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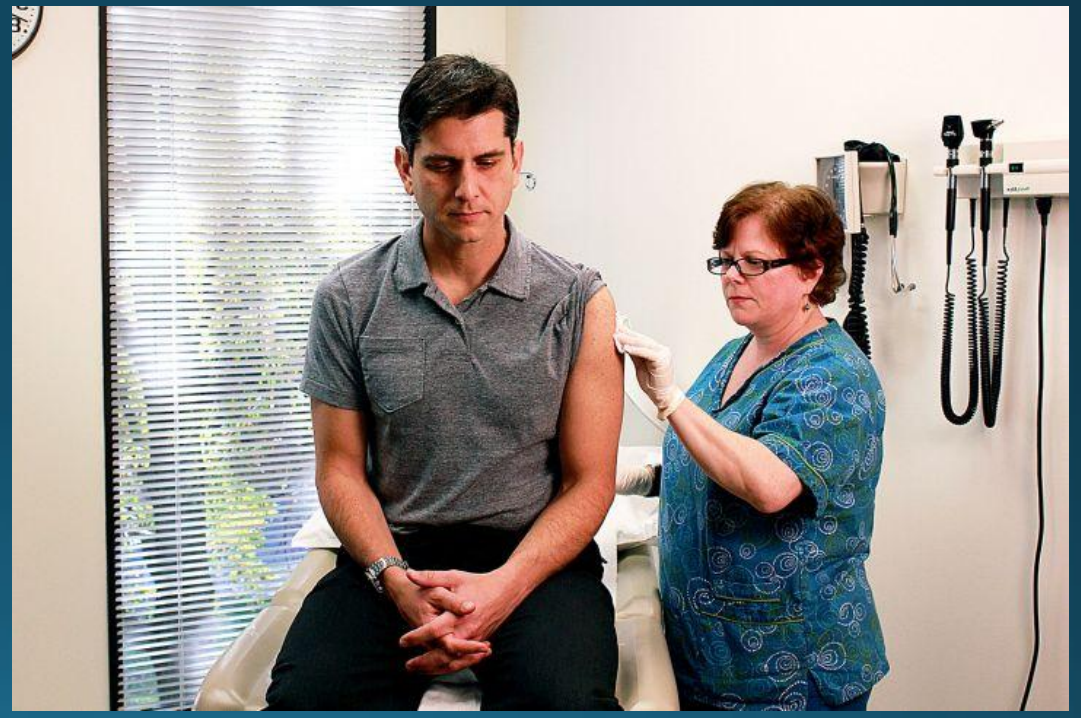
Update on Adult Vaccines

Topics for the Evening

- Vaccine Safety
- Vaccine Coverage
- Influenza Vaccine
- Pneumococcal Vaccine
- Tetanus/Diphtheria/Pertussis Vaccine
- Zoster Vaccine
- Routine vs. Conditions
- Question and Answer

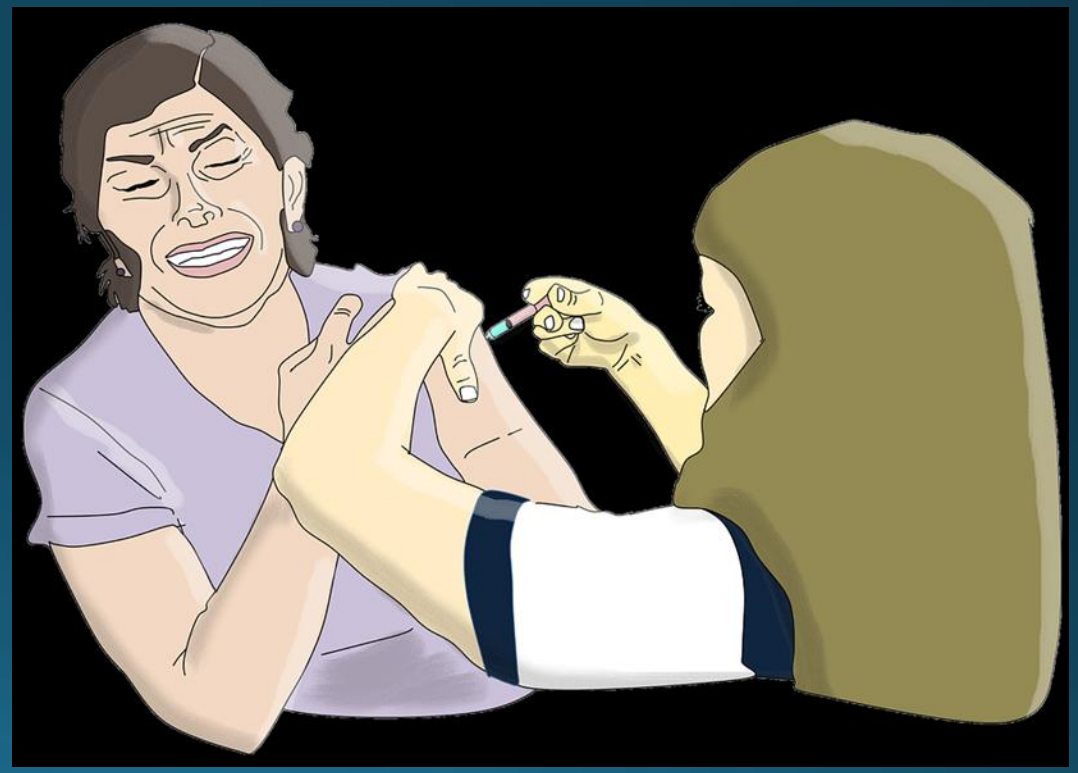


Disclaimer

- I am a member of the Adult Immunizations Workgroup of the Advisory Committee on Immunization Practices. Materials provided in this presentation reflect my individual views only and do not represent the views or recommendations of the ACIP except where noted on individual slides. The overall presentation should not be attributed to the ACIP.

Vaccine Safety

- Vaccines prevent diseases.
- Vaccines, like any medicine or procedure, have adverse effects.
- Vaccines benefits outweigh their harms.
- Communication about vaccines has gotten more difficult.



Vaccine Safety Mechanisms

- Vaccine Adverse Events Reporting System (VAERS)
  - Anyone can report
- Vaccine Safety Datalink
  - Used to test problems
- National Vaccine Injury Compensation Program
  - “no fault” fund

VAERS

Vaccine Adverse Event Reporting System

Search web site:

Search

Report an Adverse Event | About VAERS | VAERS Data | Vaccine Resources | Information for Healthcare Professionals | Information for U.S. States and Territories | Information for Vaccine Manufacturers

The **Vaccine Adverse Event Reporting System (VAERS)** is a national vaccine safety surveillance program co-sponsored by the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA). VAERS is a post-marketing safety surveillance program, collecting information about adverse events (possible side effects) that occur after the administration of vaccines licensed for use in the United States.

VAERS provides a nationwide mechanism by which adverse events following immunization may be reported, analyzed, and made available to the public. VAERS also provides a vehicle for disseminating vaccine safety-related information to parents and guardians, health care providers, vaccine manufacturers, state vaccine programs, and other constituencies. more...

This Web site is best viewed on Internet Explorer version 11.0. IE browsers 10 and below **may** not be supported. Download the latest IE browser here.

Have you or your child had a reaction following vaccination?

1. Contact your health care provider
2. Report the reaction
3. Submit Follow-Up Information
4. Visit the National Vaccine Injury Compensation (if appropriate)

Important note: CDC and FDA do not provide individual medical treatment, advice, or diagnosis. If you need individual medical or health care advice, consult a qualified health care provider.

¿Ha tenido usted o su hijo una reacción adversa después de recibir una vacuna?

1. Contacte a su proveedor de salud
2. Reporte una reacción adversa
3. Visite el Programa Nacional de Compensación por Daños Derivados de Vacunas (si es necesario)

Search VAERS Data

VAERS Data last updated: **08/16/2016**

Featured Resources

Seasonal Flu Update

- Summary of 2015-2016 Influenza Vaccine Information

Government Agencies

- Immunization Safety Office
- National Center for Immunization and Respiratory Diseases
- National Vaccine Injury

Vaccine Coverage

- ACA
  - Coverage by new plans of ALL vaccines without co-payment.
- Medicare:
  - Through Part B
    - Influenza
    - Hepatitis B
    - Pneumococcal (two)
  - Through Part D
    - "Everything" (Tdap, HPV, Zoster)

Influenza Vaccine

- Recommended yearly for everyone over 6 months of age (unless contraindicated)
- Which one?
  - LAIV NOT recommended
  - Inactivated influenza vaccine vs. recombinant influenza vaccine
  - High-dose influenza vaccine?

Pneumococcal Vaccine

- Not just about pneumonia
- Two types: PPSV23 and PCV13
- Over 65: PCV13 then PPSV23 1 year later
- Medical conditions:
  - Serious immune compromise: PCV13 then PPSV23
  - Most other indications: PPSV23, repeat in 5 years.

Tetanus/Diphtheria/Pertussis Vaccine

- Tetanus/Diphtheria – every 10 years
- Pertussis outbreaks
- Tdap – once (except pregnancy)
- Cocooning

Zoster Vaccine

- Zoster = Herpes Zoster = Varicella-Zoster virus = Shingles
- Reactivated chicken pox (but we don't need to prove that)
- Ask your insurance about coverage

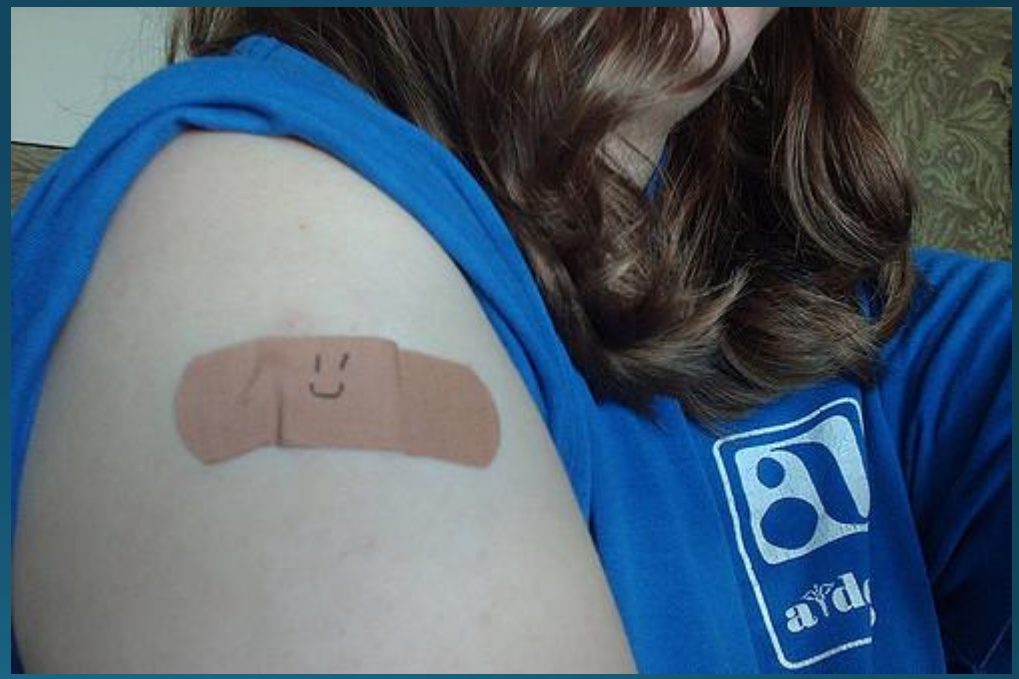
Routine vs. "Conditions"

- Routine = Age-based recommendations

- "Conditions" = HALO
  - Health – diabetes, immune compromise
  - Age - ("routine")
  - Lifestyle – tobacco, sexual practices, travel
  - Occupational/Other – health care, college/military
  - TALK TO YOUR PRIMARY CARE CLINICIAN!

The Schedule

- New schedule every February



Recommended Adult Immunization Schedule—United States - 2016

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

Figure 1. Recommended immunization schedule for adults aged 19 years or older, by vaccine and age group[1]

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 Tdap for Td once, then Td booster 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 depending on indication					
Pneumococcal 13-valent conjugate (PCV13)[*,8]	1 dose					
Pneumococcal 23-valent polysaccharide (PPSV23)[8]	1 or 2 doses depending on indication					1 dose
Hepatitis A[*,9]	2 or 3 doses depending on vaccine					
Hepatitis B[*,10]	3 doses					
Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)[*,11]	1 or more doses depending on indication					
Meningococcal B (MenB)[11]	2 or 3 doses depending on vaccine					
Haemophilus influenzae type b (Hib)[*,12]	1 or 3 doses depending on indication					

*Covered by the Vaccine Injury Compensation Program

- Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster
- Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)
- No recommendation

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967.

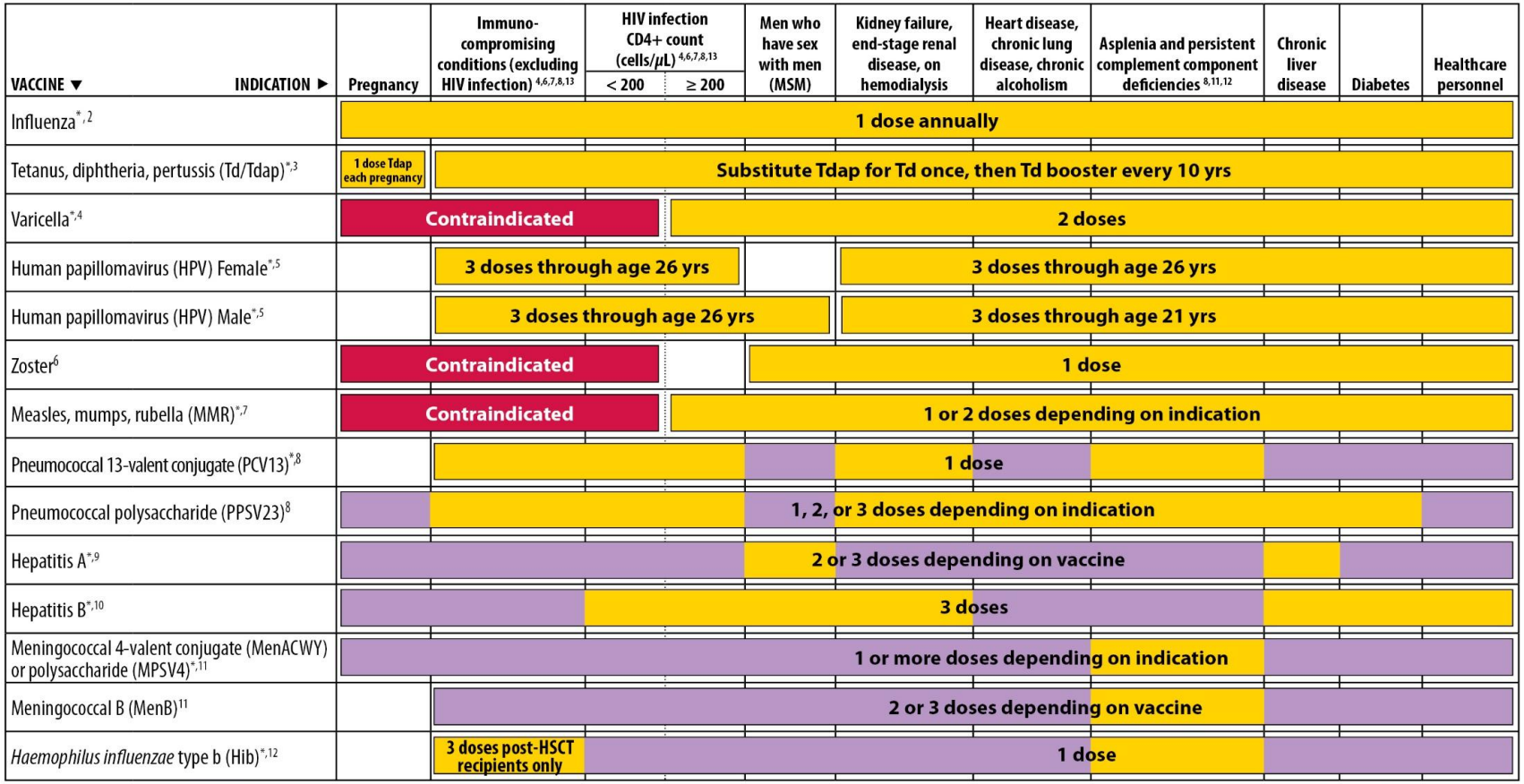
Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-6400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. - 8:00 p.m. Eastern Time, Monday - Friday, excluding holidays.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the America College of Physicians (ACP), the American College of Obstetricians and Gynecologists (ACOG) and the American College of Nurse-Midwives (ACNM).

Figure 2. Vaccines that might be indicated for adults aged 19 years or older based on medical and other indications[1]



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Recommended for all persons who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection; zoster vaccine is recommended regardless of past episode of zoster

Recommended for persons with a risk factor (medical, occupational, lifestyle, or other indication)

No recommendation

Contraindicated

These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly recommended for adults aged ≥19 years, as of February 2016. For all vaccines being recommended on the Adult Immunization Schedule: a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/hcp/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

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

Footnotes—Recommended Immunization Schedule for Adults Aged 19 Years or Older: United States, 2016

1. Additional information
- Additional guidance for the use of the vaccines described in this supplement is available at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- Information on vaccination recommendations when vaccination status is unknown and other general immunization information can be found in the General Recommendations on Immunization at www.cdc.gov/mmwr/preview/mmwrhtml/rr6002a1.htm.
- Information on travel vaccine requirements and recommendations (e.g., for hepatitis A and B, meningococcal, and other vaccines) is available at wwwnc.cdc.gov/travel/destinations/list.
- Additional information and resources regarding vaccination of pregnant women can be found at www.cdc.gov/vaccines/adults/rec-vac/pregnant.html.

2. Influenza vaccination
- Annual vaccination against influenza is recommended for all persons aged ≥6 months. A list of currently available influenza vaccines can be found at http://www.cdc.gov/flu/protect/vaccine/vaccines.htm.
- Persons aged ≥6 months, including pregnant women, can receive the inactivated influenza vaccine (IIV). An age-appropriate IIV formulation should be used.
- Intradermal IIV is an option for persons aged 18 through 64 years.
- High-dose IIV is an option for persons aged ≥65 years.
- Live attenuated influenza vaccine (LAIV [FluMist]) is an option for healthy, non-pregnant persons aged 2 through 49 years.
- Recombinant influenza vaccine (RIV [Flublok]) is approved for persons aged ≥18 years.
- RIV, which does not contain any egg protein, may be administered to persons aged ≥18 years with egg allergy of any severity; IIV may be used with additional safety measures for persons with hives-only allergy to eggs.
- Health care personnel who care for severely immunocompromised persons who require care in a protected environment should receive IIV or RIV; health care personnel who receive LAIV should avoid providing care for severely immunosuppressed persons for 7 days after vaccination.

3. Tetanus, diphtheria, and acellular pertussis (Td/Tdap) vaccination
- Administer 1 dose of Tdap vaccine to pregnant women during each pregnancy (preferably during 27–36 weeks' gestation) regardless of interval since prior Td or Tdap vaccination.
- Persons aged ≥11 years who have not received Tdap vaccine or for whom vaccine status is unknown should receive a dose of Tdap followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter. 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 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.
- Vaccination should be emphasized for 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.
- 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
- Three HPV vaccines are licensed for use in females (bivalent HPV vaccine [2vHPV], quadrivalent HPV vaccine [4vHPV], and 9-valent HPV vaccine [9vHPV]) and two HPV vaccines are licensed for use in males (4vHPV and 9vHPV).
- For females, 2vHPV, 4vHPV, or 9vHPV 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, 4vHPV or 9vHPV 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.
- HPV vaccination is recommended for men who have sex with men through age 26 years 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 who did not get any or all doses when they were younger.
- A complete HPV vaccination series consists of 3 doses. The second dose should be administered 4–8 weeks (minimum interval of 4 weeks) after the first dose; the third dose should be administered 24 weeks after the first dose and 16 weeks after the second dose (minimum interval of 12 weeks).
- 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 or termination of pregnancy.

6. Zoster vaccination
- A single dose of zoster vaccine is recommended for adults aged ≥60 years regardless of whether they report a prior episode of herpes zoster. Although the vaccine is licensed by the U.S. Food and Drug Administration for use among and can be administered to persons aged ≥50 years, ACIP recommends that vaccination begin at age 60 years.
- Persons aged ≥60 years with chronic medical conditions may be vaccinated unless their condition constitutes a contraindication, such as pregnancy or severe immunodeficiency.

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

Health care personnel born before 1957:
- For unvaccinated health care personnel born before 1957 who lack laboratory evidence of measles, mumps, and/or rubella immunity or laboratory confirmation of disease, health care facilities should 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 vaccination
- General information
  - Adults are recommended to receive 1 dose of 13-valent pneumococcal conjugate vaccine (PCV13) and 1, 2, or 3 doses (depending on indication) of 23-valent pneumococcal polysaccharide vaccine (PPSV23).
  - PCV13 should be administered at least 1 year after PPSV23.
  - PPSV23 should be administered at least 1 year after PCV13, except among adults with immunocompromising conditions, anatomical or functional asplenia, cerebrospinal fluid leak, or cochlear implant, for whom the interval should be at least 8 weeks; the interval between PPSV23 doses should be at least 5 years.
  - No additional dose of PPSV23 is indicated for adults vaccinated with PPSV23 at age ≥65 years.
  - When both PCV13 and PPSV23 are indicated, PCV13 should be administered first; PCV13 and PPSV23 should not be administered during the same visit.
  - When indicated, PCV13 and PPSV23 should be administered to adults whose pneumococcal vaccination history is incomplete or unknown.
- Adults aged ≥65 years (immunocompetent) who:
  - have not received PCV13 or PPSV23: administer PCV13 followed by PPSV23 at least 1 year after PCV13.
  - have not received PCV13 but have received a dose of PPSV23 at age ≥65 years: administer PCV13 at least 1 year after PPSV23.
  - have not received PCV13 but have received 1 or more doses of PPSV23 at age <65 years: administer PCV13 at least 1 year after the most recent dose of PPSV23. Administer a dose of PPSV23 at least 1 year after PCV13 and at least 5 years after the most recent dose of PPSV23.
  - have received PCV13 but not PPSV23 at age <65 years: administer PPSV23 at least 1 year after PCV13.
  - have received PCV13 and 1 or more doses of PPSV23 at age <65 years: administer PPSV23 at least 1 year after PCV13 and at least 5 years after the most recent dose of PPSV23.
- Adults aged ≥19 years with immunocompromising conditions or anatomical or functional asplenia (defined below) who:
  - have not received PCV13 or PPSV23: administer PCV13 followed by PPSV23 at least 8 weeks after PCV13. Administer a second dose of PPSV23 at least 5 years after the first dose of PPSV23.
  - have not received PCV13 but have received 1 dose of PPSV23: administer PCV13 at least 1 year after the PPSV23. Administer a second dose of PPSV23 at least 8 weeks after PCV13 and at least 5 years after the first dose of PPSV23.

(Continued on next page)

Footnotes—Recommended Immunization Schedule for Adults Aged 19 Years or Older: United States, 2016

- have not received PCV13 but have received 2 doses of PPSV23: administer PCV13 at least 1 year after the most recent dose of PPSV23.
- have received PCV13 but not PPSV23: administer PPSV23 at least 8 weeks after PCV13. Administer a second dose of PPSV23 at least 5 years after the first dose of PPSV23.
- have received PCV13 and 1 dose of PPSV23: administer a second dose of PPSV23 at least 8 weeks after PCV13 and at least 5 years after the first dose of PPSV23.
- If the most recent dose of PPSV23 was administered at age <65 years, at age ≥65 years, administer a dose of PPSV23 at least 8 weeks after PCV13 and at least 5 years after the last dose of PPSV23.
- Immunocompromising conditions that are indications for pneumococcal vaccination are: congenital or acquired immunodeficiency (including B- or T-lymphocyte deficiency, complement deficiencies, and phagocytic disorders excluding chronic granulomatous disease), HIV infection, chronic renal failure, nephrotic syndrome, leukemia, lymphoma, Hodgkin disease, generalized malignancy, multiple myeloma, solid organ transplant, and iatrogenic immunosuppression (including long-term systemic corticosteroids and radiation therapy).
- Anatomical or functional asplenia that are indications for pneumococcal vaccination are: sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, and splenectomy. Administer pneumococcal vaccines at least 2 weeks before immunosuppressive therapy or an elective splenectomy, and as soon as possible to adults who are newly diagnosed with asymptomatic or symptomatic HIV infection.

- Adults aged ≥19 years with cerebrospinal fluid leaks or cochlear implants: administer PCV13 followed by PPSV23 at least 8 weeks after PCV13; no additional dose of PPSV23 is indicated if aged <65 years. If PPSV23 was administered at age <65 years, at age ≥65 years, administer another dose of PPSV23 at least 5 years after the last dose of PPSV23.
- Adults aged 19 through 64 years with chronic heart disease (including congestive heart failure and cardiomyopathies, excluding hypertension), chronic lung disease (including chronic obstructive lung disease, emphysema, and asthma), chronic liver disease (including cirrhosis), alcoholism, or diabetes mellitus, or who smoke cigarettes: administer PPSV23. At age ≥65 years, administer PCV13 at least 1 year after PPSV23, followed by another dose of PPSV23 at least 1 year after PCV13 and at least 5 years after the last dose of PPSV23.
- Routine pneumococcal vaccination is not recommended for American Indian/Alaska Native or other adults unless they have an indication as above; however, public health authorities may consider recommending the use of pneumococcal vaccines for American Indians/Alaska Natives or other adults who live in areas with increased risk for invasive pneumococcal disease.

9. Hepatitis A vaccination

- Vaccinate any person seeking protection from hepatitis A virus (HAV) infection and persons with any of the following indications:
  - men who have sex with men;
  - persons who use injection or noninjection illicit drugs;
  - persons working with HAV-infected primates or with HAV in a research laboratory setting;
  - persons with chronic liver disease and persons who receive clotting factor concentrates;
  - persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (see footnote 1); and
  - 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 of hepatitis A (see footnote 1). 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.
- 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 12 months.

10. Hepatitis B vaccination

- Vaccinate any person seeking protection from hepatitis B virus (HBV) infection and persons with any of the following indications:
  - sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than 1 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;
  - health care personnel and public safety workers who are potentially exposed to blood or other infectious body fluids;
  - persons who are aged <60 years with diabetes as soon as feasible after diagnosis; persons with diabetes who are aged ≥60 years at the discretion of the treating clinician based on the likelihood of acquiring HBV infection, including the risk posed by an increased need for assisted blood glucose monitoring in long-term care facilities, the likelihood of experiencing chronic sequelae if infected with HBV, and the likelihood of immune response to vaccination;
  - persons with end-stage renal disease (including patients receiving hemodialysis), persons with HIV infection, and persons with chronic liver disease;
  - household contacts and sex partners of hepatitis B surface antigen–positive persons, clients and staff members of institutions for persons with developmental disabilities, and international travelers to regions with high or intermediate levels of endemic HBV infection (see footnote 1); and
  - all adults in the following settings: STD treatment facilities, HIV testing and treatment facilities, facilities providing drug abuse treatment and prevention services, health care settings targeting services to injection drug users or men who have sex with men, correctional facilities, end-stage renal disease programs and facilities for chronic hemodialysis patients, and institutions and nonresidential day care facilities for persons with developmental disabilities.
- 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 at least 1 month after the first dose; the third dose should be administered 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 may be used, administered on days 0, 7, and 21–30, followed by a booster dose at 12 months.
- Adult patients receiving hemodialysis or with other immunocompromising conditions should receive 1 dose of 40 mcg/mL (Recombivax HB) administered on a 3-dose schedule at 0, 1, and 6 months or 2 doses of 20 mcg/mL (Engerix-B) administered simultaneously on a 4-dose schedule at 0, 1, 2, and 6 months.

11. Meningococcal vaccination

- General information
  - Serogroup A, C, W, and Y meningococcal vaccine is available as a conjugate (MenACWY [Menactra, Menveo]) or a polysaccharide (MPSV4 [Menomune]) vaccine.
  - Serogroup B meningococcal (MenB) vaccine is available as a 2-dose series of MenB-4C vaccine (Bexsero) administered at least 1 month apart or a 3-dose series of MenB-FHbp (Trumenba) vaccine administered at 0, 2, and 6 months; the two MenB vaccines are not interchangeable, i.e., the same MenB vaccine product must be used for all doses.
  - MenACWY vaccine is preferred for adults with serogroup A, C, W, and Y meningococcal vaccine indications who are aged ≤55 years, and for adults aged ≥56 years: 1) who were vaccinated previously with MenACWY vaccine and are recommended for revaccination or 2) for whom multiple doses of vaccine are anticipated; MPSV4 vaccine is preferred for adults aged ≥56 years who have not received MenACWY vaccine previously and who require a single dose only (e.g., persons at risk because of an outbreak).
  - Revaccination with MenACWY vaccine every 5 years is recommended for adults previously vaccinated with MenACWY or MPSV4 vaccine who remain at increased risk for infection (e.g., adults with anatomical or functional asplenia or persistent complement component deficiencies, or microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*).
  - MenB vaccine is approved for use in persons aged 10 through 25 years; however, because there is no theoretical difference in safety for persons aged >25 years compared to those aged 10 through 25 years, MenB vaccine is recommended for routine use in persons aged ≥10 years who are at increased risk for serogroup B meningococcal disease.
  - There is no recommendation for MenB revaccination at this time.
  - MenB vaccine may be administered concomitantly with MenACWY vaccine but at a different anatomic site, if feasible.
  - HIV infection is not an indication for routine vaccination with MenACWY or MenB vaccine; if an HIV-infected person of any age is to be vaccinated, administer 2 doses of MenACWY vaccine at least 2 months apart.
- Adults with anatomical or functional asplenia or persistent complement component deficiencies: administer 2 doses of MenACWY vaccine at least 2 months apart and revaccinate every 5 years. Also administer a series of MenB vaccine.
- Microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*: administer a single dose of MenACWY vaccine; revaccinate with MenACWY vaccine every 5 years if remain at increased risk for infection. Also administer a series of MenB vaccine.
- Persons at risk because of a meningococcal disease outbreak: if the outbreak is attributable to serogroup A, C, W, or Y, administer a single dose of MenACWY vaccine; if the outbreak is attributable to serogroup B, administer a series of MenB vaccine.
- Persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic: administer a single dose of MenACWY vaccine and revaccinate with MenACWY vaccine every 5 years if the increased risk for infection remains (see footnote 1); MenB vaccine is not recommended because meningococcal disease in these countries is generally not caused by serogroup B.
- Military recruits: administer a single dose of MenACWY vaccine.
- First-year college students aged ≤21 years who live in residence halls: administer a single dose of MenACWY vaccine if they have not received a dose on or after their 16th birthday.
- Young adults aged 16 through 23 years (preferred age range is 16 through 18 years): may be vaccinated with a series of MenB vaccine to provide short-term protection against most strains of serogroup B meningococcal disease.

12. *Haemophilus influenzae* type b (Hib) vaccination

- One dose of Hib vaccine should be administered to persons who have anatomical or functional asplenia or sickle cell disease or are undergoing elective splenectomy if they have not previously received Hib vaccine. Hib vaccination 14 or more days before splenectomy is suggested.
- Recipients of a hematopoietic stem cell transplant (HSCT) should be vaccinated with a 3-dose regimen 6–12 months after a successful transplant, regardless of vaccination history; at least 4 weeks should separate doses.
- Hib vaccine is not recommended for adults with HIV infection since their risk for Hib infection is low.

13. Immunocompromising conditions

- Inactivated vaccines (e.g., pneumococcal, meningococcal, and inactivated influenza vaccines) generally are acceptable and live vaccines generally should be avoided in persons with immune deficiencies or immunocompromising conditions. Information on specific conditions is available at www.cdc.gov/vaccines/hcp/acip-recs/index.html.

Questions and Answers