consult the most current ACIP recommendations or the 2003 Red Book, p. 423, for the most current information on intervals between immune globulin or blood product administration and MMR or varicella vaccination (1, 2).

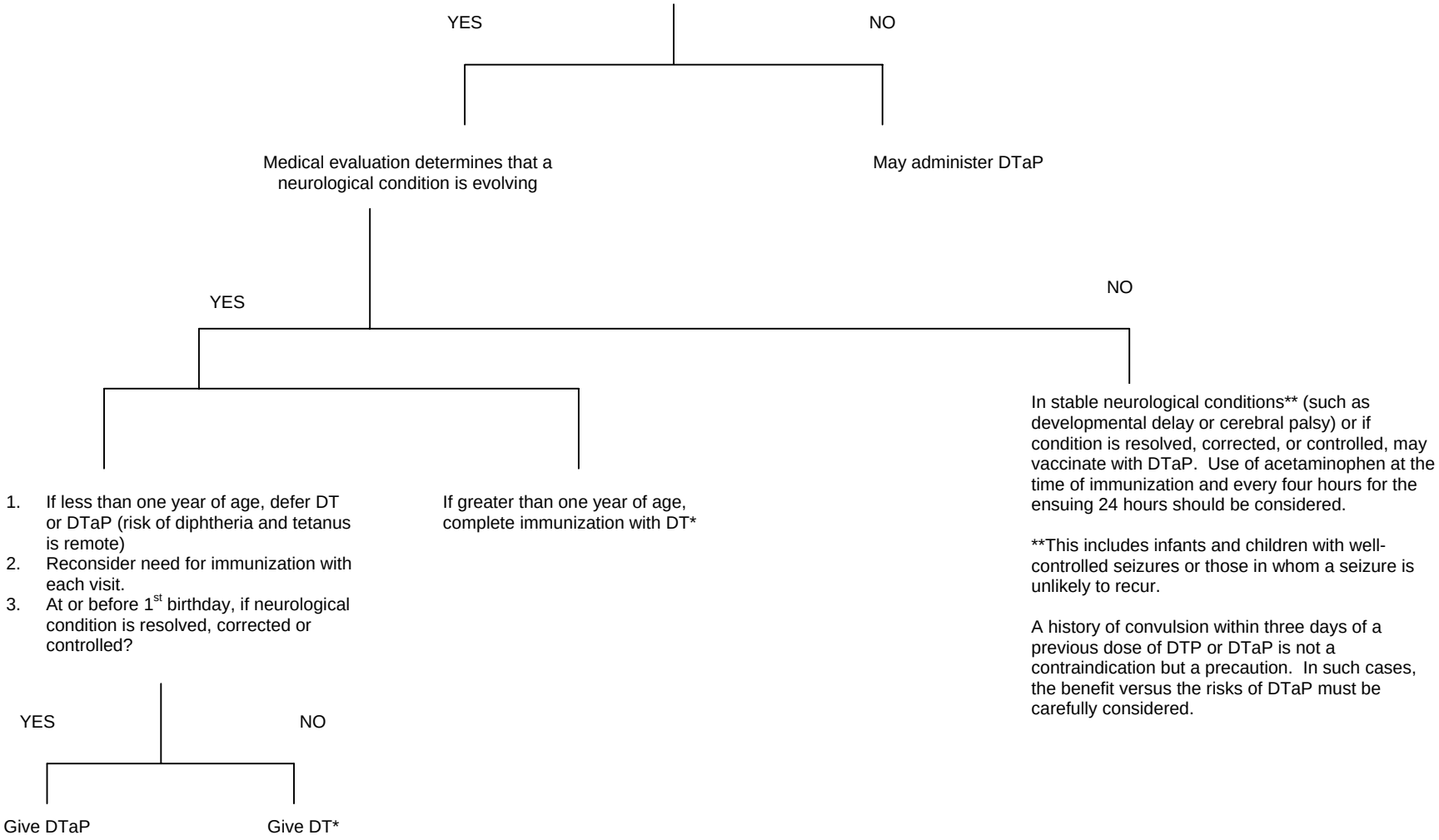
8. **Is the child/teen pregnant or is there a chance she could become pregnant during the next month?**
   Live virus vaccines (e.g., MMR, varicella, LAIV) are contraindicated prior to and during pregnancy because of the theoretical risk of virus transmission to the fetus (1, 6). Sexually active young women who receive MMR or varicella vaccination should be instructed to practice careful contraception for one month following receipt of either vaccine (8, 9). Inactivated vaccines may be given to a pregnant woman whenever indicated.

9. **Has the child received any vaccinations in the past 4 weeks?**
   If two live virus vaccines (e.g., MMR, varicella) are not given on the same day, the doses must be separated by at least 28 days. Inactivated vaccines may be given at the same time or at any spacing interval.

References

1. CDC. General recommendations on immunization. MMWR 2002;51 (RR-2).
2. AAP. 2003 Red Book: Report of the Committee on Infectious Diseases. 26th ed. Elk Grove Village, IL: AAP, 2003.
3. Table of Vaccine Components: www.cdc.gov/nip/publications/pink/appendices/a/excipient2.pdf 4.
4. CDC. Measles, mumps, and rubella vaccine use and strategies for elimination of measles, rubella, and congenital rubella syndrome and control of mumps. MMWR 1998; 47 (RR-8).
5. CDC. Prevention of varicella: updated recommendations of the ACIP. MMWR 1999;48 (RR-6).
6. CDC. Using live, attenuated influenza vaccine for prevention and control of influenza. MMWR 2003;52 (RR-13).
7. CDC. Excerpt from guidelines for preventing opportunistic infections among hematopoietic stem cell transplant recipients. MMWR 2000;49 (RR-10). www.cdc.gov/nip/publications/hsct-recs.pdf
8. CDC. Notice to readers: Revised ACIP recommendation for avoiding pregnancy after receiving a rubella-containing vaccine. MMWR 2001;50 (49).
9. CDC. Prevention of varicella. MMWR 1996;45 (RR-11).

Guidelines for DTaP Immunization of Infants and Young Children With Histories of Convulsion(s)



* For infants and children who received DT but who on further evaluation can be given pertussis vaccine, DTaP can be used, ideally as a series of 3 or more doses. However, in general, children <7 years of age should not receive more than 6 doses of diphtheria and tetanus-containing vaccines. If severe local reaction occurs, further administration of DT-containing vaccines should be reconsidered.

IMMUNIZATIONS DURING PREGNANCY

	ANTHRAX	BCG	HEPATITIS A	HEPATITIS B	HUMAN PAPILLOMAVIRUS	INFLUENZA INACTIVATED
RISK FROM DISEASE TO PREGNANT FEMALE	Significant morbidity and mortality; not altered by pregnancy	Possible increased risk to the health of the mother if she becomes severely ill with tuberculosis	Undetermined	Possible increased severity during third trimester	HPV may grow faster during pregnancy, If the warts are in the vagina, they rarely can make the vagina less elastic and cause obstruction during delivery.	Increase in morbidity during second and third trimester
RISK FROM DISEASE TO FETUS OR NEONATE	No known harm to fetus	Probably increased risk of abortion. Possible lower birth weight and, rarely, the infant may be born with TB.	None suspected	Possible increase in abortion rate and prematurity; neonatal hepatitis can occur; high risk of carrier state for newborn	Uncommonly transmitted to fetus during birth; very rarely recurrent respiratory papillomatosis, results	Possible increased abortion rate. No malformations confirmed
VACCINE	Cell-free inactivated vaccine	Live, attenuated vaccine	Inactivated viral antigen	Recombinant vaccine	Recombinant Vaccine (HPV Types 6, 11, 16, 18)	Inactivated type A and type B virus vaccine
RISK FROM VACCINE TO FETUS	None confirmed	None suspected	None confirmed	None suspected	None confirmed	None suspected
INDICATIONS FOR VACCINATION DURING PREGNANCY	Use only if potential benefits of vaccination outweigh potential risks to fetus	Contraindicated	Weigh risk of vaccination against risk of women being exposed to HAV.	Pre- and post-exposure for women at risk of infection	Not recommended for use in pregnant women.	Recommended for women who will be pregnant during influenza season
DOSE/SCHEDULE	Subcutaneous injections at 0, 2, and 4 wks, then 6 mos, 12 mos, and 18 mos. Annual booster injection if immunity is to be maintained.	Not applicable	2 doses IM 6-12 months apart	3 doses IM: First dose and second dose 1 month apart; third dose 6 months after first and at least 2 months after second	Not applicable	1 dose IM annually
COMMENTS	Vaccine licensed for preexposure use only.	Vaccine not routinely used in the United States.	Safety in pregnancy undetermined, risk expected to be low	HBsAg testing of all pregnant women is required by California law	Report exposure to vaccine during pregnancy by calling Merck at (800) 986-8999.	Some experts prefer vaccination in the second trimester to avoid coincidental association of the vaccine with early pregnancy loss

Prophylaxis During Pregnancy: Immune or hyperimmune globulin can be administered to pregnant women who have been exposed to hepatitis A, B, chickenpox, or measles. There are no known contraindications to their use during pregnancy.

IMMUNIZATIONS DURING PREGNANCY

	INFLUENZA LIVE	JAPANESE ENCEPHALITIS	MEASLES	MENINGOCOCCAL POLYSACCHARIDE	MENINGOCOCCAL CONJUGATE	MUMPS
RISK FROM DISEASE TO PREGNANT FEMALE	Increase in morbidity during second and third trimester		Significant morbidity; low mortality	Significant morbidity and mortality; not altered by pregnancy	Significant morbidity and mortality; not altered pregnancy	Low morbidity and mortality; not altered by pregnancy
RISK FROM DISEASE TO FETUS OR NEONATE	Possible increased abortion rate. No malformations confirmed	Can cause intrauterine infection and abortion if acquired during the first or second trimesters	Increase in abortion rate	Unknown to fetus. Infants can develop disease with significant morbidity and mortality.	Unknown to fetus; Infants can develop disease with significant morbidity and mortality.	Probable increased rate of abortion in the first trimester
VACCINE	Live, attenuated type A and type B virus vaccine	Inactivated viral antigen	Live, attenuated virus vaccine	Purified capsular polysaccharide vaccine (quadrivalent A/C/Y/W-135)	Conjugate vaccine (quadrivalent A/C/Y/W-135)	Live, attenuated virus vaccine
RISK FROM VACCINE TO FETUS	None suspected	None confirmed	None confirmed	None confirmed	None confirmed	None confirmed
INDICATIONS FOR VACCINATION DURING PREGNANCY	Contraindicated	Weigh risk of vaccination against risk of women being exposed to JE.	Contraindicated	Can use if pregnant women is in one of the high-risk groups for infection	Not contraindicated; no date on safety during pregnancy	Contraindicated
DOSE/SCHEDULE	Not applicable	3 doses SC at 0, 7, and 30 days	Not applicable	1 dose for adolescents and adults in high-risk groups with consideration for revaccination 3-5 years later, if person remains at high risk.	Not applicable	Not applicable
COMMENTS		Vaccine not routinely used in the United States.	Immune globulin to exposed susceptible pregnant females. Vaccination of susceptible women should be part of postpartum care.	Not recommended routinely for non-high-risk individuals	High-risk pregnant women should be vaccinated with the older polysaccharide meningococcal vaccine at this time	Vaccination of susceptible women should be part of postpartum care.

Prophylaxis During Pregnancy: Immune or hyperimmune globulin can be administered to pregnant women who have been exposed to hepatitis A, B, chickenpox, or measles. There are no known contraindications to their use during pregnancy.

IMMUNIZATIONS DURING PREGNANCY

	PNEUMOCOCCAL	POLIOMYELITIS	RABIES	RUBELLA	Tetanus/Diphtheria	PERTUSSIS (Tdap)
RISK FROM DISEASE TO PREGNANT FEMALE	Significant morbidity; not altered by pregnancy	Possible increased risk of more severe disease.	Severe morbidity and mortality (virtually uniformly fatal); not altered by pregnancy	Low morbidity and mortality, not altered by pregnancy	Severe morbidity. Tetanus mortality 60%; diphtheria mortality 10%; unaltered by pregnancy	Significant pertussis morbidity; low mortality; not altered by pregnancy. See Tetanus/Diphtheria
RISK FROM DISEASE TO FETUS OR NEONATE	Undetermined	Anoxic fetal damage reported; 50% mortality in neonatal disease	No mother-to-fetus transmission has been described; disease nearly uniformally fatal	High rate of abortion and congenital rubella syndrome	Neonatal tetanus mortality 60%	Neonates at higher risk for severe pertussis disease and complications
VACCINE	23 purified capsular polysaccharide antigens	Enhanced potency inactivated virus vaccine (Live, attenuated virus vaccine no longer available in the United States)	Inactivated viral antigen	Live, attenuated virus vaccine	Tetanus and diphtheria toxoids	Tetanus/ diphtheria toxoids and acellular pertussis
RISK FROM VACCINE TO FETUS	None confirmed	None confirmed	None suspected	None confirmed	None confirmed	None confirmed
INDICATIONS FOR VACCINATION DURING PREGNANCY	Not recommended unless substantial risk exists	Not recommended routinely; if a pregnant woman requires immediate protection, administer IPV in accordance with the recommended schedule for adults.	Postexposure prophylaxis and if the risk of exposure to rabies is substantial, preexposure prophylaxis might also be indicated.	Contraindicated	Lack of primary series, or no booster within past 10 years	Not contraindicated, but not currently recommended during pregnancy
DOSE/SCHEDULE	Single dose IM or SC.	2 doses of IPV, SC 4-8 weeks apart with the third dose 6-12 months later.	5 doses IM on day 0 (initial), 3, 7,14, 28	Not applicable	Primary: 2 doses IM 4-8 weeks apart with the third dose 6-12 months later. Booster: Single dose every 10 years	Single dose IM to replace one dose of Td
COMMENTS	Safety of vaccine during first trimester has not been evaluated, although no adverse consequences have been reported among newborns whose mothers were inadvertently vaccinated during pregnancy.	Vaccine indicated for susceptible pregnant women traveling in areas where risk of exposure to wild virus is substantial.		Prenatal rubella testing required by California law. Vaccination of susceptible women should be part of postpartum care	On theoretical grounds, waiting until the second trimester is reasonable; there is no evidence that either toxoid is teratogenic.	Any woman who might become pregnant is encouraged to receive a single dose of Tdap. Offer vaccination in the immediate postpartum period.

Prophylaxis During Pregnancy: Immune or hyperimmune globulin can be administered to pregnant women who have been exposed to hepatitis A, B, chickenpox, or measles. There are no known contraindications to their use during pregnancy.

IMMUNIZATIONS DURING PREGNANCY

	TYPHOID	VACCINIA (SMALLPOX)	VARICELLA	YELLOW FEVER	ZOSTER	
RISK FROM DISEASE TO PREGNANT FEMALE	Significant morbidity and mortality; not altered by pregnancy	Severe morbidity and mortality; more severe infection among pregnant women	Increased morbidity; third trimester may cause severe infection, including pneumonia	Significant morbidity and mortality; not altered by pregnancy	Increased morbidity; third trimester may cause severe infection, including pneumonia	
RISK FROM DISEASE TO FETUS OR NEONATE	Unknown	Occasionally results in abortion or stillbirth with evidence of lesions on the skin	Rarely congenital varicella syndrome. Maternal infection 5 days before to 2 days after delivery may result in severe, often fatal infection of newborn	Unknown	Rarely congenital varicella syndrome. Maternal infection 5 days before to 2 days after delivery may result in severe, often fatal infection of newborn	
VACCINE	Killed or live attenuated oral bacterial vaccine	Live-virus preparation	Live, attenuated virus vaccine	Live, attenuated virus vaccine	Live, attenuated virus vaccine	
RISK FROM VACCINE TO FETUS	Not confirmed	Very rarely, fetal vaccinia infection, which usually results in stillbirth or death of the infant soon after delivery.	None confirmed	Unknown	None confirmed	
INDICATIONS FOR VACCINATION DURING PREGNANCY	Not recommended routinely except for close, continued exposure to travel to highly endemic areas	Contraindicated unless exposed smallpox virus	Contraindicated	Contraindicated except in areas in which transmission in humans is occurring.	Contraindicated	
DOSE/SCHEDULE	Inactivated: Primary: Single dose Booster: Single dose every 2 years. Oral :Primary: 4 doses on alternate days. Booster: 4-dose series every 5 years	Contact Public Health's Immunization Program	Not applicable	Single dose SC Booster: Single dose SC every 10 years	Not applicable	
COMMENTS	No data have been reported on the use of typhoid vaccines among pregnant women. ACOG expressed preference for oral vaccine		Manufacturer registry to report inadvertent vaccination of pregnant women or women who became pregnant within 3months of vaccination: (800) 986-8999. Consider vaccination of susceptible women postpartum.	For quarantine officers abroad, letter of contraindication should be given. Postponement of travel preferable to vaccination if possible/		

Prophylaxis During Pregnancy: Immune or hyperimmune globulin can be administered to pregnant women who have been exposed to hepatitis A, B, chickenpox, or measles. There are no known contraindications to their use during pregnancy.

STORAGE AND HANDLING OF COMMON IMMUNOBIOLOGICS

Proper handling of biologics to maintain their potency is essential. The following guidelines must be followed when handling and storing these products.

DT: **Diphtheria-Tetanus Toxoids - Pediatric**
Td: **Tetanus-Diphtheria Toxoids - Adult**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Instructions for Use: Shake well before withdrawal and use. Do not use if resuspension does not occur with vigorous shaking

Shelf Life After Opening: The vaccine should be administered shortly after withdrawal from the vial. Unused portions of multidose vials may be refrigerated at 35° to 46°F (2° to 8°C) and used until outdated, if not contaminated.

DTaP: **Diphtheria-Tetanus Toxoids, Acellular Pertussis Vaccine – Pediatric**
DTaP/Hib: **Diphtheria-Tetanus Toxoids, Acellular Pertussis Vaccine combined with Haemophilus influenzae type b conjugate vaccine* - Pediatric**
DTaP/HepB/IPV:
Tdap: **Diphtheria-Tetanus Toxoids, Acellular Pertussis Vaccine, Hepatitis B Vaccine, Inactivated Polio Vaccine – Pediatric**
Tetanus-Diphtheria Toxoid, Acellular Pertussis Vaccine – Adult

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Instructions for Reconstitution* or Use: Shake well before withdrawal and use. Do not use if resuspension does not occur with vigorous shaking.

Shelf Life After Reconstitution*: The vaccine should be administered shortly after withdrawal from the vial or for manufacturer-filled syringes shortly after the needle is attached.

* ActHIB® (sanofi pasteur) should be used within 24 hours of reconstitution if used alone. If sanofi pasteur DTaP is used to reconstitute ActHIB®, the TriHibit® vaccine must be used within 30 minutes of reconstitution. Only sanofi pasteur DTaP-Tripedia® or the diluent shipped with the product may be used to reconstitute the sanofi pasteur ActHIB® product. Sanofi pasteur DAPTACEL® is not licensed for use in reconstitution of ActHIB®.

HAV: **Hepatitis A Vaccine**
HBV: **Hepatitis B Vaccine**
HAV/HBV: **Hepatitis A and Hepatitis B Vaccine**
HBV/Hib: **Hepatitis B and *Haemophilus influenzae* type b Vaccine**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Instructions for Use: Shake vigorously before withdrawal and use. Do not use if resuspension does not occur with vigorous shaking.

Shelf Life After Opening: The vaccine should be administered shortly after withdrawal from the vial or for manufacturer-filled syringes shortly after the needle is attached.

Hib: **Haemophilus influenzae type b Conjugate Vaccine**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Instructions for Reconstitution or Use: Shake vigorously before withdrawal and use. Do not use if resuspension does not occur with vigorous shaking.

Shelf Life After Opening: The vaccine should be administered shortly after withdrawal from the vial or for manufacturer-filled syringes shortly after the needle is attached.

* ActHIB® (sanofi pasteur) should be used within 24 hours of reconstitution if used alone. If sanofi pasteur DTaP is used to reconstitute ActHIB®, the TriHibit® vaccine must be used within 30

minutes of reconstitution. Only sanofi pasteur DTaP-Tripedia® or the diluent shipped with the product may be used to reconstitute the sanofi pasteur ActHIB® product. Sanofi pasteur DAPTACEL® is not licensed for use in reconstitution of ActHIB®.

HPV **Human Papillomavirus Vaccine**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures. Protect from light.

Instructions for Reconstitution or Use: Thorough agitation immediately before administration is necessary to maintain suspension of the vaccine. Do not use the product if particulates are present or if it appears discolored.

Shelf Life After Opening: The vaccine should be administered shortly after withdrawal from the vial or for manufacturer-filled syringes shortly after the needle is attached.

IPV: I**nactivated Polio Vaccine**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Instructions for Use: Multidose Vials: Shake vial vigorously before withdrawal and use. Withdraw 0.5 mL of vaccine into separate sterile needle and syringe for each immunization.

Shelf Life After Opening: The vaccine should be administered shortly after withdrawal from the vial. Doses remaining in the vial may be used until outdated if not contaminated.

TIV: **Trivalent Inactivated Influenza Vaccine**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

LAIV: **Live Attenuated Influenza Vaccine**

Shipping Requirements: Should be shipped frozen in insulated container with dry ice at 4°F (-20°C) or colder. Shipment includes WarmMark™ temperature indicator.

Condition upon Arrival: Should be frozen at 4°F (-20° C) or colder; must not have thawed in shipment. (All windows in WarmMark™ indicator should be white. If any indicator windows are red, do not use the product. Call the manufacturer for further instructions.)

Storage Requirements: Upon arrival, immediately store the vaccine in a freezer with its own exterior door. Must be maintained in a continuously frozen state at 5°F (-15°C) or colder. No freeze/thaw cycles are permitted with this vaccine. May be stored in either a manual defrost freezer or in a frost-free freezer compartment. In order to maintain the temperature of 5°F (-15°C) or colder in the freezer, it will be necessary in most refrigerator/freezer models to turn the temperature dial down to the coldest setting. This may result in the refrigerator compartment temperature being lowered as well. Careful monitoring of the refrigerator temperatures will be necessary to avoid freezing killed or inactivated vaccines.

NOTE: The manufacturer supplied freezer box is no longer required for storage of LAIV vaccine in a frost-free freezer.

Shelf Life: Formulated for use during current influenza season.

Instructions for Use: Thaw sprayer in palm of hand before administering. Do not roll the vaccine sprayer in your hand, as this may dislodge the dose divider clip. May also be thawed in a refrigerator and stored at 35° to 46°F (2° to 8°C) for no more than 60 hours prior to use. Do not refreeze after thawing.

Shelf Life After Thawing: The vaccine should be administered shortly after thawing. Vaccine thawed in the refrigerator and stored at 35° to 46°F (2° to 8°C) that is not used within 60 hours must be discarded in an impenetrable sharps container.

Special Instructions: Discard sprayers in approved biological waste containers.

MMR: **Measles-Mumps-Rubella Vaccine**
MR: **Measles-Rubella Vaccine (No longer distributed in the U.S.)**
Measles: **Measles Virus Vaccine**
Mumps: **Mumps Virus Vaccine**
Rubella: **Rubella Virus Vaccine**

Shipping Requirements: Vaccine: Use insulated container. Must be shipped with refrigerant. Maintain at 50°F (10°C) or less. If shipped with dry ice, diluent must be shipped separately. Diluent: May be shipped with vaccine, but do not place in container with dry ice.

Condition upon Arrival: Maintain at 50°F (10° C) or less. If above this temperature, see instructions (*) below. Do not use warm vaccine. Freeze or refrigerate upon arrival.

Storage Requirements: Vaccine may be stored separately from diluent. Store as follows: Vaccine: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). **NOTE:** It is preferred that freeze-dried (lyophilized) MMR vaccine be maintained at freezer temperatures. Protect from light at all times, since such exposure may inactivate the virus. Diluent: May be refrigerated or stored at room temperature (68° to 77°F [20° to 25°C]). Do not freeze or expose to freezing temperatures.

Instructions for Reconstitution and Use: Reconstitute just before using. Use only the diluent supplied to reconstitute the vaccine. Inject diluent into the vial of lyophilized vaccine and agitate to ensure thorough mixing. Withdraw entire contents into syringe and inject total volume of vaccine subcutaneously.

Shelf Life After Reconstitution, Thawing or Opening: After reconstitution, use immediately or store in a dark place at 35° to 46°F (2° to 8°C). Discard if not used within 8 hours.

Special Instructions: Discard vaccine vials in approved biological waste containers.

MCV4: **Meningococcal Conjugate Vaccine, Groups A, C, Y, W-135**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures. Protect from light.

Instructions for Reconstitution and Use: Follow manufacturer's

MPSV4: **Meningococcal Polysaccharide Vaccine, Groups A, C, Y, W-135**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35º to 46º F (2º to 8º C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Instructions for Reconstitution and Use: Reconstitute gently. This is a white powder that yields a clear, colorless liquid when reconstituted with 0.6 ml (single-dose vial) or 6 ml (10-dose vial) of sterile distilled water.

Shelf Life After Reconstitution, Thawing or Opening: Single-Dose Vials: Use within 30 minutes of reconstitution. Multidose Vials: Unused portions of multidose vials may be refrigerated at 35° to 46°F (2° to 8°C) and used up to 35 days after reconstitution.

PCV: **Pneumococcal Conjugate Vaccine (7-Valent)**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Instructions for Use: Vaccine should appear as a homogenous white suspension after vigorous shaking. The vaccine should be administered intramuscularly only.

Shelf Life After Opening: The vaccine should be administered shortly after withdrawal from the vial.

Special Instructions: This vaccine is a suspension containing adjuvant and should not be used if the particles cannot be resuspended after vigorous shaking.

PPV: **Pneumococcal Polysaccharide Vaccine (Polyvalent)**

Shipping Requirements: Should be shipped in insulated container. Maintain temperature at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Refrigerate immediately upon arrival. Store at 35° to 46°F (2° to 8°C). Do not freeze or expose to freezing temperatures.

Shelf Life: Check expiration date on vial or container.

Instructions for Use: Follow manufacturer's directions.

Shelf Life After Reconstitution, Thawing or Opening: Single-Dose Vials: The vaccine should be administered shortly after withdrawal from the vial. Multidose Vials: Unused portions of multidose vials may be refrigerated at 35° to 46°F (2° to 8°C) and used until outdated, if not contaminated.

Rotavirus: **Rotavirus Vaccine**

Shipping Requirements: Transport refrigerated at 2-8°C (36-46°F). Protect from light.

Condition upon Arrival: Should not have been frozen or exposed to freezing temperatures. Refrigerate upon arrival.

Storage Requirements: Store refrigerated at 2-8°C (36-46°F). Protect from light at all times, since such exposure may inactivate the virus. Do not freeze or expose to freezing temperatures. For information regarding stability under conditions other than those recommended, call 1-800-MERCK-90.

Instruction for Use: Vaccine should be administered as soon as possible after being removed from refrigeration.

Special Instructions: Discard vaccine tubes in approved biological waste containers.

Varicella: **Varicella (Chickenpox) Vaccine**
MMRV: **Measles-Mumps-Rubella and Varicella Vaccine**
Zoster: **Zoster Vaccine**

Shipping Requirements: Vaccine: Use insulated container. Must be shipped with dry ice only, at 4°F (-20°C) or colder. Should be delivered within 2 days. Diluent: May be shipped with vaccine, but do not place in container with dry ice.

Condition upon Arrival: Should be frozen. Vaccine should remain at 4°F (-20°C) or colder until arrival at the healthcare facility. Dry ice should still be present in the shipping container when vaccine is delivered.

HUMAN IMMUNE GLOBULIN (GAMMA GLOBULIN)

For passive immunization against diseases. Administered intramuscularly (IM).

A. **Immune globulin (IG)**, prepared from plasma of unselected donors for passive immunization against infectious agents to which antibody levels in general donor populations are relatively high.

1. **Established efficacy:** Benefit established.

a) **Viral Hepatitis, type A:** Travelers: All susceptible persons traveling to or working in countries that have high or intermediate hepatitis A endemicity should be vaccinated or receive IG before departure. Hepatitis A vaccination at the age appropriate dose is preferred. In the case of travel within 4 weeks of Hepatitis A vaccine administration, a dose of immune globulin (0.02 mL/kg) may be given alone or in addition to hepatitis A vaccine, at a different site, for optimal protection. Travelers who are <1 years of age, are allergic to a vaccine component, or otherwise elect not to receive vaccine should receive a single dose of IG (0.02 mL/kg; maximum 2.0 mL), which provides effective protection against HAV infection for up to 3 months. Those who do not receive vaccination and plan to travel for >3 months should receive an IG dose of 0.06 mL/kg (maximum 5 mL), which must be repeated if the duration of travel is >5 months. (For those who may require repeated IG prophylaxis, screening for anti-HAV may be useful to determine susceptibility and eliminate unnecessary IG doses for those already immune.)

Post-exposure prophylaxis: Post-exposure prophylaxis should be administered as soon as possible at a dose of 0.02 mL/kg; use of IG more than 2 weeks after exposure is not indicated. IG is recommended for all household and sexual contacts of cases. IG should be administered to all previously unvaccinated staff and attendees of child care centers or homes if (a) one or more cases of hepatitis A are recognized in children or employees or (b) cases are recognized in two or more households of center attendees. In centers that do not provide care to children who wear diapers, IG need be administered only to classroom contacts of an index patient. When an outbreak occurs (i.e., hepatitis A cases in three or more families), IG also should be considered for members of households that have children (center attendees) in diapers. Hepatitis A vaccine may be administered at the same time as IG for children receiving postexposure prophylaxis in child care centers.

If a food handler receives a diagnosis of hepatitis A, IG should be administered to other food handlers at the same establishment. Because common-source transmission to patrons is unlikely, IG administration to patrons typically is not indicated but may be considered if 1) during the time when the food handler was likely to be infectious, the food handler both directly handled uncooked foods or foods after cooking and had diarrhea or poor hygienic practices, and 2) patrons can be identified and treated <2 weeks after the exposure. In settings in which repeated exposures to HAV might have occurred (e.g., institutional cafet**erias),** stronger consideration of IG use might be warranted. In the event of a common-source outbreak, IG should not be administered to exposed persons after cases have begun to occur because the 2-week period during which IG is effective will have been exceeded.

b) **Measles:** If administered within 6 days of exposure, IG can prevent or modify measles in a non-immune person. However, any immunity conferred is temporary unless modified or typical measles occurs. The usual recommended dose of IG is 0.25 mL/kg (0.11 mL/lb) of body weight (maximum dose = 15 mL). For immunocompromised persons the dose is 0.5 mL/kg of body weight (maximum dose = 15 mL)). For persons receiving IGIV therapy, administration of at least 100 mg/kg within 3 weeks before measles exposure should be sufficient to prevent measles infection.

IG is indicated for susceptible household contacts of measles patients, particularly those for whom the risk for complications is increased (i.e., infants aged <12 months, pregnant women, or immunocompromised persons). Infants <6 months of age are usually immune because of passively acquired maternal antibodies. However, if measles is diagnosed in a mother, unvaccinated children of all ages in the household who lack other evidence of measles immunity should receive IG. IG prophylaxis is not indicated for household contacts who have received a dose of measles vaccine on or after the first birthday, unless they are immunocompromised. Only if administered within 72 hours of initial measles exposure is MMR vaccine acceptable for postexposure prophylaxis in household contacts aged >6 months except pregnant women, immunocompromised patients, and others for whom vaccine is contraindicated. IG should not be used to control measles outbreaks. Any person exposed to measles who lacks evidence of measles immunity and to whom IG is administered should subsequently receive MMR vaccine, which should be administered no earlier than 5-6 months after IG administration, provided the person is then aged ≥12 months and the vaccine is not otherwise contraindicated.

2. **Efficacy equivocal:** Benefit, if any, not established

a) Prevention of rubella in the first trimester of pregnancy
b) Prevention of viral hepatitis type b. Use HBIG.
b) Hepatitis C
c) Hepatitis E

B. Specific immune globulins, prepared from plasma of donors selected because of high levels of antibody to the specific diseases.

1. **Tetanus immune globulin (TIG):** 250 U for wound prophylaxis; 3,000-6,000 U for therapy (see “Wound Management”).

2. Rabies immune globulin (RIG): See “Rabies Prevention Flowchart.”

3. Hepatitis B immune globulin (HBIG): HBIG is recommended for post-exposure prophylaxis to HBV by percutaneous, mucosal, sexual, household or Perinatal exposure. HBIG should be given as soon as possible, preferably within 12 hours for Perinatal exposure, within 24 hours for percutaneous or mucosal exposure, and within 14 days of sexual contact. The dose is 0.5 mL for newborns and 0.06 mL/kg (max. 5 mL) for others.

4. **Varicella-zoster immune globulin (VariZIG):** Currently there is no licensed Varicella zoster immune globulin in the United States. There is an investigational varicella zoster immune globulin (VariZIG) available for use under IND protocols, which may prevent or modify V-Z infection if administered within 96 hours after exposure.

Patients without evidence of immunity to varicella (i.e., without history of disease or age-appropriate vaccination) who are at high risk for severe disease and complications, who have been exposed to varicella, and from whom informed consent has been obtained, are eligible to receive the IND application product under an expanded access protocol. The patient groups recommended by ACIP to receive VariZIG include the following:

a) Immunocompromised patients.
b) Neonates whose mothers have signs and symptoms of varicella around the time of delivery (i.e., 5 days before to 2 days after).
c) Premature infants born at >28 weeks of gestation who are exposed during the neonatal period and whose mothers do not have evidence of immunity.
d) Premature infants born at <28 weeks of gestation or who weigh <1,000 g at birth and were exposed during the neonatal period, regardless of maternal history of varicella disease or vaccination.
e) Pregnant women.

Investigational VariZIG is supplied in 125-U vials. The recommended dose is 125 units/10 kg body weight, up to a maximum of 625 units (five vials). The minimum dose is 125 U. This product can be requested from the sole authorized U.S. distributor, FFF Enterprises (Temecula, California) (24-hour telephone, 800-843-7477). For more information on ordering VariZIG see MMWR/March 3, 2006/55(08); 209-210, or MMWR Early Release/ February 24, 2006 (http://cdc.gov/mmwr). Any patient who receives investigational VariZIG should be observed closely for signs or symptoms of varicella for 28 days after exposure because VariZIG might prolong the incubation period by >1 week. Antiviral therapy should be instituted immediately if signs or symptoms of varicella disease occur.

Immune globulin intravenous (IGIV): When indicated, health-care providers should make every effort to obtain and administer VariZIG. 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 should also 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 anti-varicella antibodies. The recommended IGIV dose for postexposure prophylaxis of varicella is 400 mg/kg, administered once. For pregnant women who cannot receive VariZIG within 96 hours of exposure, clinicians may choose either to administer IGIV or closely monitor the women for signs and symptoms of varicella and institute treatment with acyclovir if illness occurs.

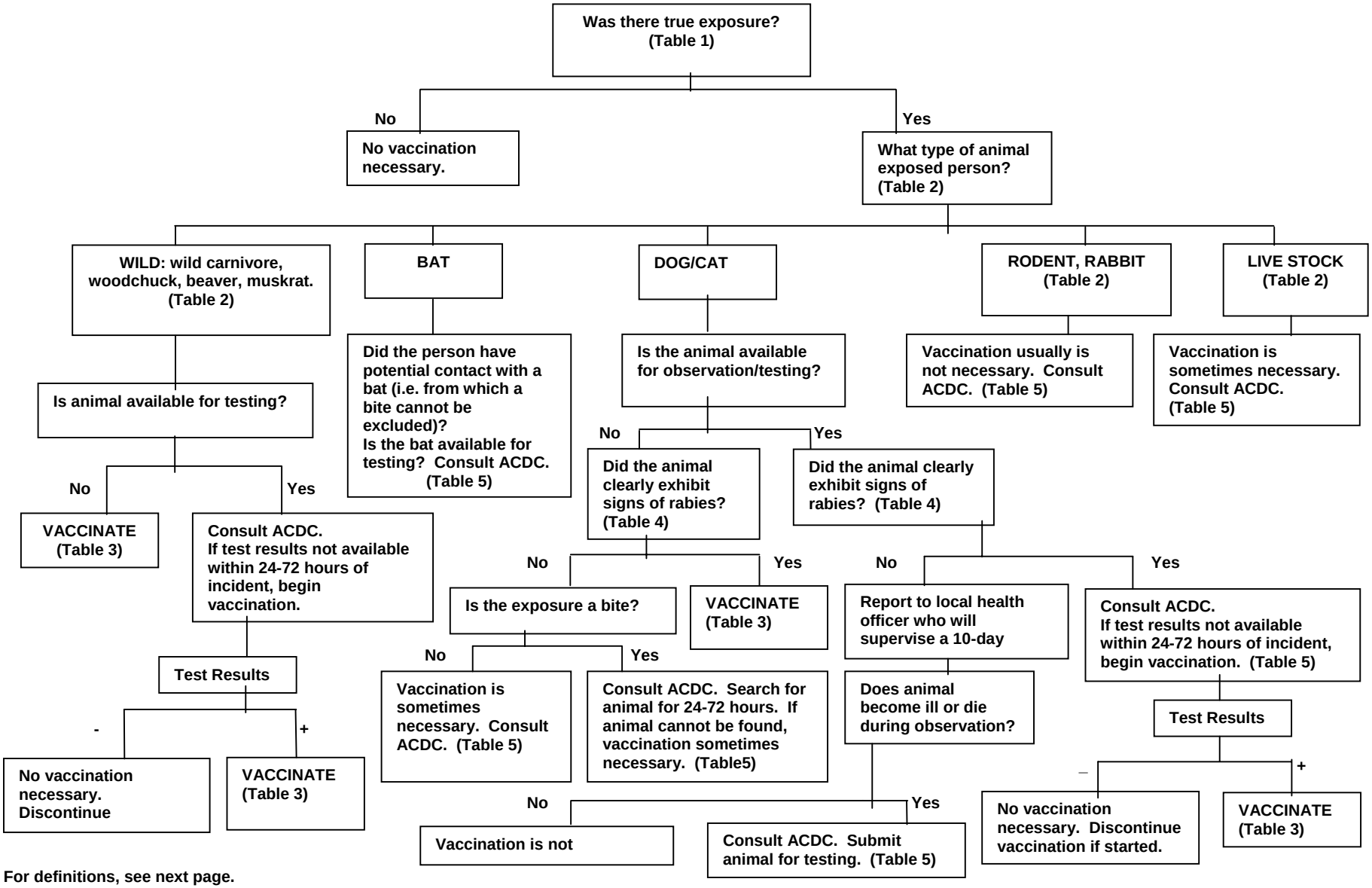
Note: Any type of immune globulin may cause biological false-positive serologic test (STS) for syphilis and *Treponema pallidum* inactivation (TPI) tests for syphilis. If a diagnosis of syphilis is being considered, a blood sample should be obtained prior to IG administration.

NON-HUMAN ANTITOXINS

A. Diphtheria antitoxin (equine origin) 20,000 to 120,000 U for therapy. Screen for horse serum allergy before use. Call ACDC at (213) 240-7942 (974-1234 after hours) to arrange for treatment of the patient.
B. Botulinum antitoxin (equine origin): Trivalent (A, B, E) antitoxin preferable for therapy. Antitoxin therapy is more effective if undertaken early in the course of illness. Before administration of antitoxin, skin testing should be performed to test for sensitivity to serum or antitoxin (see package insert). Administration of one 10-ml vial of trivalent botulism antitoxin by the intravenous route results in serum levels of type A, B, and E antibodies capable of neutralizing serum toxin concentrations many fold in excess of those reported for botulism patients. Therefore, after skin testing for sensitivity, contrary to the antitoxin package insert, administration of one vial of antitoxin intravenously is recommended and antitoxin need not be repeated since the circulating antitoxins have a half-life of 5 to 8 days. Call ACDC at (213) 24-7941 (974-1234 **after hours) to arrange for treatment of the patient.**

Note: Human derived botulinum antitoxin (BIG) is available from the California Department of Health Services and should be considered for use in infants in preference to equine derived antitoxin. Call the State at (510) 231-7600.

RABIES PREVENTION FLOWCHART
HUMAN EXPOSURE



For definitions, see next page.

RABIES PREVENTION

Table 1. Definition of exposure

Exposure: Rabies can be transmitted only when the saliva or neural tissue of an infected animal is introduced into open cuts or wounds, membranes (e.g., mouth, nose, eyes).

Bite: Any penetration of the skin by an animal's teeth. Bites are high-risk exposures. Bites to the face and hands carry the highest risk.

Non-bite exposure: Scratches, abrasions, open wounds or mucous membranes contaminated with saliva or neural tissue from a rabid animal constitute non-bite exposures. If the material containing the virus is dry, the virus can be considered noninfectious.

Non-exposures: Other contact by itself, such as being in the vicinity of, petting, or handling an animal, or coming into contact with the blood, normally does not constitute exposure, and therefore does not require postexposure vaccination. However, because the injury inflicted by a bat bite or scratch may be small and not evident, prophylaxis is indicated for situations in which a bat is physically present if a bite or mucous membrane exposure cannot be excluded and prompt testing of the bat to exclude rabies cannot be arranged.

Table 2. Type of Animal

Wild:
- Bat
- Wild carnivore (including raccoon, fox, skunk, opossum, coyote, bobcat, ferret, weasel, fisher, mink, ermine, wolf, wolf-hybrid, other)
- Beaver
- Muskrat
- Woodchuck (groundhog)

Cat or Dog:
- Wolf-hybrid dog handled as a wild animal

Rodent, Rabbit:
- Rodent (including chipmunk, porcupine, gerbil, guinea pig, hamster, mouse, rat, squirrel, vole, mole)
- Rabbit or hare

Livestock:
- Including cow, donkey/mule, goat, horse, pony, pig/hog/swine, sheep

Table 3. Rabies Postexposure Schedule*

Vaccination	Treatment	Regimen**
All exposures	Local wound treatment	All postexposure treatment should begin with immediate and thorough washing of all bite wounds and scratches with soap and water. Tetanus prophylaxis and measures to control bacterial infection should be given as indicated.
Not previously vaccinated	HRIG (Human Rabies Immune Globulin)	20 IU/kg body weight. If anatomically feasible, up one-half the dose should be infiltrated around the wound(s) and the rest should be administered IM into the gluteal area. HRIG should not be administered in the same syringe or into the same anatomical site as vaccine. Because HRIG may partially suppress active production of antibody, no more than the recommended dose should be given (0.06 x lbs. = mL HRIG).
	Vaccine	HDCV, RVA, or PCEC, 1.0 mL IM (deltoid area*), one each days 0, 3, 7, 14, and 28.
Previously Vaccinated†	HRIG	**HRIG should not be administered.**
	Vaccine	HDCV, RVA, or PCEC, 1.0 mL IM (deltoid area*), one each on days 0 and 3.

* Both HRIG and HDCV can be obtained within 24 hours from sanofi pasteur; call (800) Vaccine (822-2463). RVA: Bio-Port Corp at (517) 327-1500. PCEC: Novartis Vaccine at (800) 244-7668. HRIG can be purchased from Bayer Corporation Pharmaceutical Division at (800) 288-8370.

** These regimens are applicable for all age groups, including children. Pregnancy is not a contraindication for rabies prophylaxis. When rabies postexposure prophylaxis is administered to persons who are immunosuppressed by disease or medications, it is especially important that a serum sample be tested for rabies antibody to ensure that an acceptable response has developed. Local pain, low grade fever, headache and malaise can follow receipt of HRIG. **Once initiated, rabies prophylaxis should not be interrupted or discontinued because of mild adverse reactions.** Serious systemic reactions are rare (6% among persons receiving booster doses of HDCV, and much less frequent among those receiving primary vaccination). In the face of a serious systemic reaction, advice and assistance in management should be sought before deciding to discontinue vaccination of a person at risk for rabies.

† The deltoid area is the only acceptable site of vaccination for adults and older children. For younger children, the outer aspect of the thigh may be used. Vaccine should never be administered into the gluteal area.

† Any person with a history of preexposure vaccination with HDCV or RVA (Rabies Vaccine Adsorbed); prior postexposure prophylaxis with HDCV or RVA; or previous vaccination with any other type of rabies vaccine and a documented history of antibody response to the prior vaccination.

Table 4. Signs and Symptoms of Rabies in an Animal

Loss of appetite, excessive irritability or restlessness, unusual vocalizations, fever, trouble walking, paralysis (frequently beginning in the hind legs or throat), excessive salivation, tremors, convulsions, stupor, an unprovoked bite, extreme depression, or bizarre behavior.

Table 5. Rabies Consultation

Los Angeles County Department of Health Services Acute Communicable Disease Control (ACDC). For consultation regarding human rabies prophylaxis call ACDC at: (213) 240-7941.

Los Angeles County Department of Health Services Veterinary Services
For consultation regarding animal bite reports call: (562) 401-7088.

California Department of Health Services Veterinary Public Health Section: (916) 552-9740

Notes and References

This flowchart was designed based on New York City Department of Health guidelines (1).

The intent of this flowchart is to help physicians to evaluate possible rabies exposures occurring in Los Angeles County. **It is not meant to substitute for the best judgment of the physician who, with the patient, is clearly responsible for the final decision to administer-or not to administer-postexposure prophylaxis. Th**e information presented here has been abstracted from:

1. New York City Department of Health. A Decision Tree for Human Rabies Postexposure Prophylaxis. *City Health Information* 1992; 11:2-3.
2. Centers for Disease Control and Prevention. Rabies Prevention – United States, 1999: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR 1999; 48(RR-1);1-21*

WOUND MANAGEMENT

The need for active immunization (tetanus toxoid), with or without passive immunization (tetanus immune globulin [TIG]), depends on the condition of the wound and the patient's immunization history (see table below). Persons with wounds that are neither clean nor minor, and who have had 0-2 prior tetanus toxoid doses or have an uncertain history of prior doses, need TIG as well as Td. This is because early doses of toxoid do not induce immunity, but only prime the immune system. The TIG provides temporary immunity by directly providing antitoxin. This ensures that protective levels of antitoxin are achieved even if an immune response has not yet occurred.

For wounds of average severity, 250 units of TIG should be administered at a separate site and in a separate syringe from that used for accompanying Td.

The following table is a guide to active and passive tetanus immunization at the time of wound treatment or debridement. It presumes a reliable knowledge of the patient's immunization history.

TETANUS PROPHYLAXIS IN WOUND MANAGEMENT

HISTORY OF TETANUS IMMUNIZATION (DOSES)	CLEAN, MINOR WOUNDS		ALL OTHER WOUNDS[1]	
	Td[2]	TIG[3]	Td[2]	TIG[3]
Uncertain or less than 3	Yes	No	Yes	Yes
3 or more	No[4]	No	No[5,]	No[6]

[1] Such as, but not limited to, wounds contaminated with dirt, feces, soil, and saliva, puncture wounds, avulsions, and wounds resulting from missiles, crushing, burns, and frostbite.

[2] Use of Tetanus Toxoid (TT) without the diphtheria component is no longer recommended.[*] DTaP (or DT if pertussis vaccine is contraindicated) is recommended for children under 7 years of age. Adolescents and adults 11-64 years of age should receive Tdap instead of Td if they previously have not received Tdap. ([*] However, if TT and TIG are both used, use Tetanus Toxoid Adsorbed rather than Tetanus Toxoid for Booster Use Only [fluid vaccine].)

[3] TIG – Tetanus Immune Globulin. The recommended dose for wounds of average severity is 250 units intramuscularly (IM). When both Td and TIG are administered, use separate syringes and separate injection sites.

[4] Yes, if 10 years or more since last dose.

[5] Yes, if 5 years or more since last dose. More frequent boosters are not needed and can accentuate side effects. In addition, ACIP recommends that persons who experienced an Arthus reaction after a dose of tetanus toxoid-containing vaccine should not receive Td more frequently than every 10 years, even for tetanus prophylaxis as part of wound management (see next column, Reminder #4).

[6] Yes, if known to have a significant immune deficiency state (e.g., HIV, agammaglobulinemia), since immune response to tetanus toxoid may be suboptimal.

1. Regardless of immunization status, all wounds should be properly cleaned and debrided. Wounds should receive prompt medical treatment to remove all devitalized tissue and foreign material as an essential part of tetanus prophylaxis.

2. Enter any immunization administered on the patient's personal immunization record, or give the patient a notification of immunization for his/her record.

3. If a contraindication to using tetanus toxoid-containing preparations exists for a person who has not completed a primary series of tetanus toxoid immunization and that person has a wound that is neither clean nor minor, only passive immunization should be given using tetanus immune globulin (TIG).

4. An Arthus reaction associated with a vaccine that contained diphtheria toxoid without tetanus toxoid (e.g., MCV4), deferring Td (DTaP, DT, Tdap) might leave the person inadequately protected against tetanus and TT should be administered. In all circumstances, the decision to administer TIG is based on the primary vaccination history for tetanus.

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