Updates – 2018 Adult Immunization Schedule

- Zoster vaccination (Oct 2017)
  - HZ/su is recommended for adults age 50 years or older
  - HZ/su is recommended for adults who previously received ZVL
  - HZ/su is preferred over ZVL
- Measles, mumps, and rubella vaccination (Oct 2017)
  - Persons previously vaccinated with two doses of a mumps-containing vaccine who are identified by public health as at increased risk for mumps because of an outbreak should receive a third dose of a mumps-containing vaccine to improve protection against mumps disease and related complications

Updates – 2018 Adult Immunization Schedule Format

- Cover page – Includes additional information on special populations (pregnancy, asplenia, immunocompromising conditions), updated abbreviations for vaccines in schedule
- Figures 1 and 2 – Row added for ZVS, minor changes in text for Tdap, MMR, HPV
- Footnotes – Incorporates changes in zoster and MMR recommendations, outline format, harmonization with child and adolescent immunization schedule
- Table – No change

Recommended Immunization Schedule for Adults Age 19 Years or Older, United States, 2018

In February 2018, the *Recommended Immunization Schedule for Adults Age 19 Years or Older, United States, 2018* became effective, as recommended by the Advisory Committee on Immunization Practices (ACIP) and approved by the Centers for Disease Control and Prevention (CDC). The 2018 adult immunization schedule was also reviewed and approved by the American College of Physicians, the American Academy of Family Physicians, the American College of Obstetricians and Gynecologists, and the American College of Nurse-Midwives.

CDC announced the availability of the 2018 adult immunization schedule in the *Morbidity and Mortality Weekly Report (MMWR)*.[1] The schedule is published in its entirety in the *Annals of Internal Medicine*.[2]

The 2018 adult immunization schedule consists of figures that summarize routinely recommended vaccines for adults by age groups and medical conditions and other indications, footnotes for the figures, and a table of vaccine contraindications and precautions. Consider the following information when reviewing the adult immunization schedule:

- The figures in the adult immunization schedule should be reviewed with the accompanying footnotes.
- The figures and footnotes display indications for which vaccines, if not previously administered, should be administered unless noted otherwise.
- The table of contraindications and precautions identify populations and situations for which vaccines should not be used or should be used with caution.
- When indicated, administer recommended vaccines to adults whose vaccination history is incomplete or unknown.
- Increased interval between doses of a multi-dose vaccine series does not diminish vaccine effectiveness; it is not necessary to restart the vaccine series or add doses to the series because of an extended interval between doses.
- Combination vaccines may be used when any component of the combination is indicated and when the other components of the combination are not contraindicated.
- The use of trade names in the adult immunization schedule is for identification purposes only and does not imply endorsement by the ACIP or CDC.

The 2018 adult immunization schedule footnotes that accompany the figures identify special populations for whom additional considerations have been described, including:

- Pregnant women. Pregnant women should receive the tetanus, diphtheria, and pertussis vaccine during pregnancy and the influenza vaccine during or before pregnancy. Live vaccines (e.g., measles, mumps, and rubella vaccine) are contraindicated.
- Asplenia. Adults with asplenia have specific vaccination recommendations because of their increased risk for infection by encapsulated bacteria. Anatomical or functional asplenia includes congenital or acquired asplenia, splenic dysfunction, sickle cell disease and other hemoglobinopathies, and splenectomy.
- Immunocompromising conditions. Adults with immunosuppression should generally avoid live vaccines. Inactivated vaccines (e.g., pneumococcal vaccines) are generally acceptable. High-level immunosuppression includes HIV infection with a CD4+ T-lymphocyte count <200 cells/μL, receipt of daily corticosteroid therapy with ≥20 mg of prednisone or equivalent for ≥14 days, primary immunodeficiency disorder (e.g., severe combined immunodeficiency or complement component deficiency), hematological or solid tumor or transplantations, and receipt of cancer chemotherapy. Other immunocompromising conditions and immunosuppressive medications to consider when vaccinating adults can be found in *IDSA Clinical Practice Guideline for Vaccination of the Immunocompromised Host*.[3] Additional information on vaccinating immunocompromised adults are in *General Best Practice Guidelines for Immunization*.[4]

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Report suspected cases of reportable vaccine-preventable diseases to the local or state health department, and report all clinically significant post-vaccination events to the Vaccine Adverse Event Reporting System at www.vaers.hhs.gov or by telephone, 800-822-7967. All vaccines included in the 2018 adult immunization schedule except 23-valent pneumococcal polysaccharide and zoster vaccines are covered by the Vaccine Injury Compensation Program. Information on how to file a vaccine injury claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382.

Submit questions and comments to CDC through www.cdc.gov/cdc-info or by telephone, 800-CDC-INFO (800-232-4636), in English and Spanish, 8:00am–8:00pm ET, Monday–Friday, excluding holidays.

The following abbreviations, in the order of their appearance in the 2018 adult immunization schedule, are used for vaccines recommended for adults:

IIV	inactivated influenza vaccine
RIV	recombinant influenza vaccine
Tdap	tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
Td	tetanus and diphtheria toxoids
MMR	measles, mumps, and rubella vaccine
VAR	varicella vaccine
ZVL	zoster vaccine live
HPV vaccine	human papillomavirus vaccine
PCV13	13-valent pneumococcal conjugate vaccine
PPSV23	23-valent pneumococcal polysaccharide vaccine
HepA	hepatitis A vaccine
HepA-HepB	hepatitis A vaccine and hepatitis B vaccine
HepB	hepatitis B vaccine
MenACWY	serogroups A, C, W, and Y meningococcal vaccine
MenB	serogroup B meningococcal vaccine
Hib	*Haemophilus influenzae* type b vaccine

1. MMWR Morb Mortal Wkly Rep. 2018;66(5):xx–xx. Available at www.cdc.gov/mmwr/volumes/67/xxxxxxxxx.
2. Ann Intern Med. 2018;167:xxx-xxx. Available at annals.org/aim/article/doi/xxxxxxxxx.
3. Rubin et al. CID 2014;58(3):e44–100. Available at www.idsociety.org/Templates/Content.aspx?id=32212256011.
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nd recommendations at www.cdc.gov/travel/

service providers to download at www.cdc.gov/

vaccination needs based on age, health conditions,
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Figure 1. Recommended immunization schedule for adults age 19 years or older by age group, United States, 2018.

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Vaccine	19–21 years	22–26 years	27–49 years	50–64 years	≥65 years
Influenza[1]	1 dose annually				
Tdap/Td[2]	1 dose Tdap, then Td booster every 10 yrs				
MMR[3]	1 or 2 doses depending on indication (if born in 1957 or later)				
VAR[4]	2 doses				
ZVL[5]					1 dose
pending					
HPV–Female[6]	2 or 3 doses depending on age at series initiation				
HPV–Male[6]	2 or 3 doses depending on age at series initiation				
PCV13[7]	1 dose				
PPSV23[7]	1 or 2 doses depending on indication				1 dose
HepA[8]	2 or 3 doses depending on vaccine				
HepB[9]	3 doses				
MenACWY[10]	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
MenB[10]	2 or 3 doses depending on vaccine				
Hib[11]	1 or 3 doses depending on indication				

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with other indications

No recommendation

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ZVL[5]					1 dose
HZ/su or ZVL				2 doses HZ/su (or 1 dose ZVL if age ≥60 yrs)	
HPV–Female[6]	2 or 3 doses depending on age at series initiation				
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PCV13[7]	1 dose				
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MenACWY[10]	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
MenB[10]	2 or 3 doses depending on vaccine				
Hib[11]	1 or 3 doses depending on indication				

HZ/su or ZVL

2 doses HZ/su (or 1 dose ZVL if age ≥60 yrs)

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MenACWY[10]	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
MenB[10]	2 or 3 doses depending on vaccine				
Hib[11]	1 or 3 doses depending on indication				

3 doses →
2 or 3 doses depending on age at series initiation

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with other indications

No recommendation

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MenACWY[10]	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
MenB[10]	2 or 3 doses depending on vaccine				
Hib[11]	1 or 3 doses depending on indication				

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with other indications

No recommendation

Removed MPSV4

1 or more doses depending on indication →
1 or 2 doses depending on indication, then booster every 5 yrs if risk remains

Figure 1. Recommended immunization schedule for adults age 19 years or older by age group, United States, 2018.

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otherwise.

Td/Tdap → Tdap or Td

Substitute Tdap for Td once, then Td booster every 10 yrs →
1 dose Tdap, then Td booster every 10 yrs

Vaccine	19–21 years	22–26 years			
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MenB[10]	2 or 3 doses depending on vaccine				
Hib[11]	1 or 3 doses depending on indication				

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with other indications

No recommendation

Figure 2. Recommended immunization schedule for adults age 19 years or older by medical condition and other indications, United States, 2018

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Vaccine	Pregnancy[1-6,9]	Immuno-compromised (excluding HIV infection)[2-7,11]	HIV infection CD4+ count (cells/μL)[2-7,9-11]		Asplenia, complement deficiencies[7,10,11]	End-stage renal disease, on hemodialysis[7,9]	Heart or lung disease, alcoholism[7]	Chronic liver disease[7,9]	Diabetes[7,9]	Health care personnel[2,4,9]	Men who have sex with men[6,8,9]
			< 200	≥ 200							
Influenza[1]	1 dose annually										
Tdap/Td[2]	1 dose Tdap each pregnancy	1 dose Tdap, then Td booster every 10 yrs									
MMR[2]	contraindicated	1 or 2 doses depending on indication									
VAR[4]	contraindicated	2 doses									
ZVL[5]	contraindicated				1 dose						
Pending											
HPV–Female[6]		2 or 3 doses through age 26 yrs									
HPV–Male[6]		2 or 3 doses through age 26 yrs			2 or 3 doses through age 21 yrs						2 or 3 doses through age 26 yrs
PCV13[7]		1 dose									
PPSV23[7]		1, 2, or 3 doses depending on indication									
HepA[8]	2 or 3 doses depending on vaccine										
HepB[9]	3 doses										
MenACWY[10]	1 or 2 doses depending on indication , then booster every 5 yrs if risk remains										
MenB[10]	2 or 3 doses depending on vaccine										
Hib[11]	3 doses HSCT recipients only				1 dose						

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with other indications

Contraindicated

No recommendation

Figure 2. Recommended immunization schedule for adults age 19 years or older by medical condition and other indications, United States, 2018

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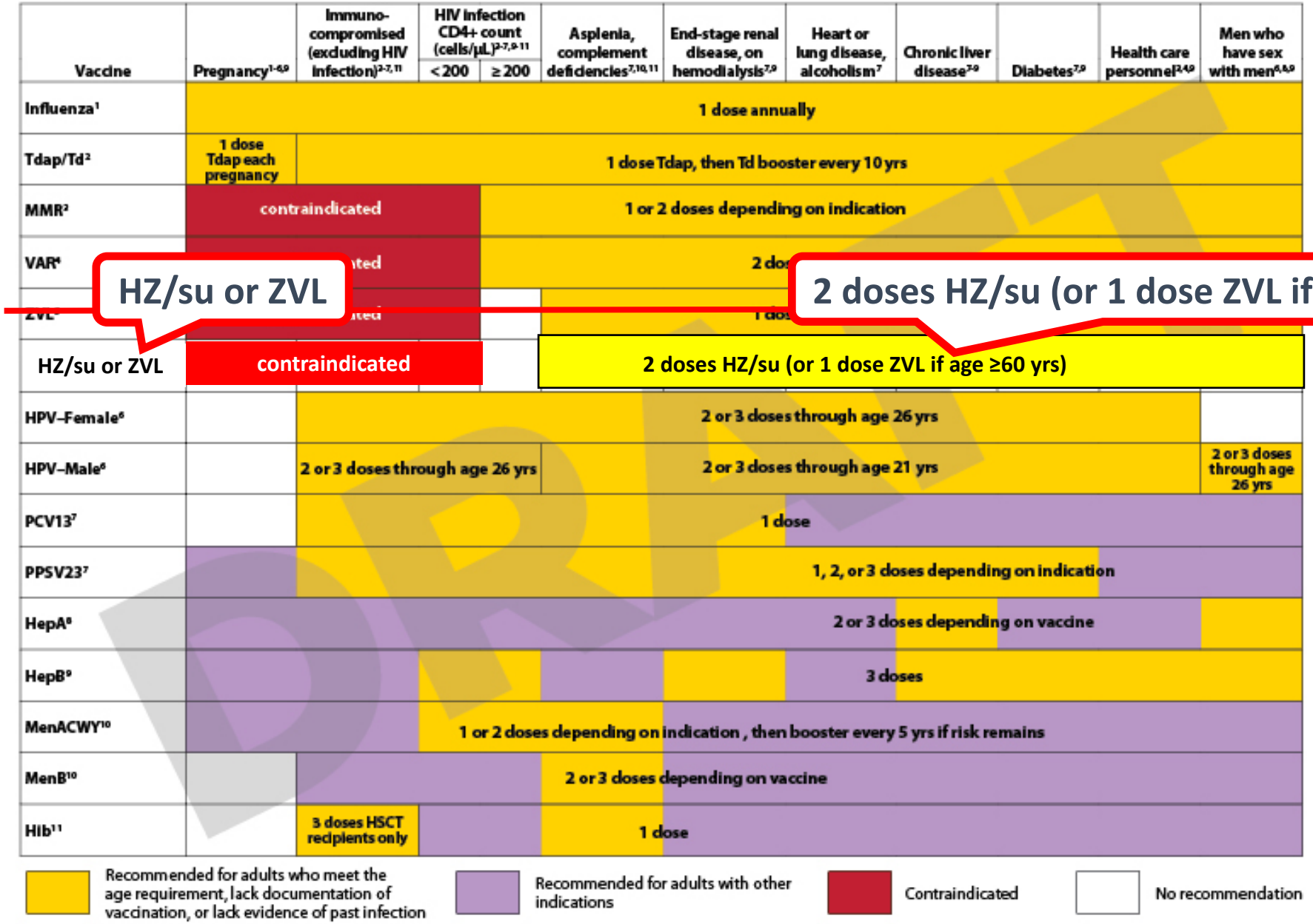

Footnotes. Recommended immunization schedule for adults age 19 years or older, United States, 2018

1. Influenza vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html

General Information

- Administer 1 dose of age-appropriate inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV) annually
- Available options for adults include:
  - High-dose or adjuvanted IIV for adults age 65 years or older
  - Intradermal IIV for adults age 18 through 64 years
- Live attenuated influenza vaccine (LAIV) is not recommended for the 2017–2018 influenza season
- A list of currently available influenza vaccines is available at www.cdc.gov/flu/protect/vaccine/vaccines.htm

Special populations

- Administer age-appropriate IIV or RIV to:
  - **Pregnant women**
  - Adults with **hives-only egg allergy**
  - Adults with **egg allergy other than hives** (e.g., angioedema or respiratory distress): Administer IIV or RIV in a medical setting under supervision of a health care provider who can recognize and manage severe allergic conditions

2. Tetanus, diphtheria, and pertussis vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/tdap-td.html

General Information

- Administer to adults with **no previous dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) as an adult or child** 1 dose of Tdap, followed by a dose of tetanus and diphtheria toxoids (Td) booster every 10 years
- Information on the use of Tdap or Td as tetanus prophylaxis in wound management is available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm

Special populations

- **Pregnant women**: Administer 1 dose of Tdap during each pregnancy, preferably in the early part of gestational weeks 27–36

3. Measles, mumps, and rubella vaccination (revision pending ACIP recommendation)

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mmr.html

General Information

- Administer to adults **without evidence of immunity to measles, mumps, or rubella** 1 dose of measles, mumps, and rubella vaccine (MMR)
- Evidence of immunity is:
  - Born before 1957 (except for health care personnel, see below)
  - Documentation of receipt of MMR
  - Laboratory evidence of immunity or disease
- Documentation of a health care provider-diagnosed disease without laboratory confirmation is not considered evidence of immunity

Special populations

- Administer 1 dose of MMR to:
  - **Pregnant women without evidence of immunity to rubella**: Administer after pregnancy and before discharge from health care facility
  - **Non-pregnant women of childbearing age without evidence of immunity to rubella**
- Administer 2 doses of MMR at least 28 days apart to adults with **HIV infection and CD4 cell count ≥200 cells/µL for at least 6 months**
- Administer 2 doses of MMR at least 28 days apart if no evidence of immunity or 1 dose of MMR if received 1 dose previously to:
  - **Students in postsecondary educational institutions**
  - **International travelers**
  - **Health care personnel born in 1957 or later** (if born before 1957, consider MMR vaccination)
  - **Household contacts of immunocompromised persons**
  - MMR is contraindicated for pregnant women and adults with severe immunodeficiency

4. Varicella vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/varicella.html

General Information

- Administer to adults **without evidence of immunity to varicella** 2 doses of varicella vaccine (VAR) 4–8 weeks apart if previously received no varicella-containing vaccine, or 1 dose of VAR if previously received 1 dose of varicella-containing vaccine (at least 4 weeks after the first dose)
- Evidence of immunity to varicella is:
  - U.S.-born before 1980 (except for pregnant women and health care personnel, see below)
  - Documentation of receipt of 2 doses of varicella or varicella-containing vaccine at least 4 weeks apart
  - Diagnosis or verification of history of varicella or herpes zoster by a health care provider
  - Laboratory evidence of immunity or disease

Special populations

- Administer 2 doses series of VAR 4–8 weeks apart if previously received no varicella-containing vaccine, or 1 dose of VAR if previously received 1 dose of varicella-containing vaccine (at least 4 weeks after the first dose) to:
  - **Pregnant women without evidence of immunity**: Administer the first of the 2 doses or the second dose after pregnancy and before discharge from health care facility
  - **Health care personnel without evidence of immunity**
- Adults with **HIV infection and CD4 cell count ≥200 cells/µL**: May administer, based on individual clinical decision, 2 doses of VAR 3 months apart
- VAR is contraindicated for pregnant women and adults with severe immunodeficiency

5. Zoster vaccination (revision pending ACIP recommendation)

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/shingles.html

General Information

- Adults age 60 years or older should receive 1 dose of zoster vaccine live (ZVL), regardless of whether they had a prior episode of herpes zoster.

Special populations

- Adults age 60 years or older with chronic medical conditions may receive ZVL unless they have a medical contraindication, e.g., pregnancy or severe immunodeficiency
- Adults with malignant conditions, including those that affect the bone marrow or lymphatic system or who receive systemic immunosuppressive therapy, should not receive ZVL

6. Human papillomavirus vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hpv.html

General Information

- Administer human papillomavirus (HPV) vaccine to **females through age 26 years** and **males through age 21 years** (males age 22 through 26 years may be vaccinated based on individual clinical decision)
- The number of doses of HPV to be administered depends on age at initial HPV vaccination
  - **No previous dose** of HPV vaccine: Administer 3-dose series at 0, 1–2, and 6 months (minimum intervals: 4 weeks between first and second doses, 12 weeks between second and third doses, and 5 months between first and third doses (repeat doses if given too soon)
  - **Age 9–14 years at vaccine series initiation and received 1 dose or 2 doses less than 5 months apart**: Administer 1 dose
  - **Age 9–14 years at vaccine series initiation and received 2 doses at least 5 months apart**: No additional dose is needed

Special populations

- Adults with **immunocompromising conditions (including HIV)** through age 26 years: Administer 3-dose series at 0, 1–2, and 6 months
- **Men who have sex with men** through age 26 years: Administer 2- or 3-dose series depending on age at initial vaccination (see above); if no history of HPV vaccine, administer 3-dose series at 0, 1–2, and 6 months
- **Pregnant women** through age 26 years: HPV vaccination is not recommended during pregnancy, but there is no evidence that the vaccine is harmful and no intervention needed for women who inadvertently receive HPV vaccine while pregnant; delay remaining doses until after pregnancy; pregnancy testing is not needed before vaccination

7. Pneumococcal vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/pneumo.html

General Information

- Administer to immunocompetent adults **age 65 years or older** 1 dose of 13-valent pneumococcal conjugate vaccine (PCV13) followed by 1 dose of 23-valent pneumococcal polysaccharide vaccine (PPSV23) at least 1 year after PCV13
- When both PCV13 and PPSV23 are indicated, administer PCV13 first (PCV13 and PPSV23 should not be administered during the same visit); additional information on vaccine timing is available at www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf

Special populations

- Administer to adults age 19 through 64 years with the following chronic conditions 1 dose of PPSV23 (at age 65 years or older, administer 1 dose of PCV13, if not previously received, and another dose of PPSV23 at least 1 year after PCV13 and at least 5 years after PPSV23):
  - **Chronic heart disease** (excluding hypertension)
  - **Chronic lung disease**
  - **Chronic liver disease**
  - **Alcoholism**
  - **Diabetes mellitus**
  - **Cigarette smoking**
- Administer to adults age 19 years or older with the following indications 1 dose of PCV13 followed by 1 dose of PPSV23 at least 8 weeks after PCV13, and a second dose of PPSV23 at least 5 years after the first dose of PPSV23 (administer a second dose of PPSV23 at least 5 years after the first dose of PPSV23; if the most recent dose of PPSV23 was administered before age 65 years, at age 65 years or older, administer another dose of PPSV23 at least 5 years after the last dose of PPSV23):
  - **Immunodeficiency disorders** including B- and T-lymphocyte deficiency, complement deficiencies, and phagocytic disorders
  - **HIV infection**
  - **Anatomical or functional asplenia**
  - **chronic renal failure and nephrotic syndrome**
- Administer to adults age 19 years or older with the following indication 1 dose of PCV13 followed by 1 dose of PPSV23 at least 8 weeks after PCV13 (if the dose of PPSV23 was administered before age 65 years, at age 65 years or older, administer another dose of PPSV23 at least 5 years after the last dose of PPSV23):
  - **Cerebrospinal fluid leak**
  - **Cochlear implant**

8. Hepatitis A vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hepa.html

General Information

- Administer to adults who have a specific risk (see below), or lack a risk factor but want protection, 3-dose series of single antigen hepatitis A vaccine (HepA; Havrix at 0 and 6–12 months or Vaqta at 0 and 6–18 months; minimum interval: 6 months) or combined hepatitis A and hepatitis B vaccine (HepA-HepB) at 0, 1, and 6 months; minimum intervals: 4 weeks between first and second doses, 5 months between second and third doses

Special populations

- Administer HepA or HepA-HepB to adults with the following indications:
  - **Travel** to or work in countries with high or intermediate hepatitis A endemicity
  - **Men who have sex with men**
  - **Injection or non-injection drug use**
  - **Work with hepatitis A virus in a research laboratory or with non-human primates infected with hepatitis A virus**
  - **Clotting-factor disorders**
  - **Chronic liver disease**
  - Close, personal **contact with an international adoptee** (e.g., household or regular babysitting) during the first 60 days after arrival in the United States from a country with high or intermediate endemicity (administer the first dose as soon as the adoption is planned)
  - Healthy adults **up to age 40 years who have recently been exposed to hepatitis A virus**; adults older than age 40 years may receive HepA or HepA-HepB if hepatitis A immunoglobulin cannot be obtained

9. Hepatitis B vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hepb.html

General Information

- Administer to adults who have a specific risk (see below), or lack a risk factor but want protection, 3-dose series of single antigen hepatitis B vaccine (HepB) or combined hepatitis A and hepatitis B vaccine (HepA-HepB) at 0, 1, and 6 months (minimum intervals: 4 weeks between first and second doses, 5 months between second and third doses)

Special populations

- Administer HepB or HepA-HepB to adults with the following indications:
  - **Chronic liver disease** (e.g., hepatitis C infection, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice the upper limit of normal)
  - **HIV infection**
  - **Percutaneous or mucosal risk to blood** (e.g., **household contacts** of hepatitis B surface antigen [HBsAg]-positive persons; persons younger than age 60 years with **diabetes mellitus** or age 60 years or older with diabetes mellitus based on individual clinical decision; persons in predialysis care or receiving **hemodialysis or peritoneal dialysis**; recent or current **injection drug users**; **health care and public safety workers** at risk for exposure to blood or blood-contaminated body fluids)
  - **Sexual exposure risk** (e.g., sex partners of HBsAg-positive persons; sexually active persons not in a mutually monogamous relationship; persons seeking evaluation or treatment for a sexually transmitted infection; and **men who have sex with men** [MSM])
  - Receive care in **settings with a high proportion of adults have risks for hepatitis B infection** (e.g., facilities providing sexually transmitted disease treatment, drug-abuse treatment and prevention services, hemodialysis and end-stage renal disease programs, institutions for developmentally disabled persons, health care settings targeting services to injection drug users or men who have sex with men, HIV testing and treatment facilities, and correctional facilities)
  - **Travel** to countries with high or intermediate hepatitis B endemicity

10. Meningococcal vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html

Special populations: Serogroups A, C, W, and Y meningococcal vaccine (MenACWY)

- Administer 2 doses of MenACWY at least 8 weeks apart and revaccinate with 1 dose of MenACWY every 5 years, if the risk remains, to adults with the following indications:
  - **Anatomical or functional asplenia including sickle cell disease**
  - **HIV infection**
  - **Persistent complement component deficiency**
  - **Eculizumab use**
- Administer 1 dose of MenACWY and revaccinate with 1 dose of MenACWY every 5 years, if the risk remains, to adults with the following indications:
  - **Travel to or live in countries where meningococcal disease is hyperendemic or epidemic**, including countries in the African meningitis belt or during the Hajj
  - At risk from a **meningococcal disease outbreak attributed to serogroup A, C, W, or Y**
  - **Microbiologists** routinely exposed to *Neisseria meningitidis*
  - **Military recruits**
  - **First-year college students age 21 years or younger who live in residential housing** (if did not receive MenACWY at age 16 years or older)

General Information: Serogroup B meningococcal vaccine (MenB)

- May administer, based on individual clinical decision, to young adults and adolescents **age 16–23 years (preferred age is 16–18 years) who are not at increased risk** MenB (2-dose series of MenB-4C [Bexsero] at least 1 month apart or 2-dose series of MenB-FHbp [Trumenba] at least 6 months apart)
- MenB-4C and MenB-FHbp are not interchangeable

Special populations: MenB

- Administer 2-dose series of MenB-4C at least 1 month apart or 3-dose series of MenB-FHbp at 0, 1–2, and 6 months to adults with the following indications:
  - **Anatomical or functional asplenia** (including sickle cell disease)
  - **Persistent complement component deficiency**
  - **Eculizumab use**
  - At risk from a **meningococcal disease outbreak attributed to serogroup B**
  - **Microbiologists** routinely exposed to *Neisseria meningitidis*

11. *Haemophilus influenzae* type b vaccination

www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hib.html

Special populations

- Administer *Haemophilus influenzae* type b vaccine (Hib) to adults with the following indications:
  - **Anatomical or functional asplenia** (including sickle cell disease) or undergoing elective splenectomy: Administer 1 dose if not previously vaccinated (preferably at least 14 days before elective splenectomy)
  - **Hematopoietic stem cell transplant (HSCT)**: Administer 3-dose series with doses 4 weeks apart starting 6 to 12 months after successful transplant regardless of Hib vaccination history

Footnotes. Recommended immunization schedule for adults age 19 years or older, United States, 2018

1. Influenza vaccination
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html

General Information
- Administer 1 dose of age-appropriate inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV) annually
- Available options for adults include:
  - High-dose or adjuvanted IIV for adults age 65 years or older
  - Intradermal IIV for adults age 18 through 64 years
- Live attenuated influenza vaccine (LAIV) is not recommended for the 2017–2018 influenza season
- A list of currently available influenza vaccines is available at www.cdc.gov/flu/protect/vaccine/vaccines.htm

Special populations
- Administer age-appropriate IIV or RIV to:
  - **Pregnant women**
  - Adults with **hives-only egg allergy**
  - Adults with **egg allergy other than hives** (e.g., angioedema or respiratory distress): Administer IIV or RIV in a medical setting under supervision of a health care

- Administer 1 dose of MMR to:
  - **Pregnant women without evidence of immunity to rubella:** Administer after pregnancy and before discharge from health care facility
  - **Non-pregnant women of childbearing age without evidence of immunity to rubella**
- Administer 2 doses of M… with **HIV infection and … least 6 months**
- Administer 2 doses of M… evidence of immunity o… previously to:
  - **Students in postseco…**
  - **International travele…**
  - **Health care personne…** before 1957, consider
  - **Household contacts …**
  - MMR is contraindicate… with severe immunod…

4. Varicella vaccination
www.cdc.gov/vaccines/hcp/a…

- Evidence of immunity is:
  - Born before 1957 (except for health care personnel, see below)
  - Documentation of receipt of MMR
  - Laboratory evidence of immunity or disease
- Documentation of a health care provider-diagnosed disease without laboratory confirmation is not considered evidence of immunity

Special populations

- of VAR 3 months apart
- VAR is contraindicated for pregnant women and adults with severe immunodeficiency

5. Zoster vaccination (revision pending ACIP recommendation)

General Information
- Adults age 60 years or older should receive 1 dose of zoster vaccine live (ZVL), regardless of whether they had a prior episode of herpes zoster.

Special populations
- Adults age 60 years or older with chronic medical conditions may receive ZVL unless they have a medical contraindication, e.g., pregnancy or severe immunodeficiency
- Adults with malignant conditions, including those that

General Information
- Administer to immunocompetent adults **age 65 years or older** 1 dose of 13-valent pneumococcal conjugate vaccine (PCV13) followed by 1 dose of 23-valent pneumococcal polysaccharide vaccine (PPSV23) at least 1 year after PCV13
- When both PCV13 and PPSV23 are indicated, administer PCV13 first (PCV13 and PPSV23 should not be administered during the same visit); additional information on vaccine timing is available at www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf

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Herpes zoster vaccination

General information
- Adults aged 60 years or older should receive 1 dose of herpes zoster vaccine (HZV), regardless of whether they had a prior episode of herpes zoster.

Special populations
- Adults aged 60 years or older with chronic medical conditions may receive HZV unless they have a medical contraindication, e.g., pregnancy or severe immunodeficiency.
- Adults with malignant conditions, including those that affect the bone marrow or lymphatic system or who receive systemic immunosuppressive therapy, should not receive HZV.
- Adults with human immunodeficiency virus (HIV) infection and CD4+ T-lymphocyte count <200 cells/µl should not receive HZV.

Zoster vaccination
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/shingles.html

General information
- Administer 2 doses of herpes zoster subunit vaccine (HZ/su) 8 weeks apart to adults age 50 years or older regardless of past episode of herpes zoster or past history of zoster vaccine live (ZVL)
- Adults age 50 years or older who previously received ZVL should receive 2 doses of HZ/su 8 weeks apart at least 8 weeks after ZVL
- ZVL continues to be an option for adults age 60 years or older; however, HZ/su is preferred in this age group

Special populations
- **Pregnant women** and adults with **immunocompromising conditions**, including those with **HIV and CD4 cell count <200 cells/µL**, should not receive HZ/su or ZVL

Persons previously vaccinated with two doses of a mumps-containing vaccine who are identified by public health as at increased risk for mumps because of an outbreak should receive a third dose of a mumps-containing vaccine to improve protection against mumps disease and related complications.

Administer 1 dose of MMR to adults who previously received 2 doses of measles-containing vaccine who are identified by public health as at increased risk for mumps in an outbreak

Measles, mumps, and rubella vaccination
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mmr.html

General information
- Administer to adults **without evidence of immunity to measles, mumps, or rubella** 1 dose of measles, mumps, and rubella vaccine (MMR)
- Evidence of immunity is:
  - Born before 1957 (except for health care personnel, see below)
  - Documentation of receipt of MMR
  - Laboratory evidence of immunity or disease
  - Documentation of a health care provider-diagnosed disease without laboratory confirmation is not considered evidence of immunity

Special populations
- Administer 1 dose of MMR to:
  - **Pregnant women without evidence of immunity** to rubella: Administer after pregnancy and before discharge from health care facility
  - **Non-pregnant women of childbearing age without evidence of immunity to rubella**
- Administer 2 doses of MMR at least 28 days apart to adults with **HIV infection and CD4 cell count ≥200 cells/µL** for at least 6 months
- Administer 2 doses of MMR at least 28 days apart if no evidence of immunity or 1 dose of MMR if received 1 dose previously to:
  - **Students in postsecondary educational institutions**
  - **International travelers**
  - **Health care personnel born in 1957 or later** (if born before 1957, consider MMR vaccination)
  - **Household contacts of immunocompromised persons**
- Administer 1 dose of MMR to adults who **previously received 2 doses of measles-containing vaccine who are identified by public health as at increased risk for mumps in an outbreak**
- MMR is contraindicated for pregnant women and adults with severe immunodeficiency

Footnotes. Recommended immunization schedule for adults age 19 years or older, United States, 2018

1. **Influenza vaccination**
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html
General Information
- Administer 1 dose of age-appropriate inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV) annually
- Available options for adults include:
  - High-dose or adjuvanted IIV for adults age 65 years or older
  - Intradermal IIV for adults age 18 through 64 years

3. **Measles, mumps, and rubella vaccination (revision pending ACIP recommendation)**
General Information
- Administer to adults **without evidence of immunity to measles, mumps, or rubella** 1 dose of measles, mumps, and rubella vaccine (MMR)
- Evidence of immunity is:
  - Born before 1957 (except for health care personnel, see below)
  - Documentation of receipt of MMR
  - Laboratory evidence of immunity or disease
- Documentation of a health care provider-diagnosed disease without laboratory confirmation is not considered evidence of immunity

Special populations

5. **recommendation)**
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/shingles.html
General Information
- Adults age 60 years or older should receive 1 dose of zoster vaccine live (ZVL), regardless of whether they had a prior episode of herpes zoster.

Footnotes. Recommended immunization schedule for adults age 19 years or older, United States, 2018

1. **Influenza vaccination**
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html

General Information

- Administer 1 dose of age-appropriate inactivated influenza

- Administer 1 dose of MMR to:
  - **Pregnant women without evidence of immunity to rubella**: Administer after pregnancy and before discharge from health care facility
  - **Non-pregnant women of childbearing age without immunity to rubella**

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ion and CD4 cell count ≥200 cells/μL for at

ses of MMR at least 28 days apart if no
nunity or 1 dose of MMR if received 1 dose

episode of herpes zoster.

Special populations

- Adults age 60 years or older with chronic medical conditions may receive ZVL unless they have a medical contraindication, e.g., pregnancy or severe immunodeficiency
- Adults with malignant conditions, including those that affect the bone marrow or lymphatic system or who receive systemic immunosuppressive therapy, should not receive ZVL

6. Human papillomavirus vaccination

of immunity

Special populations

General information

- Adults age 60 years or older should receive 1 dose of zoster vaccine live (ZVL), regardless of whether they had a prior

timing is available at www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf

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Human papillomavirus vaccination

General information

- Adult females through age 26 years and adult males through age 21 years who have not received any human papillomavirus (HPV) vaccine should receive a 3-dose series of HPV vaccine at 0, 1-2, and 6 months. Males aged 22 through 26 years may be vaccinated with a 3-dose series of HPV vaccine at 0, 1–2, and 6 months.
- Adult females through age 26 years and adult males through age 21 years (and males aged 22 through 26 years who may receive HPV vaccination) who initiated the HPV vaccination series before age 15 years and received 2 doses at least 5 months apart are considered adequately vaccinated and do not need an additional dose of HPV vaccine.
- Adult females through age 26 years and adult males through age 21 years (and males aged 22 through 26 years who may receive HPV vaccination) who initiated the HPV vaccination series before age 15 years and received only 1 dose, or 2 doses less than 5 months apart, are not considered adequately vaccinated and should receive 1 additional dose of HPV vaccine.
- Notes: HPV vaccination is routinely recommended for children at age 11 or 12 years. For adults who had initiated but did not complete the HPV vaccination series, consider their age at first HPV vaccination (described above) and other facto (described below) to determine if they have been adequately vaccinated.

Special populations

- Men who have sex with men through age 26 years who have not received any HPV vaccine should receive a 3-dose series of HPV vaccine at 0, 1-2, and 6 months.
- Adult females and males through age 26 years with immunocompromising conditions (described below), including those with human immunodeficiency virus (HIV) infection, should receive a 3-dose series of HPV vaccine at 0, 1–2, and 6 months.
- Pregnant women are not recommended to receive HPV vaccine, although there is no evidence that the vaccine poses harm. If a woman is found to be pregnant after initiating the HPV vaccination series, delay the remaining doses until after the pregnancy. No other intervention is needed. Pregnancy testing is not needed before administering HPV vaccine.
- Notes: Immunocompromising conditions for which a 3-dose series of HPV vaccine is indicated are primary or secondary immunocompromising conditions that might reduce cell-mediated or humoral immunity, e.g., B-lymphocyte antibody deficiencies, complete or partial T-lymphocyte defects, HIV infection, malignant neoplasm, transplantation, autoimmune disease, and immunosuppressive therapy.

Human papillomavirus vaccination
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/hpv.html

General information

- Administer human papillomavirus (HPV) vaccine to f**emales through age 26 years** and **males through age 21 years** (males age 22 through 26 years may be vaccinated based on individual clinical decision)
- The number of doses of HPV to be administered depends on age at initial HPV vaccination
  - **No previous dose** of HPV vaccine: Administer 3-dose series at 0, 1–2, and 6 months (minimum intervals: 4 weeks between first and second doses, 12 weeks between second and third doses, and 5 months between first and third doses (repeat doses if given too soon)
  - **Age 9–14 years at vaccine series initiation and received 1 dose or 2 doses less than 5 months apart**: Administer 1 dose
  - **Age 9–14 years at vaccine series initiation and received 2 doses at least 5 months apart**: No additional dose is needed

Special populations

- Adults with **immunocompromising conditions (including HIV)** through age 26 years: Administer 3-dose series at 0, 1–2, and 6 months
- **Men who have sex with men** through age 26 years: Administer 2- or 3-dose series depending on age at initial vaccination (see above); if no history of HPV vaccine, administer 3-dose series at 0, 1–2, and 6 months
- **Pregnant women** through age 26 years: HPV vaccination is not recommended during pregnancy, but there is no evidence that the vaccine is harmful and no intervention needed for women who inadvertently receive HPV vaccine while pregnant; delay remaining doses until after pregnancy; pregnancy testing is not needed before vaccination

Meningococcal vaccination

Special populations

- Adults with anatomical or functional asplenia or persistent complement component deficiencies should receive a 2-dose primary series of serogroups A, C, W, and Y meningococcal conjugate vaccine (MenACWY) at least 2 months apart and revaccinate every 5 years. They should also receive a series of serogroup B meningococcal vaccine (MenB) with either a 2-dose series of MenB-4C (Bexsero) at least 1 month apart or a 3-dose series of MenB-FHbp (Trumenba) at 0, 1–2, and 6 months.
- Adults with human immunodeficiency virus (HIV) infection who have not been previously vaccinated should receive a 2-dose primary series of MenACWY at least 2 months apart and revaccinate every 5 years. Those who previously received 1 dose of MenACWY should receive a second dose at least 2 months after the first dose. Adults with HIV infection are not routinely recommended to receive MenB because meningococcal disease in this population is caused primarily by serogroups C, W, and Y.
- Microbiologists who are routinely exposed to isolates of Neisseria meningitidis should receive 1 dose of MenACWY and revaccinate every 5 years if the risk for infection remains, and either a 2-dose series of MenB-4C at least 1 month apa 3-dose series of MenB-FHbp at 0, 1–2, and 6 months.
- Adults at risk because of a meningococcal disease outbreak should receive 1 dose of MenACWY if the outbreak is attributable to serogroup A, C, W, or Y, or either a 2-dose series of MenB-4C at least 1 month apart or a 3-dose series of MenB-FHbp at 0, 1–2, and 6 months if the outbreak is attributable to serogroup B.
- Adults who travel to or live in countries with hyperendemic or epidemic meningococcal disease should receive 1 dose of MenACWY and revaccinate every 5 years if the risk for infection remains. MenB is not routinely indicated because meningococcal disease in these countries is generally not caused by serogroup B.
- Military recruits should receive 1 dose of MenACWY and revaccinate every 5 years if the increased risk for infection remains.
- First-year college students aged 21 years or younger who live in residence halls should receive 1 dose of MenACWY if they have not received MenACWY at age 16 years or older.
- Young adults aged 16 through 23 years (preferred age range is 16 through 18 years) who are healthy and not at increased risk for serogroup B meningococcal disease (described above) may receive either a 2-dose series of MenB-4C at least 1 month apart or a 2-dose series of MenBFHbp at 0 and 6 months for short-term protection against most strains of serogroup B meningococcal disease.
- For adults aged 56 years or older who have not previously received serogroups A, C, W, and Y meningococcal vaccine and need only 1 dose, meningococcal polysaccharide serogroups A, C, W, and Y vaccine (MPSV4) is preferred. For adults who previously received MenACWY or anticipate receiving multiple doses of serogroups A, C, W, and Y meningococcal vaccine, MenACWY is preferred.
- Notes: MenB-4C and MenB-FHbp are not interchangeable, i.e., the same vaccine should be used for all doses to complete the series. There is no recommendation for MenB revaccination at this time. MenB may be administered at the same time as MenACWY but at a different anatomic site, if feasible.

Meningococcal vaccination
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html

Special populations: Serogroups A, C, W, and Y meningococcal vaccine (MenACWY)

- Administer 2 doses of MenACWY at least 8 weeks apart and revaccinate with 1 dose of MenACWY every 5 years, if the risk remains, to adults with the following indications:
  - **Anatomical or functional asplenia including sickle cell disease**
  - **HIV infection**
  - **Persistent complement component deficiency**
  - **Eculizumab use**
- Administer 1 dose of MenACWY and revaccinate with 1 dose of MenACWY every 5 years, if the risk remains, to adults with the following indications:
  - **Travel to or live in countries where meningococcal disease is hyperendemic or epidemic**, including countries in the African meningitis belt or during the Hajj
  - At risk from a **meningococcal disease outbreak attributed to serogroup A, C, W, or Y**
  - **Microbiologists** routinely exposed to *Neisseria meningitidis*
  - **Military recruits**
  - **First-year college students age 21 years or younger who live in residential housing** (if did not receive MenACWY at age 16 years or older)

General Information: Serogroup B meningococcal vaccine (MenB)

- May administer, based on individual clinical decision, to young adults and adolescents **age 16–23 years (preferred age is 16–18 years) who are not at increased risk** MenB (2-dose series of MenB-4C [Bexsero] at least 1 month apart or 2-dose series of MenB-FHbp [Trumenba] at least 6 months apart)
- MenB-4C and MenB-FHbp are not interchangeable

Special populations: MenB

- Administer 2-dose series of MenB-4C at least 1 month apart or 3-dose series of MenB-FHbp at 0, 1–2, and 6 months to adults with the following indications:
  - **Anatomical or functional asplenia** (including sickle cell disease)
  - **Persistent complement component deficiency**
  - **Eculizumab use**
  - At risk from a **meningococcal disease outbreak attributed to serogroup B**
  - **Microbiologists** routinely exposed to *Neisseria meningitidis*

Table. Contraindications and precautions for vaccines recommended for adults age 19 years or older*

The Advisory Committee on Immunization Practices (ACIP) recommendations and package inserts for vaccines provide information on contraindications and precautions related to vaccines. Contraindications are conditions that increase chances of a serious adverse reaction in vaccine recipients and the vaccine should not be administered when a contraindication is present. Precautions should be reviewed for potential risks and benefits for vaccine recipient.

Contraindications and precautions for vaccines routinely recommended for adults

Vaccine	Contraindications	Precautions
All vaccines routinely recommended for adults	• Severe reaction, e.g., anaphylaxis, after a previous dose or to a vaccine component	• Moderate or severe acute illness with or without fever

Additional contraindications and precautions for vaccines routinely recommended for adults

Vaccine	Additional Contraindications	Additional Precautions
IIV[1]		• History of Guillain-Barré Syndrome within 6 weeks after previous influenza vaccination • Egg allergy other than hives, e.g., angioedema, respiratory distress, lightheadedness, or recurrent emesis; or required epinephrine or another emergency medical intervention (IIV may be administered in an inpatient or outpatient medical setting and under the supervision of a healthcare provider who is able to recognize and manage severe allergic conditions)
RIV[1]		• History of Guillain-Barré Syndrome within 6 weeks after previous influenza vaccination
Tdap/Td	• For pertussis-containing vaccines: encephalopathy, e.g., coma, decreased level of consciousness, or prolonged seizures, not attributable to another identifiable cause within 7 days of administration of a previous dose of a vaccine containing tetanus or diphtheria toxoid or acellular pertussis	• Guillain-Barré Syndrome within 6 weeks after a previous dose of tetanus toxoid-containing vaccine • History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccine. Defer[illegible]ation until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine • For pertu[illegible]rogressive or unstable neurologic disorder, uncontrolled seizures, c[illegible]til a treatment regimen has been established and the condition has
MMR[2]	• Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy[3], human immunodef[illegible] infection with severe immunocompromise • Pregnancy	[illegible]receipt of antibody-containing blood product (specific interval depends on [illegible] thrombocytopenia or thrombocytopenic purpura [illegible]ed for tuberculin skin testing[5]
VAR[2]	• Severe immunodeficiency, e.g., hematologic and solid t[illegible] immunodeficiency or long-term immunosuppressive [illegible] immunocompromise • Pregnancy	• Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)[4] • Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacydovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)
ZVL[2]	• Severe immunodeficiency, e.g., hematologic and solid t[illegible]emotherapy, congenital immunodeficiency or long-term immunosuppressive therapy[3], HIV infection with severe immunocompromise • Pregnancy	• Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacydovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)
HPV vaccine		• Pregnancy
PCV13	• Severe allergic reaction to any vaccine containing diphtheria toxoid	

1. For additional information on use of influenza vaccines among persons with egg allergy, see: CDC. Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices—United States, 2016–17 influenza season. MMWR 2016;65(RR-5):1–54. Available at www.cdc.gov/mmwr/volumes/65/rr/rr6505a1.htm.
2. MMR may be administered together with VAR or ZVL on the same day. If not administered on the same day, separate live vaccines by at least 28 days.
3. Immunosuppressive steroid dose is considered to be daily receipt of 20 mg or more prednisone or equivalent for two or more weeks. Vaccination should be deferred for at least 1 month after discontinuation of immunosuppressive steroid therapy. Providers should consult ACIP recommendations for complete information on the use of specific live vaccines among persons on immune-suppressing medications or with immune suppression because of other reasons.
4. Vaccine should be deferred for the appropriate interval if replacement immune globulin products are being administered. See: Best practice guidance of the Advisory Committee on Immunization Practices (ACIP). Available at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html.
5. Measles vaccination may temporarily suppress tuberculin reactivity. Measles-containing vaccine may be administered on the same day as tuberculin skin testing, or should be postponed for at least 4 weeks after vaccination.

* Adapted from: CDC. Table 6. Contraindications and precautions to commonly used vaccines. General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices. MMWR 2011;60(No. RR-2):40–41 and from: Hamborsky J, Kroger A, Wolfe S, eds. Appendix A. Epidemiology and prevention of vaccine preventable diseases. 13th ed. Washington, DC: Public Health Foundation, 2015. Available at www.cdc.gov/vaccines/pubs/pinkbook/index.html.

Abbreviations of vaccines

IIV	inactivated influenza vaccine	VAR	varicella vaccine	HepA-HepB	hepatitis A and hepatitis B vaccines
RIV	recombinant influenza vaccine	ZVL	zoster vaccine live	HepB	hepatitis B vaccine
Tdap	tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine	HPV vaccine	human papillomavirus vaccine	MenACWY	serogroups A, C, W, and Y meningococcal vaccine
		PCV13	13-valent pneumococcal conjugate vaccine	MenB	serogroup B meningococcal vaccine
Td	tetanus and diphtheria toxoids	PPSV23	23-valent pneumococcal polysaccharide vaccine	Hib	*Haemophilus influenzae* type b vaccine
MMR	measles, mumps, and rubella vaccine	HepA	hepatitis A vaccine		

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Next Steps

- Revise based on ACIP comments and suggestions
- If voted to move forward, submit for approval by CDC Director
- Obtain approval from partner professional organizations
  - American College of Physicians
  - American Academy of Family Physicians
  - American College of Obstetricians and Gynecologists
  - American College of Nurse-Midwives
- Submit for CDC clearance for *MMWR* announcement and publication in *Annals of Internal Medicine* in February 2018
- Coordinate announcement and promotion by other partner organizations

Discussion and Vote

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The following slides replace slides 7, 12, and 16

Replaces Slide 7

Figure 1. Recommended immunization schedule for adults age 19 years or older by age group, United States, 2018.

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.

Vaccine	19–21 years	22–26 years	27–49 years	50–64 years	≥65 years
Influenza[1]	1 dose annually				
Tdap/Td[2]	1 dose Tdap, then Td booster every 10 yrs				
MMR[3]	1 or 2 doses depending on indication (if born in 1957 or later)				
VAR[4]	2 doses				
ZVL[5]					1 dose
or					or
HZ/su (preferred)					2 doses
HPV–Female[6]	2 or 3 doses depending on age at series initiation				
HPV–Male[6]	2 or 3 doses depending on age at series initiation				
PCV13[7]	1 dose				
PPSV23[7]	1 or 2 doses depending on indication				1 dose
HepA[8]	2 or 3 doses depending on vaccine				
HepB[9]	3 doses				
MenACWY[10]	1 or 2 doses depending on indication, then booster every 5 yrs if risk remains				
MenB[10]	2 or 3 doses depending on vaccine				
Hib[11]	1 or 3 doses depending on indication				

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with other indications

No recommendation

The order of HZ/su and ZVL rows to be reversed

Replaces Slide 12

Figure 2. Recommended immunization schedule for adults age 19 years or older by medical condition and other indications, United States, 2018

This figure should be reviewed with the accompanying footnotes. This figure and the footnotes describe indications for which vaccines, if not previously administered, should be administered unless noted otherwise.

Vaccine	Pregnancy[1-6,9]	Immuno-compromised (excluding HIV infection)[2-7,11]	HIV infection CD4+ count (cells/μL)[2-7,9-11]		Asplenia, complement deficiencies[7,10,11]	End-stage renal disease, on hemodialysis[7,9]	Heart or lung disease, alcoholism[7]	Chronic liver disease[7,9]	Diabetes[7,9]	Health care personnel[2,4,9]	Men who have sex with men[6,8,9]
			<200	≥200							
Influenza[1]	1 dose annually										
Tdap/Td[2]	1 dose Tdap each pregnancy	1 dose Tdap, then Td booster every 10 yrs									
MMR[2]	contraindicated	1 or 2 doses depending on indication									
VAR[4]	contraindicated	2 doses									
ZVL[5]	contraindicated				1 dose age ≥60 yrs or 2 doses age ≥50 yrs						
HZ/su (preferred)											
HPV–Female[6]		2 or 3 doses through age 26 yrs									
HPV–Male[6]		2 or 3 doses through age 26 yrs			2 or 3 doses through age 21 yrs						2 or 3 doses through age 26 yrs
PCV13[7]		1 dose									
PPSV23[7]		1, 2, or 3 doses depending on indication									
HepA[8]		2 or 3 doses depending on vaccine									
HepB[9]		3 doses									
MenACWY[10]		1 or 2 doses depending on indication, then booster every 5 yrs if risk remains									
MenB[10]		2 or 3 doses depending on vaccine									
Hib[11]		3 doses HSCT recipients only			1 dose						

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection

Recommended for adults with other indications

Contraindicated

No recommendation

The order of HZ/su and ZVL rows to be reversed

Replaces Slide 16

Persons previously vaccinated with two doses of a mumps-containing vaccine who are identified by public health as at increased risk for mumps because of an outbreak should receive a third dose of a mumps-containing vaccine to improve protection against mumps disease and related complications.

Adults during a mumps outbreak and identified by public health to be at increased risk: If previously vaccinated with 1 or 2 doses of mumps-containing vaccine, administer 1 dose of MMR

Measles, mumps, and rubella vaccination
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mmr.html

General information
- Administer to adults **without evidence of immunity to measles, mumps, or rubella** 1 dose of measles, mumps, and rubella vaccine (MMR)
- Evidence of immunity is:
  - Born before 1957 (except for health care personnel, see below)
  - Documentation of receipt of MMR
  - Laboratory evidence of immunity or disease
  - Documentation of a health care provider-diagnosed disease without laboratory confirmation is not considered evidence of immunity

Special populations
- Administer 1 dose of MMR to:
  - **Pregnant women without evidence of immunity** to rubella: Administer after pregnancy and before discharge from health care facility
  - **Non-pregnant women of childbearing age without evidence of immunity to rubella**
- Administer 2 doses of MMR at least 28 days apart to adults with **HIV infection and CD4 cell count ≥200 cells/µL** for at least 6 months
- Administer 2 doses of MMR at least 28 days apart if no evidence of immunity or 1 dose of MMR if received 1 dose previously to:
  - **Students in postsecondary educational institutions**
  - **International travelers**
  - **Health care personnel born in 1957 or later** (if born before 1957, consider MMR vaccination)
  - **Household contacts of immunocompromised persons**
- Administer 1 dose of MMR to adults who **previously received 2 doses of measles-containing vaccine who are identified by public health as at increased risk for mumps in an outbreak**
- MMR is contraindicated for pregnant women and adults with severe immunodeficiency

Measles, mumps, and rubella vaccination

General information
- Adults born in 1957 or later without acceptable evidence of immunity to measles, mumps, or rubella (defined below) should receive 1 dose of measles, mumps, and rubella vaccine (MMR) unless they have a medical contraindication to the vaccine,

Footnotes. Recommended immunization schedule for adults age 19 years or older, United States, 2018

1. **Influenza vaccination**
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/flu.html

General Information
- Administer 1 dose of age-appropriate inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV) annually
- Available options for adults include:
  - High-dose or adjuvanted IIV for adults age 65 years or older
  - Intradermal IIV for adults age 18 through 64 years

3. **Measles, mumps, and rubella vaccination (revision pending ACIP recommendation)**

General Information
- Administer to adults **without evidence of immunity to measles, mumps, or rubella** 1 dose of measles, mumps, and rubella vaccine (MMR)
- Evidence of immunity is:
  - Born before 1957 (except for health care personnel, see below)
  - Documentation of receipt of MMR
  - Laboratory evidence of immunity or disease
- Documentation of a health care provider-diagnosed disease without laboratory confirmation is not considered evidence of immunity

Special populations

5. **recommendation)**
www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/shingles.html

General Information
- Adults age 60 years or older should receive 1 dose of zoster vaccine live (ZVL), regardless of whether they had a prior episode of herpes zoster.