


**786 Outbreak Detection and Control** Clusters of cases of a vaccine-preventable disease detected in an institution, a medical practice, or a community may signal important changes in the pathogen, vaccine, or environment. Several factors can give rise to increases in vaccine-preventable disease, including (1) low rates of immunization that result in an accumulation of susceptible people (e.g., measles resurgence among vaccination abstainers); (2) changes in the infectious agent that permit it to escape vaccine-induced protection (e.g., non-vaccine-type pneumococci); (3) waning of vaccine-induced immunity (e.g., pertussis among adolescents and adults vaccinated in early childhood); and (4) point-source introductions of large inocula (e.g., food-borne exposure to hepatitis A virus). Reporting episodes of outbreak-prone diseases to public health authorities can facilitate recognition of clusters that require further interventions.

**PUBLIC HEALTH REPORTING** Recognition of suspected cases of diseases targeted for elimination or eradication—along with other diseases that require urgent public health interventions, such as contact tracing, administration of chemo- or immunoprophylaxis, or epidemiologic investigation for common-source exposure—is typically associated with special reporting requirements. Many diseases against which vaccines are routinely used, including measles, pertussis, *Haemophilus influenzae* type b invasive disease, and varicella, are nationally notifiable. Clinicians and laboratory staff have a responsibility to report some vaccine-preventable disease occurrences to local or state public health authorities according to specific case-definition criteria. All providers should be aware of state or city disease-reporting requirements and the best ways to contact public health authorities. A prompt response to vaccine-preventable disease outbreaks can greatly enhance the effectiveness of control measures.

 **GLOBAL CONSIDERATIONS** Several international health initiatives currently focus on reducing vaccine-preventable diseases in regions throughout the world. These efforts include improving access to new and underutilized vaccines, such as pneumococcal conjugate, rotavirus, human papillomavirus (HPV), and meningococcal A conjugate vaccines. The American Red Cross, the World Health Organization (WHO), the United Nations Foundation, the United Nations Children's Fund (UNICEF), and the Centers for Disease Control and Prevention (CDC) are partners in the Measles & Rubella Initiative, which targets reduction of worldwide measles deaths by 95% from 2000 to 2015. During 2000–2011, global measles mortality rates declined by 71%—i.e., from an estimated 548,000 deaths in 2000 to 158,000 deaths in 2011. Rotary International, UNICEF, the CDC, and the WHO are leading partners in the global eradication of polio, an endeavor that reduced the annual number of paralytic polio cases from 350,000 in 1988 to <250 in 2012. The GAVI Alliance and the Bill and Melinda Gates Foundation have brought substantial momentum to global efforts to reduce vaccine-preventable diseases, expanding on earlier efforts by the WHO, UNICEF, and governments in developed and developing countries.

**Enhancing Immunization in Adults** Although immunization has become a centerpiece of routine pediatric medical visits, it has not been as well integrated into routine health care visits for adults. This chapter focuses on immunization principles and vaccine use in adults. Accumulating evidence suggests that immunization coverage can be increased through efforts directed at consumer-, provider-, institution-, and system-level factors. The literature suggests that the application of multiple strategies is more effective at raising coverage rates than is the use of any single strategy.

**RECOMMENDATIONS FOR ADULT IMMUNIZATIONS** The CDC's Advisory Committee on Immunization Practices (ACIP) is the main source of recommendations for administration of vaccines approved by the U.S. Food and Drug Administration (FDA) for use in children and adults in the U.S. civilian population. The ACIP is a federal advisory committee that consists of 15 voting members (experts in fields associated with immunization) appointed by the Secretary of the U.S. Department of Health and Human Services; 8 ex officio members representing federal agencies; and 26 nonvoting representatives of various liaison

organizations, including major medical societies and managed-care organizations. The ACIP recommendations are available at [www.cdc.gov/vaccines/hcp/acip-recs/](http://www.cdc.gov/vaccines/hcp/acip-recs/). These recommendations are harmonized to the greatest extent possible with vaccine recommendations made by other organizations, including the American College of Obstetricians and Gynecologists, the American Academy of Family Physicians, and the American College of Physicians.

**ADULT IMMUNIZATION SCHEDULES** Immunization schedules for adults in the United States are updated annually and can be found online ([www.cdc.gov/vaccines/schedules/hcp/adult.html](http://www.cdc.gov/vaccines/schedules/hcp/adult.html)). In January, the schedules are published in *American Family Physician*, *Annals of Internal Medicine*, and *Morbidity and Mortality Weekly Report* ([www.cdc.gov/mmwr](http://www.cdc.gov/mmwr)). The adult immunization schedules for 2013 are summarized in **Fig. 148-1**. Additional information and specifications are contained in the footnotes to these schedules. In the time between annual publications, additions and changes to schedules are published as Notices to Readers in *Morbidity and Mortality Weekly Report*.

#### IMMUNIZATION PRACTICE STANDARDS

Administering immunizations to adults involves a number of processes, such as deciding whom to vaccinate, assessing vaccine contraindications and precautions, providing vaccine information statements (VISs), ensuring appropriate storage and handling of vaccines, administering vaccines, and maintaining vaccine records. In addition, provider reporting of adverse events that follow vaccination is an essential component of the vaccine safety monitoring system.

**Deciding Whom to Vaccinate** Every effort should be made to ensure that adults receive all indicated vaccines as expeditiously as possible. When adults present for care, their immunization history should be assessed and recorded, and this information should be used to identify needed vaccinations according to the most current version of the adult immunization schedule. Decision-support tools incorporated into electronic health records can provide prompts for needed vaccinations. Standing orders, which are often used for routinely indicated vaccines (e.g., influenza and pneumococcal vaccines), permit a nurse or another approved licensed practitioner to administer vaccines without a specific physician order, thus lowering barriers to adult immunization.

**Assessing Contraindications and Precautions** Before vaccination, all patients should be screened for contraindications and precautions. A *contraindication* is a condition that increases the risk of a serious adverse reaction to vaccination. A vaccine should not be administered when a contraindication is documented. For example, a history of an anaphylactic reaction to a dose of vaccine or to a vaccine component is a contraindication for further doses. A *precaution* is a condition that may increase the risk of an adverse event or that may compromise the ability of the vaccine to evoke immunity (e.g., administering measles vaccine to a person who has recently received a blood transfusion and may consequently have transient passive immunity to measles virus). Normally, a vaccine is not administered when a precaution is noted. However, situations may arise when the benefits of vaccination outweigh the estimated risk of an adverse event, and the provider may decide to vaccinate the patient despite the precaution.

In some cases, contraindications and precautions are temporary and may lead to mere deferral of vaccination until a later time. For example, moderate or severe acute illness with or without fever is generally considered a transient precaution to vaccination and results in postponement of vaccine administration until the acute phase has resolved; thus the superimposition of adverse effects of vaccination on the underlying illness and the mistaken attribution of a manifestation of the underlying illness to the vaccine are avoided. Contraindications and precautions to vaccines licensed in the United States for use in civilian adults are summarized in **Table 148-3**. It is important to recognize conditions that are *not* contraindications in order not to miss opportunities for vaccination. For example, in most cases, mild acute illness (with or without fever), a history of a mild to moderate local reaction to a previous dose of the vaccine, and breast-feeding are not contraindications to vaccination.