

ENA Topic Brief

Adult Immunizations

Key Information

- Immunizations are vital for disease prevention and health promotion.
- The CDC provides recommendations for adult immunizations.
- Information on vaccines are available at no cost from the CDC.
- Nurses should be knowledgeable about vaccine use and safety.
- A national vaccine surveillance system exists that track adverse events related to vaccines.

Purpose

The purpose of this ENA Topic Brief is to provide information about adult immunizations so that nurses are knowledgeable about recommended protection against vaccine-preventable diseases.

Immunizations are an excellent and effective way to protect oneself against many communicable diseases. Immunization schedules are often associated only with infants and children, but recommendations for adult immunizations are also available. The Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC) annually reviews and updates the Adult Immunization Schedule that is designed to inform health care providers about evidence-based guidelines regarding necessary immunizations.

Overview

The understanding of how immunity to disease is achieved has advanced significantly in the last century. Immunity is accomplished through the presence of antibodies—proteins produced by the body to destroy disease-carrying organisms. These antibodies are disease specific. Immunity can be produced actively by exposure to an actual disease or by introduction of a dead or weakened form of the disease-producing organism by vaccination. So, if the individual comes into contact with the same disease at a future point, the immune system recognizes the threat and produces specific antibodies against it. Immunity can also be achieved by a passive mechanism when an individual is given the antibodies to the disease rather than producing them. Passive immunity is immediate but only lasts for a short time. Individuals who do not have active immunity to a specific disease may have a protective barrier around them if a large population is present that has a high vaccination rate against that disease.¹ This may inhibit disease spread. Thus vaccination may not only protect the individual but others in the environment as well.

The information on immunity is incomplete without a look at the history of vaccines. The first successful vaccine was developed over two centuries ago to combat smallpox, which was a cause of epidemics worldwide. The success of this first vaccine in reducing disease spread and preventing staggering death rates from this communicable disease led the way for the development of new vaccines that remain in use today. Before the development and use of vaccines, millions of American children died from childhood diseases such as polio, diphtheria, and pertussis. These childhood diseases and many others are rarely seen due to the prevalence of immunization among children.

Front line effort in the continuing development of effective vaccines centers

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around the understanding of the battle between the human immune system and viral diseases. Viruses need a host to survive and are capable of continuing mutation and adaptation. This adaptation causes the virus to “look” different, so antibodies developed from a prior infection or vaccination may not effectively fight the presenting virus. Seasonal influenza is one of those viruses. It is a simple entity belonging to one of three main types—A, B, and C—but in common jargon all three are referred to as the “flu.” Certain strains of influenza have higher rates of serious complications than other strains.

Today vaccines are the most successful and cost-effective public health tools for preventing deaths from communicable disease.² Vaccines are recommended for adults on the basis of age, prior vaccinations, health conditions, lifestyle, occupation, and travel. Unfortunately, the incidence of vaccine preventable diseases in the United States is still high, and nearly 50,000 adults die annually from diseases that could have been prevented by vaccination.³ According to *Healthy People 2020*, vaccine-preventable diseases such as influenza and pneumococcal pneumonia continue to be leading causes of hospital admissions, medical costs, and morbidity and mortality.⁴ An optimal response to vaccine is dependent on multiple factors such as age or other medical conditions. In 2013, vaccines are available to protect children and adults against 17 diseases that can cause death and serious long-term disabilities such as paralysis, hearing loss, and infertility. Current levels of appropriate vaccination in the adult population remain low, and health care providers should routinely assess a patient’s vaccination history and immunization status.⁵ The current low vaccination rate in adults is compounded by an increase of global travel. Nurses’ attention to their personal immunization needs also is key to creating that “protective” pool of vaccinated individuals in the environment which can help inhibit communicable disease spread.

Adverse events do occur with vaccination just like they do occur with the use of any medication. Some of these adverse events may be considered as side effects of medication administration such as redness at the site of inoculation, low-grade fever, or muscle soreness. All vaccines are tested in clinical trials. There is a national vaccine safety surveillance program that collects and analyzes reports of adverse events that happen after vaccination. This *Vaccine Adverse Event Reporting System* (VAERS) is managed by both the CDC and the U.S. Food and Drug Administration.⁶ VAERS serves to alert scientists developing vaccines that a focused study may be needed to determine if the adverse event has a medical link to that particular vaccine. Anyone can submit a report to VAERS by accessing the website at <http://vaers.hhs.gov/esub/step1> and following the directions.

Many myths exist about the safety and effectiveness of vaccines. Nurses are frequently in an optimal position to have a fact filled conversation with patients related to the role of vaccination in preventing diseases, so they need to be knowledgeable about the role and need of vaccination. Accurate evidence based facts related to vaccine safety are available from the CDC. The CDC also provides research studies and fact sheets on vaccine-preventable diseases that address the common myths that appear in other sources.

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Tools

The 2013 ACIP recommendations for adult immunizations as well as the clarifying footnotes are provided. These recommendations must be read with the [footnotes](#) that follow.

Vaccine ↓	Age Group →	19–21 years	22–26 years	27–49 years	50–59 years	60–64 years	≥ 65 years
Influenza ^{2,*}		1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap) ^{3,*}		Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Varicella ^{4,*}		2 doses					
Human papillomavirus (HPV) Female ^{5,*}		3 doses					
Human papillomavirus (HPV) Male ^{5,*}		3 doses					
Zoster ⁶						1 dose	
Measles, mumps, rubella (MMR) ^{7,*}		1 or 2 doses					
Pneumococcal polysaccharide (PPSV23) ^{8,9}		1 or 2 doses					1 dose
Pneumococcal 13-valent conjugate (PCV13) ^{10,*}		1 dose					
Meningococcal ^{11,*}		1 or more doses					
Hepatitis A ^{12,*}		2 doses					
Hepatitis B ^{13,*}		3 doses					

*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster	Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)	Not routinely recommended
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Footnotes: **Additional information**

- Additional guidance for the use of the vaccines described in this supplement can be found in the [ACIP Recommendations](#).

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- Information on vaccination recommendations when vaccination status is unknown and other general immunization information can be found in the [General Recommendations on Immunization](#).
- Information on [travel vaccine requirements and recommendations](#) (e.g., for hepatitis A and B, meningococcal, and other vaccines).

2. Influenza vaccination

- Annual vaccination against influenza is recommended for all persons aged 6 months and older.
- Persons aged 6 months and older, including pregnant women, can receive the inactivated influenza vaccine (IIV).
- Healthy, nonpregnant persons aged 2–49 years without high-risk medical conditions can receive either intranasally administered live, attenuated influenza vaccine (LAIV) (FluMist), or IIV. Health-care personnel who care for severely immunocompromised persons (i.e., those who require care in a protected environment) should receive IIV rather than LAIV.
- The intramuscularly or intradermally administered IIV are options for adults aged 18–64 years.
- Adults aged 65 years and older can receive the standard dose IIV or the high-dose IIV (Fluzone High-Dose).

3. Diphtheria and tetanus toxoids and acellular pertussis (Td/Tdap) vaccine. (Minimum age: 6 weeks)

- Administer one dose of Tdap vaccine to pregnant women during each pregnancy (preferred during 27–36 weeks' gestation), regardless of number of years since prior Td or Tdap vaccination.
- Administer Tdap to all other adults who have not previously received Tdap or for whom vaccine status is unknown. Tdap can be administered regardless of interval since the most recent tetanus or diphtheria-toxoid containing vaccine.
- Adults with an unknown or incomplete history of completing a 3-dose primary vaccination series with Td-containing vaccines should begin or complete a primary vaccination series including a Tdap dose.
- For unvaccinated adults, administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second.
- For incompletely vaccinated (i.e., less than 3 doses) adults, administer remaining doses.
- Refer to the Advisory Committee on Immunization Practices (ACIP) statement for recommendations for administering Td/Tdap as prophylaxis in wound management (see [footnote #1](#)).

4. Varicella vaccination

- All adults without evidence of immunity to varicella (as defined below) should receive 2 doses of single-antigen varicella vaccine or a second dose if they have received only 1 dose.
- Special consideration for vaccination should be given to those who have close contact with persons at high risk for severe disease (e.g., health-care personnel and family contacts of persons with immunocompromising conditions) or are at high risk for exposure or transmission (e.g., teachers; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adolescents and adults living in households with children; nonpregnant women of childbearing age; and international travelers).
- Pregnant women should be assessed for evidence of varicella immunity. Women who do not have evidence of immunity should receive the first dose of varicella vaccine upon completion or termination of pregnancy and before discharge from the health-care facility. The second dose should be administered 4–8 weeks after the first dose.

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- Evidence of immunity to varicella in adults includes any of the following:
 - documentation of 2 doses of varicella vaccine at least 4 weeks apart;
 - U.S.-born before 1980 except health-care personnel and pregnant women;
 - history of varicella based on diagnosis or verification of varicella disease by a health-care provider;
 - history of herpes zoster based on diagnosis or verification of herpes zoster disease by a health-care provider; or
 - laboratory evidence of immunity or laboratory confirmation of disease.

5. Human papillomavirus (HPV) vaccination

- Two vaccines are licensed for use in females, bivalent HPV vaccine (HPV2) and quadrivalent HPV vaccine (HPV4), and one HPV vaccine for use in males (HPV4).
- For females, either HPV4 or HPV2 is recommended in a 3-dose series for routine vaccination at age 11 or 12 years, and for those aged 13 through 26 years, if not previously vaccinated.
- For males, HPV4 is recommended in a 3-dose series for routine vaccination at age 11 or 12 years, and for those aged 13 through 21 years, if not previously vaccinated. Males aged 22 through 26 years may be vaccinated.
- HPV4 is recommended for men who have sex with men (MSM) through age 26 years for those who did not get any or all doses when they were younger.
- Vaccination is recommended for immunocompromised persons (including those with HIV infection) through age 26 years for those who did not get any or all doses when they were younger.
- A complete series for either HPV4 or HPV2 consists of 3 doses. The second dose should be administered 1–2 months after the first dose; the third dose should be administered 6 months after the first dose (at least 24 weeks after the first dose).
- HPV vaccines are not recommended for use in pregnant women. However, pregnancy testing is not needed before vaccination. If a woman is found to be pregnant after initiating the vaccination series, no intervention is needed; the remainder of the 3-dose series should be delayed until completion of pregnancy.
- Although HPV vaccination is not specifically recommended for health-care personnel (HCP) based on their occupation, HCP should receive the HPV vaccine as recommended (see above).

6. Zoster vaccination

- A single dose of zoster vaccine is recommended for adults aged 60 years and older regardless of whether they report a prior episode of herpes zoster. Although the vaccine is licensed by the Food and Drug Administration (FDA) for use among and can be administered to persons aged 50 years and older, ACIP recommends that vaccination begins at age 60 years.
- Persons aged 60 years and older with chronic medical conditions may be vaccinated unless their condition constitutes a contraindication, such as pregnancy or severe immunodeficiency.
- Although zoster vaccination is not specifically recommended for HCP, they should receive the vaccine if they are in the recommended age group.

7. Measles, mumps, rubella (MMR) vaccination

- Adults born before 1957 generally are considered immune to measles and mumps. All adults born in 1957 or later should have documentation of 1 or more doses of MMR vaccine unless they have a medical contraindication to the

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vaccine, or laboratory evidence of immunity to each of the three diseases. Documentation of provider-diagnosed disease is not considered acceptable evidence of immunity for measles, mumps, or rubella.

Measles component:

- A routine second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who
 - are students in postsecondary educational institutions;
 - work in a health-care facility; or
 - plan to travel internationally.
- Persons who received inactivated (killed) measles vaccine or measles vaccine of unknown type during 1963–1967 should be revaccinated with 2 doses of MMR vaccine.

Mumps component:

- A routine second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who
 - are students in a postsecondary educational institution;
 - work in a health-care facility; or
 - plan to travel internationally.
- Persons vaccinated before 1979 with either killed mumps vaccine or mumps vaccine of unknown type who are at high risk for mumps infection (e.g., persons who are working in a health-care facility) should be considered for revaccination with 2 doses of MMR vaccine.

Rubella component:

- For women of childbearing age, regardless of birth year, rubella immunity should be determined. If there is no evidence of immunity, women who are not pregnant should be vaccinated. Pregnant women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the health-care facility.

HCP born before 1957:

- For unvaccinated health-care personnel born before 1957 who lack laboratory evidence of measles, mumps, and/or rubella immunity or laboratory confirmation of disease, health-care facilities should consider vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval for measles and mumps or 1 dose of MMR vaccine for rubella.

8. Pneumococcal polysaccharide (PPSV23) vaccination

- Vaccinate all persons with the following indications:
 - all adults aged 65 years and older;
 - adults younger than age 65 years with chronic lung disease (including chronic obstructive pulmonary disease, emphysema, and asthma); chronic cardiovascular diseases; diabetes mellitus; chronic renal failure; nephrotic syndrome; chronic liver disease (including cirrhosis); alcoholism; cochlear implants; cerebrospinal fluid leaks; immunocompromising conditions; and functional or anatomic asplenia (e.g., sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]);

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- residents of nursing homes or long-term care facilities; and
- adults who smoke cigarettes.
- Persons with immunocompromising conditions and other selected conditions are recommended to receive PCV13 and PPSV23 vaccines. See [footnote #10](#) for information on timing of PCV13 and PPSV23 vaccinations.
- Persons with asymptomatic or symptomatic HIV infection should be vaccinated as soon as possible after their diagnosis.
- When cancer chemotherapy or other immunosuppressive therapy is being considered, the interval between vaccination and initiation of immunosuppressive therapy should be at least 2 weeks. Vaccination during chemotherapy or radiation therapy should be avoided.
- Routine use of PPSV23 is not recommended for American Indians/Alaska Natives or other persons younger than age 65 years unless they have underlying medical conditions that are PPSV23 indications. However, public health authorities may consider recommending PPSV23 for American Indians/Alaska Natives who are living in areas where the risk for invasive pneumococcal disease is increased.
- When indicated, PPSV23 should be administered to patients who are uncertain of their vaccination status and there is no record of previous vaccination. When PCV13 is also indicated, a dose of PCV13 should be given first (see [footnote #10](#)).

9. Revaccination with PPSV23

- One-time revaccination 5 years after the first dose is recommended for persons aged 19 through 64 years with chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); and for persons with immunocompromising conditions.
- Persons who received 1 or 2 doses of PPSV23 before age 65 years for any indication should receive another dose of the vaccine at age 65 years or later if at least 5 years have passed since their previous dose.
- No further doses are needed for persons vaccinated with PPSV23 at or after age 65 years.

10. Pneumococcal conjugate 13-valent vaccination (PCV13)

- Adults aged 19 years or older with immunocompromising conditions (including chronic renal failure and nephrotic syndrome), functional or anatomic asplenia, CSF leaks or cochlear implants, and who have not previously received PCV13 or PPSV23 should receive a single dose of PCV13 followed by a dose of PPSV23 at least 8 weeks later.
- Adults aged 19 years or older with the aforementioned conditions who have previously received one or more doses of PPSV23 should receive a dose of PCV13 one or more years after the last PPSV23 dose was received. For those that require additional doses of PPSV23, the first such dose should be given no sooner than 8 weeks after PCV13 and at least 5 years since the most recent dose of PPSV23.
- When indicated, PCV13 should be administered to patients who are uncertain of their vaccination status history and there is no record of previous vaccination.
- Although PCV13 is licensed by the Food and Drug Administration (FDA) for use among and can be administered to persons aged 50 years and older, ACIP recommends PCV13 for adults aged 19 years and older with the specific medical conditions noted above.

11. Meningococcal vaccination

- Administer 2 doses of meningococcal conjugate vaccine quadrivalent (MCV4) at least 2 months apart to adults with functional asplenia or persistent complement component deficiencies.
- HIV-infected persons who are vaccinated also should receive 2 doses.

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- Administer a single dose of meningococcal vaccine to microbiologists routinely exposed to isolates of *Neisseria meningitidis*, military recruits, and persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic.
- First-year college students up through age 21 years who are living in residence halls should be vaccinated if they have not received a dose on or after their 16th birthday.
- MCV4 is preferred for adults with any of the preceding indications who are aged 55 years and younger; meningococcal polysaccharide vaccine (MPSV4) is preferred for adults aged 56 years and older.
- Revaccination with MCV4 every 5 years is recommended for adults previously vaccinated with MCV4 or MPSV4 who remain at increased risk for infection (e.g., adults with anatomic or functional asplenia or persistent complement component deficiencies).

12. Hepatitis A vaccination

- a. Vaccinate any person seeking protection from hepatitis A virus (HAV) infection and persons with any of the following indications:
 - i. men who have sex with men and persons who use injection or noninjection illicit drugs;
 - ii. persons working with HAV-infected primates or with HAV in a research laboratory setting;
 - iii. persons with chronic liver disease and persons who receive clotting factor concentrates;
 - iv. persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A; and
 - v. unvaccinated persons who anticipate close personal contact (e.g., household or regular babysitting) with an international adoptee during the first 60 days after arrival in the United States from a country with high or intermediate endemicity. (See [footnote #1](#) for more information on travel recommendations). The first dose of the 2-dose hepatitis A vaccine series should be administered as soon as adoption is planned, ideally 2 or more weeks before the arrival of the adoptee.
- b. Single-antigen vaccine formulations should be administered in a 2-dose schedule at either 0 and 6–12 months (Havrix), or 0 and 6–18 months (Vaqta). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, administer 3 doses at 0, 1, and 6 months; alternatively, a 4-dose schedule may be used, administered on days 0, 7, and 21–30, followed by a booster dose at month 12.

13. Hepatitis B vaccination

- a. Vaccinate persons with any of the following indications and any person seeking protection from hepatitis B virus (HBV) infection:
 - i. sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than one sex partner during the previous 6 months); persons seeking evaluation or treatment for a sexually transmitted disease (STD); current or recent injection-drug users; and men who have sex with men;
 - ii. health-care personnel and public-safety workers who are potentially exposed to blood or other infectious body fluids;
 - iii. persons with diabetes younger than age 60 years as soon as feasible after diagnosis; persons with diabetes who are age 60 years or older at the discretion of the treating clinician based on increased need for assisted blood glucose monitoring in long-term care facilities, likelihood of acquiring hepatitis B infection, its complications or chronic sequelae, and likelihood of immune response to vaccination;
 - iv. persons with end-stage renal disease, including patients receiving hemodialysis; persons with HIV infection; and persons with chronic liver disease;

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- v. household contacts and sex partners of hepatitis B surface antigenpositive persons; clients and staff members of institutions for persons with developmental disabilities; and international travelers to countries with high or intermediate prevalence of chronic HBV infection; and
 - vi. all adults in the following settings: STD treatment facilities; HIV testing and treatment facilities; facilities providing drug-abuse treatment and prevention services; health-care settings targeting services to injection-drug users or men who have sex with men; correctional facilities; end-stage renal disease programs and facilities for chronic hemodialysis patients; and institutions and nonresidential daycare facilities for persons with developmental disabilities.
- b. Administer missing doses to complete a 3-dose series of hepatitis B vaccine to those persons not vaccinated or not completely vaccinated. The second dose should be administered 1 month after the first dose; the third dose should be given at least 2 months after the second dose (and at least 4 months after the first dose). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, give 3 doses at 0, 1, and 6 months; alternatively, a 4-dose Twinrix schedule, administered on days 0, 7, and 21–30 followed by a booster dose at month 12 may be used.
- c. Adult patients receiving hemodialysis or with other immunocompromising conditions should receive 1 dose of 40 µg/mL (Recombivax HB) administered on a 3-dose schedule at 0, 1, and 6 months or 2 doses of 20 µ/mL (Engerix-B) administered simultaneously on a 4-dose schedule at 0, 1, 2, and 6 months.

Conclusion

Immunization rates for adults are less than adequate and lack of knowledge about the safety and efficacy of current vaccines may contribute to the failure of adults to seek appropriate level of protection against vaccine-preventable diseases. The 2013 recommendations for adult immunizations with the explanatory footnotes should be reviewed by all individuals who need to make an informed choice about immunizations for themselves and those recommended for their patients.

Definitions of Terms

Adult: 19 years of age and older per CDC immunization guidelines.

Immunization: The process by which a person becomes protected against a disease.

Vaccine: A product that produces immunity therefore protecting the body from a disease.

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Developed: 2013.

Approved by the ENA Board of Directors: July, 2013.

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