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U.S. Public Health Service Recommendations

General Recommendations on Vaccination and Prophylaxis

The Advisory Committee on Immunization Practices (ACIP) makes immunization recommendations to the U.S. Public Health Service. Benefits and risks are associated with the use of all immunobiologics—no vaccine is completely effective or completely free of side effects. To achieve optimal levels of protection against vaccine-preventable diseases, the recommendations are based on scientific evidence of benefits and risks. The recommendations include information on general immunization issues and on the use of specific vaccines. When these recommendations are issued or revised, they are published in the [Morbidity and Mortality Weekly Report](#).

Table 1 –1. Recommended intervals between administration of antibody-containing products and measles-containing vaccine and varicella vaccine*

Indication	Dose	Recommended interval (months) before measles or varicella vaccination
Tetanus (TIG)	250 units (10 mg IgG/kg) IM†	3
Hepatitis A (IG), duration of international travel		
3 months or younger	0.02 mL/kg (3.3 mg IgG/kg) IM	3
over 3 months of age	0.06 mL/kg (10 mg IgG/kg) IM	3
Hepatitis B prophylaxis (HBIG)	0.06 mL/kg (10 mg IgG/kg) IM	3

[View enlarged table](#)

Vaccinations against diphtheria, tetanus, pertussis, measles, mumps, rubella, varicella, poliomyelitis, hepatitis B, *Haemophilus influenzae* type b, and pneumococcal invasive disease are routinely administered in the United States, usually in childhood. If travelers do not have a history of adequate protection against these diseases, immunizations appropriate to their age and previous immunization status should be obtained, whether or not international travel is planned. The childhood vaccination schedule changes annually, and recommendations for adolescents and adults change often. Immunization providers should obtain the most current schedules from the National Immunization Program website, <http://www.cdc.gov/nip/>. The text and Tables [1–1](#), [3–1](#), [3–3](#) through [3–8](#), [3–12](#), [3–15](#) through [3–16](#), [3–18](#) through [3–20](#), [6–3](#), [7–1](#) and [7–2](#) of this publication present recommendations for the use, number of doses, dose intervals, boosters, adverse reactions, precautions, and contraindications of vaccines and toxoids that may be indicated for travelers. For specific vaccines and toxoids, additional details on background, adverse reactions, precautions, and contraindications are found in the appropriate ACIP

statements.

Spacing of Immunobiologics

Multiple Doses of the Same Antigen

Some vaccines require more than one dose for adequate protection. The use of multiple reduced doses or the use of doses given at less than minimum intervals can lessen the antibody response. CDC does not endorse or recommend this practice, and such doses should not be counted as part of the vaccination series. The minimum interval between subsequent doses of vaccine is shown in [Table 1-1](#). **Except for oral typhoid vaccine, it is unnecessary to restart an interrupted series of a vaccine or toxoid or to add extra doses.** However, some products (tetanus and diphtheria toxoids) require periodic booster doses to maintain protection.

Simultaneous Administration

All commonly used vaccines can safely and effectively be given simultaneously (that is, on the same day) without impairing antibody responses or increasing rates of adverse reactions. This knowledge is particularly helpful for international travelers for whom exposure to several infectious diseases might be imminent.

In general, inactivated vaccines may be administered simultaneously at separate sites. However, when vaccines commonly associated with local or systemic reactions are given simultaneously, reactions can be accentuated. It is preferable to administer these vaccines on separate occasions.

Simultaneous administration of acellular pertussis (DTaP); inactivated poliovirus (IPV); *Haemophilus influenzae* type b (Hib); measles, mumps, and rubella (MMR); varicella; pneumococcal conjugate; and hepatitis B vaccines is encouraged for persons who are the recommended age to receive these vaccines and for whom no contraindications exist.

Yellow fever vaccine may be administered simultaneously with all other currently available vaccines.

Limited data suggest that the immunogenicity and safety of Japanese encephalitis (JE) vaccine are not compromised by simultaneous administration with DTaP or whole-cell pertussis (DTP) vaccine. No data exist on the effect of concurrent administration of other vaccines, drugs (e.g., chloroquine or mefloquine), or biologicals on the safety and immunogenicity of JE vaccine.

Inactivated vaccines generally do not interfere with the immune response to other inactivated or live virus vaccines. An inactivated vaccine may be given either simultaneously or at any time before or after a different inactivated vaccine or a live virus vaccine.

The immune response to an injected live virus vaccine (e.g., MMR, varicella, or yellow fever) might be impaired if administered within 28 days of another live virus vaccine. Whenever possible, injected live virus vaccines administered on different days should be given at least 28 days apart. If two injected live virus vaccines are not administered on the same day but <28 days apart, the second vaccine should be readministered at least 4 weeks later.

Live virus vaccines can interfere with a person's response to tuberculin testing. Tuberculin testing, if otherwise indicated, can be done on the day that live virus vaccines are administered or 4–6 weeks later.

Vaccination of Persons with Acute Illnesses

Every opportunity should be taken to provide appropriate vaccinations. The decision to delay

vaccination because of a current or recent acute illness depends on the severity of the symptoms and their cause. Although a moderate or severe acute illness is sufficient reason to postpone vaccination, minor illnesses (such as diarrhea, mild upper respiratory infection with or without low-grade fever, or other low-grade febrile illness) are not contraindications to vaccination. Antimicrobial therapy is not a contraindication to vaccination, except in some circumstances with oral typhoid vaccine (Ty21a). People with moderate or severe acute illness with or without fever should be vaccinated as soon as the condition has improved. This precaution is to avoid superimposing adverse effects from the vaccine on underlying illness or mistakenly attributing a manifestation of underlying illness to the vaccine.

Routine physical examinations or temperature measurements are not prerequisites for vaccinating anyone who appears to be in good health. Asking if a person is ill, postponing a vaccination for someone with moderate or severe acute illness, and vaccinating someone without contraindications are appropriate procedures in immunization programs.

Immune Globulin Preparations

When MMR and varicella vaccines are given with immune globulin (IG, formerly called immune serum globulin and immunoglobulin) preparations, antibody response can be diminished. IG preparations do not interfere with the immune response to yellow fever vaccine. The duration of inhibition of MMR and varicella vaccines is related to the dose of IG. Administration of MMR or its components and of varicella vaccines should be delayed 3–11 months after IG administration, depending on the type and quantity administered. Recommended intervals are shown in [Table 1–1](#).

IG administration may become necessary for another indication after MMR or its individual components and varicella vaccines have been given. In such a situation, the IG may interfere with the immune response to the MMR or varicella vaccines. Vaccine virus replication and stimulation of immunity usually occur 2–3 weeks after vaccination. If the interval between administration of one of these vaccines and the subsequent administration of an IG preparation is 14 days or more, the vaccine need not be readministered. If the interval is <14 days, the vaccine should be readministered after the interval shown in [Table 1–1](#), unless serologic testing indicates that antibodies have been produced. If administration of IG becomes necessary, MMR or its components and varicella vaccines can be administered simultaneously with IG, with the recognition that vaccine-induced immunity can be compromised. The vaccine should be administered in a body site different from that chosen for the IG injection. Vaccination should be repeated after the interval noted in [Table 1–1](#), unless serologic testing indicates antibodies have been produced.

When IG is given with the first dose of hepatitis A vaccine (HAV), the proportion of recipients who develop protective levels of antibody is not affected, but antibody concentrations are lower. Because the final concentrations of anti-HAV are many times higher than those considered protective, this reduced immunogenicity is not expected to be clinically important. IG preparations interact minimally with other inactivated vaccines and toxoids. Therefore, other inactivated vaccines may be given simultaneously or at any time interval after or before an antibody-containing blood product is used. However, such vaccines should be administered at different sites from the IG (not from each other).

Hypersensitivity to Vaccine Components

Vaccine components can cause allergic reactions in some recipients. These reactions can be local or systemic and can include anaphylaxis or anaphylactic-like responses. The vaccine components responsible can include the vaccine antigen, animal proteins, antibiotics, preservatives, or stabilizers. The most common animal protein allergen is egg protein in vaccines prepared by using embryonated chicken eggs (influenza and yellow fever vaccines). Generally,

people who can eat eggs or egg products safely may receive these vaccines, while people with histories of anaphylactic allergy (e.g., hives, swelling of the mouth and throat, difficulty breathing, hypotension, or shock) to eggs or egg proteins ordinarily should not. Screening people by asking whether they can eat eggs without adverse effects is a reasonable way to identify those who might be at risk from receiving yellow fever and influenza vaccines. Recent studies have indicated that other components in vaccines in addition to egg proteins (e.g., gelatin) may cause allergic reactions, including anaphylaxis in rare instances. Protocols have been developed for testing and vaccinating people with anaphylactic reactions to egg ingestion.

Some vaccines contain preservatives (e.g., thimerosal, a mercury compound) or trace amounts of antibiotics to which people might be allergic. Those administering the vaccine(s) should carefully review the information provided in the package insert before deciding if the rare person with such an allergy should receive the vaccine(s). No currently recommended vaccine contains penicillin or penicillin derivatives. Some vaccines (e.g., MMR and its individual component vaccines) contain trace amounts of neomycin or other antibiotics; the amount is less than would normally be used for the skin test to determine hypersensitivity. However, people who have experienced anaphylactic reactions to the antibiotic generally should not receive these vaccines. Most often, neomycin allergy is a contact dermatitis—a manifestation of a delayed-type (cell-mediated) immune response—rather than anaphylaxis. A history of delayed-type reactions to neomycin is not a contraindication to receiving these vaccines.

Reporting Adverse Events Following Immunization

Modern vaccines are extremely safe and effective. However, adverse events following immunization have been reported with all vaccines, ranging from frequent, minor, local reactions to extremely rare, severe, systemic illness such as paralysis associated with oral poliovirus vaccine (OPV). Information on side effects and adverse events following specific vaccines and toxoids are discussed in detail in each ACIP statement. Health-care providers are required by law to report selected adverse events occurring after vaccination with DTaP, diphtheria-tetanus (DT), tetanus-diphtheria (Td), MMR, measles-rubella (MR), measles, OPV, IPV, varicella, Hib, hepatitis B, pneumococcal conjugate, and yellow fever vaccines. (Reportable events are listed in [Morb Mortal Wkly Rep MMWR 1988;37\(13\):197–200](#) and, in general, are events usually requiring the recipient to seek medical attention.) These events and all temporally associated events following receipt of all other vaccines severe enough to require the recipient to seek medical attention should be reported to the Vaccine Adverse Event Reporting System (VAERS) (1-800-822-7967) maintained by the Centers for Disease Control and Prevention (CDC) and the U.S. Food and Drug Administration (FDA).

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