2018 Adult Immunization Schedule Updates

- Recommended use of recombinant zoster vaccine
- Recommended use of MMR in mumps outbreak setting
- Updated ACIP recommendations in prevention of hepatitis B
- FDA licensure of conjugate 1018-adjuvanted hepatitis B vaccine
Recommended Immunization Schedule for Adults Aged 19 Years or Older, United States, 2018

In February 2018, the Recommended Immunization Schedule for Adults Aged 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 adult immunization schedule was also 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). The schedule is published in its entirety in the Journal of the American Medical Association. The 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. Note the following 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 identifies 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 multidose 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.

Special populations that need additional considerations include:

- Pregnant women. Pregnant women should receive the tetanus, diphtheria, and acellular pertussis vaccine (Tdap) during pregnancy and the influenza vaccine during or before pregnancy. Live vaccines (e.g., measles, mumps, and rubella vaccine [MMR]) 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 vaccine) are generally contraindicated.

High-level immunosuppression includes HIV infection with a CD4 cell 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), and receipt of cancer chemotherapy. Other immunocompromising conditions and immunosuppressive medications to consider when vaccinating adults can be found in FAD’s Clinical Practice Guidelines for Vaccination of the Immunocompromised Host. Additional information on vaccinating immunocompromised adults is in General Adult Practice Guidelines for Immunization.*

Additional resources for health care providers include:

- Details on vaccines recommended for adults and complete ACIP statements at www.cdc.gov/vaccines/hcp/acip-recs/index.html
- Vaccine Information Statements that explain benefits and risks of vaccines at www.cdc.gov/vaccines/hcp/vis/index.html
- Information and resources on vaccinating pregnant women at www.cdc.gov/vaccines/adults/rec-va/pregnant.html
- Information on travel vaccine requirements and recommendations at www.cdc.gov/travel/destinations/list
- CDC Vaccine Schedules App for immunization service providers to download at www.cdc.gov/vaccines/schedules/hcp/schedule-app.html
- Adult Vaccination Quiz for self-assessment of vaccination needs based on age, health conditions, and other indications at www2.cdc.gov/rp/adultimmunize/default.asp
- Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger at www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html

Report suspected cases of reportable vaccine-preventable diseases to the local or state health department, and report all clinically significant postvaccination events to the Vaccine Adverse Event Reporting System (VAERS) at www.vaers.hhs.gov or by telephone, 800-822-7967. All vaccines included in the 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/cdcinfo 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 are used for vaccines in the adult immunization schedule (in order of their appearance):

- IPV inactivated poliovirus vaccine
- Tdap tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
- Td tetanus toxoid and diphtheria toxoids
- MMR measles, mumps, and rubella vaccine
- VAC varicella vaccine
- RVZI recombinant zoster vaccine
- ZVL zoster vaccine live
- HPV vaccine human papillomavirus vaccine
- PCV13 13-valent pneumococcal conjugate vaccine
- PPVS23 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

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>19–21 years</th>
<th>22–26 years</th>
<th>27–49 years</th>
<th>50–64 years</th>
<th>≥65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza^1</td>
<td>1 dose annually</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Tdap^2 or Td^3</td>
<td></td>
<td>1 dose Tdap, then Td booster every 10 yrs</td>
<td></td>
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<tr>
<td>MMR^4</td>
<td>1 or 2 doses depending on indication (if born in 1957 or later)</td>
<td></td>
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<tr>
<td>VAR^5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 doses</td>
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<tr>
<td>RZV^6 (preferred)</td>
<td></td>
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<td></td>
<td></td>
<td>2 doses RZV (preferred)</td>
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<tr>
<td>or ZVL^5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 dose ZVL</td>
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<tr>
<td>HPV–Female^6</td>
<td>2 or 3 doses depending on age at series initiation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>HPV–Male^6</td>
<td>2 or 3 doses depending on age at series initiation</td>
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<tr>
<td>PCV13^7</td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
<td></td>
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<tr>
<td>PPSV23^7</td>
<td>1 or 2 doses depending on indication</td>
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<td>1 dose</td>
</tr>
<tr>
<td>HepA^8</td>
<td></td>
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<tr>
<td>HepB^9</td>
<td></td>
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<td></td>
<td></td>
<td>3 doses</td>
</tr>
<tr>
<td>MenACWY^10</td>
<td>1 or 2 doses depending on indication, then booster every 5 yrs if risk remains</td>
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<td></td>
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<tr>
<td>MenB^16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 or 3 doses depending on vaccine</td>
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<tr>
<td>Hib^11</td>
<td>1 or 3 doses depending on indication</td>
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</tr>
</tbody>
</table>

\^1 Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection
\^2 Recommended for adults with other indications
\^3 No recommendation
<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy</th>
<th>Immuno-compromised (excluding HIV infection)</th>
<th>HIV Infection CD4+ count (cells/µL)</th>
<th>Asplenia, complement deficiencies</th>
<th>End-stage renal disease, on hemodialysis</th>
<th>Heart or lung disease, alcoholism</th>
<th>Chronic liver disease</th>
<th>Diabetes</th>
<th>Health care personnel</th>
<th>Men who have sex with men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>1 dose annually</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Tdap† or Td‡</td>
<td>1 dose Tdap each pregnancy</td>
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<td></td>
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<tr>
<td>MMR†</td>
<td>contraindicated</td>
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<tr>
<td>VAR†</td>
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<tr>
<td>RZV*(preferred)</td>
<td>2 doses RZV at age ≥50 yrs (preferred)</td>
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<tr>
<td>ZVL*</td>
<td>contraindicated</td>
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<tr>
<td>HPV-Female‡</td>
<td>3 doses through age 26 yrs</td>
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<td>2 or 3 doses through age 26 yrs</td>
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<tr>
<td>HPV-Male‡</td>
<td>3 doses through age 26 yrs</td>
<td></td>
<td>2 or 3 doses through age 21 yrs</td>
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<tr>
<td>PCV13†</td>
<td>1 dose</td>
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<tr>
<td>PPSV23†</td>
<td>1, 2, or 3 doses depending on indication</td>
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<tr>
<td>HepA*</td>
<td>2 or 3 doses depending on vaccine</td>
<td></td>
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<tr>
<td>HepB*</td>
<td>3 doses</td>
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<tr>
<td>MenACWY*</td>
<td>1 or 2 doses depending on indication, then booster every 5 yrs if risk remains</td>
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<tr>
<td>MenB*</td>
<td>2 or 3 doses depending on vaccine</td>
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<tr>
<td>Hib*</td>
<td>3 doses HSCT recipients only</td>
<td></td>
<td>1 dose</td>
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</tbody>
</table>

- **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**
Footnotes. Recommended immunization schedule for adults aged 19 years or older, United States, 2018

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

   **General Information**
   - Any dose of age-appropriate inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIIV) annually
   - 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/hsw/protect/vaccine/vaccines.htm

   **Special populations**
   - **Pregnant women**
     - Adults with diabetes only recommend
     - Adults with diabetes only recommend
   - **Elderly persons**
     - Adults with diabetes only recommend

2. Tetanus, diphtheria, and pertussis vaccination
   www.cdc.gov/vaccines/hcp/ads/vacc-specific/dtap-d.html

   **General Information**
   - Adults who received Tetanus, diphtheria, and pertussis vaccination (Td) as an adult or child (ordinarily recommended at age 11-12 years) 1 dose of Tdap follow by a dose of tetanus and diphtheria toxoid (Td) booster every 10 years
   - Information on the use of Tdap or Td at tetanus prophylaxis in wound management is available at www.cdc.gov/mmwr/preview/mmwrhtml/mm6121z1.htm

   **Special populations**
   - **Pregnant women**
     - Administer 1 dose of Tdap during each pregnancy, preferably in the early part of gestational weeks 26-28

3. Measles, mumps, and rubella vaccination
   www.cdc.gov/vaccines/hcp/ads/vacc-specific/mmrv.html

   **General Information**
   - Administer 1 dose of measles, mumps, and rubella vaccine (MMR) to all adults with no evidence of immunity to measles, mumps, or rubella
   - **Evidence of immunity is**
     - Born before 1957 (except for health care personnel, see below)
     - Document 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**
   - **Pregnant women**
     - Administer 1 dose of MMR (if pregnant, administer MMR after pregnancy and before discharge from health care facility)

4. Varicella vaccination
   www.cdc.gov/vaccines/hcp/ads/vacc-specific/varicella.html

   **General Information**
   - Administer live vaccine without evidence of immunity to varicella 2 doses of varicella vaccine (VAR) 4-6 weeks apart if previously received 1 dose of varicella vaccine (VAR) 1 dose of VAR 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)
   - Laboratory evidence of immunity or disease
   - 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

   **Special populations**
   - Administer 2 doses of VAR 4-6 weeks apart if previously received 1 dose of varicella vaccine (VAR) 1 dose of VAR at least 4 weeks after the first dose
   - **Pregnant women**
     - Administer 1 dose of VAR at least 4 weeks after the first dose
   - **Special populations**
     - Adults with immunocompromising conditions including HIV infection

5. Zoster vaccination
   www.cdc.gov/vaccines/hcp/ads/vacc-specific/zhiguel.html

   **General Information**
   - Administer 2 doses of recombuit model zoster vaccine (RV2) 2-6 months apart to adults aged 50 years or older of all ages at high risk of herpes zoster or reactivity of herpes zoster vaccine (ZVL)

   **Special populations**
   - **Pregnant women**
     - Administer 2 doses of ZVL 2 months apart to adults who previously received 1 dose of ZVL 2 months after ZVL
   - For adults aged 60 years or older, administer either RV2 or ZVL (ZVL is preferred)

6. Human papillomavirus vaccination
   www.cdc.gov/vaccines/hcp/ads/vacc-specific/hpv.html

   **General Information**
   - Administer human papillomavirus (HPV) vaccine to females through age 26 years and males through age 21 years
   - The number of doses of HPV vaccine to be administered depends on age at initial HPV vaccination

   **Special populations**
   - **Pregnant women**
     - No previous dose of HPV vaccine: Administer 3 doses
     - 1 dose of HPV vaccine: Administer 3 doses

7. Pneumococcal vaccination
   www.cdc.gov/vaccines/hcp/ads/vacc-specific/pneumococcal.html

   **General Information**
   - Administer to immunocompetent adults aged 65 years or older: 1 dose of 13-valent pneumococcal conjugate vaccine (PCV13), if not previously administered, followed by 1 dose of 23-valent pneumococcal polysaccharide vaccine (PPSV23) 1 year after PCV13; if PPSV23 was previously administered but not PCV13, administer PCV13 at least 1 year after PPSV23

   **Special populations**
   - 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/spd/pneumo/downloads/pneumo-vaccine-timing.pdf
Special populations:
- Administer to adults aged 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 3 years after PCV23):
  - Chronic heart disease (excluding hypertension)
  - Chronic lung disease
  - Chronic liver disease
  - Alcoholism
  - Diabetes mellitus
  - Cigarette smoking
- Administer to adults aged 19 years or older with the following indications: 1 dose of PPSV23 followed by 1 dose of PCV13 at least 8 weeks after PCV13, and 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, and administer another dose of PPSV23 at least 5 years after the last dose of PCV13:
  - Immunodeficiency (including HIV or T-lymphocyte deficiency, complement deficiencies, and phagocytic disorders)
  - HIV infection
  - Anatomical or functional asplenia (including sickle cell disease and other hemoglobinopathies)
  - Chronic renal failure and nephrotic syndrome
- Administer to adults aged 19 or older with the following indications: 1 dose of PCV13 followed by 1 dose of PPSV23 at least 6 weeks after PCV13:
  - Cerebrospinal fluid leak
  - Cochlear implant

8. Hepatitis A vaccination

General information:
- Administer to adults who have a specific risk (see below), or lack a risk factor but want protection:
  - 2-dose series of single antigen hepatitis A vaccine (HepA
  - 6 to 12 months or VaxA at 0 and 6 to 18 months: minimum interval 6 months)
  - 3-dose series of combined hepatitis A and hepatitis B vaccine (HepA
  - Special populations:
    - Administer HepA or HepA+B to adults with the following indications:
      - Travel or work in countries with high or intermediate hepatitis A endemicity
      - Men who have sex with men
      - Injection or noninjection drug use
      - Work with hepatitis A virus in a research laboratory or with nonhuman 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) or the first dose as soon as the adoption is planned:
      - Healthy adults through age 40 years who have recently been exposed to hepatitis A virus; adults older than age 40 years may receive HepA or HepA+B if hepatitis A immunoglobulin cannot be obtained

9. Hepatitis B vaccination

General information:
- Administer to adults who have a specific risk (see below), or lack a risk factor but want protection:

Special populations:
- Administer HepA or HepA+B to adults with the following indications:
  - Chronic liver disease (e.g., hepatitis C infection, cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alcoholic liver transplant [aLT] or aspartate aminotransferase [aST] level greater than twice the upper limit of normal)
  - HIV infection
  - Perinatal or sexual risk of exposure to blood (e.g., household contacts of hepatitis B surface antigen [HBsAg]-positive persons; young persons younger than age 60 years with diabetes mellitus or 60 years or older with diabetes mellitus based on individual clinical decision; adults in predialysis care or receiving hemodialysis or peritoneal dialysis; current 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])
  - Recieve care in centers where 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 sex for injection drug users or MSM, H BV testing and treatment facilities, and correctional facilities)
  - Travel to countries with high or intermediate hepatitis B endemicity

10. Meningococcal vaccination

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 and other hemoglobinopathies)
  - HIV infection
  - Persistent complement component deficiency
  - Ehlers-Danlos disease
  - 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 or to live in countries where meningococcal disease is hyperendemic or epidemical, including countries in the African meningitis belt and during the Hajj
    - At risk from a meningococcal disease outbreak attributed to serogroup A, C, W, or Y
    - Microbiologists routinely exposed to Neisseria meningitides
    - Military recruits
    - First-year college students who live in residential housing (if they 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 aged 16-23 years (preferred age is 16-18 years) who are not at increased risk 2-dose series of MenB-4C (Bexsero) at least 1 month apart or 3-dose series of MenB-HBp (Truminal) at least 6 months apart
- MenB-4C and MenB-HBp are not interchangeable

Special populations:
- Administer 2-dose series of MenB-4C at least 1 month apart or 3-dose series of MenB-HBp 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
  - Ehlers-Danlos use
  - At risk from a meningococcal disease outbreak attributed to serogroup B
  - Microbiologists routinely exposed to Neisseria meningitides

11. Haemophilus influenzae type b vaccination

Special populations:
- Serogroups A, C, W, and Y meningococcal vaccine (MenACWY)
### Table. Contraindications and precautions for vaccines recommended for adults aged 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 recipients.

**Contraindications and precautions for vaccines routinely recommended for adults**

<table>
<thead>
<tr>
<th>Vaccine(s)</th>
<th>Contraindications</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>All vaccines routinely recommended for adults</td>
<td>Severe reaction, e.g., anaphylaxis, after a previous dose or to a vaccine component</td>
<td>Moderate or severe acute illness with or without fever</td>
</tr>
</tbody>
</table>

**Additional contraindications and precautions for vaccines routinely recommended for adults**

<table>
<thead>
<tr>
<th>Vaccine(s)</th>
<th>Additional Contraindications</th>
<th>Additional Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV*</td>
<td></td>
<td>History of Guillain-Barre syndrome within 6 weeks after previous influenza vaccination</td>
</tr>
<tr>
<td>IV*</td>
<td></td>
<td>Egg allergy other than hives, e.g., angioedema, respiratory distress, laryngeal edema, or systemic reaction; or required epinephrine or another emergency medical intervention (IV should be administered in an inpatient or outpatient medical setting and under the supervision of a health care provider who is able to recognize and manage severe allergic conditions)</td>
</tr>
<tr>
<td>1d, 1d</td>
<td>For particulate-containing vaccines, anaphylaxis, e.g., coma, disseminated 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</td>
<td>Guillain-Barre syndrome within 6 weeks after a previous dose of tetanus toxoid-containing vaccine</td>
</tr>
<tr>
<td>MMR²</td>
<td>Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy, human immunodeficiency virus (HIV) infection with severe immunocompromise</td>
<td>Recent (within 11 months) receipt of antibody-containing blood product (specific interval) depends on product²</td>
</tr>
<tr>
<td>VAR²</td>
<td>Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy, HIV infection with severe immunocompromise</td>
<td>History of thrombocytopenia or thrombocytopenic purpura</td>
</tr>
<tr>
<td>ZVL²</td>
<td>Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy, HIV infection with severe immunocompromise</td>
<td>Need for tuberculosis skin testing¹</td>
</tr>
<tr>
<td>HPV vaccine</td>
<td>Severe allergic reaction to any vaccine-containing diphtheria toxoid</td>
<td>Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination avoid use of these antiviral drugs for 14 days after vaccination</td>
</tr>
<tr>
<td>PCV13</td>
<td>Severe allergic reaction to any vaccine-containing diphtheria toxoid</td>
<td>Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination avoid use of these antiviral drugs for 14 days after vaccination</td>
</tr>
</tbody>
</table>

2. MMR may be administered together with Tdap on the same day, if not administered on the same day separate live vaccines at least 28 days.
3. Immunocompromised host is considered to be daily receipt of 20 mg or more prednisone equivalent or 2 or more weeks. Vaccination should be deferred for at least 1 month after discontinuation of immunosuppressive therapy. Providers should consult ACIP recommendations for complete information on the use of 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 practices guidance of the Advisory Committee on Immunization Practices (ACIP). Available at www.cdc.gov/vaccines/hcp/policy/managing-immune-globulin.pdf.
5. Measles vaccination may temporarily suppress tuberculin reactivity. Measles-containing vaccine may be administered on the same day as tuberculin skin testing, but should be postponed for at least 4 weeks after vaccination.


### Abbreviations of vaccines

- **IV**: Inactivated influenza vaccine
- **RIV**: Recombinant influenza vaccine
- **Tdap**: Tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine
- **td**: Tetanus and diphtheria toxoids
- **MMR**: Mumps, measles, and rubella vaccine
- **VAR**: Varicella vaccine
- **ILV**: Recombinant zoster vaccine
- **ZVL**: Acellular pertussis vaccine
- **HPV**: Human papillomavirus vaccine
- **PCV13**: 13-valent pneumococcal conjugate vaccine
- **PPSV23**: 23-valent pneumococcal polysaccharide vaccine
- **HepA**: Hepatitis A vaccine
- **HepB**: Hepatitis B vaccine
- **HepA/HepB**: Hepatitis A and hepatitis B vaccines
- **Hept**: Hepatitis E vaccine
- **MenACWY**: MenACWY serogroups A, C, W, and Y meningococcal vaccine
- **MenB**: MenB serogroup B meningococcal vaccine
- **Hib**: Hib vaccine
- **Pneumococcal influenza type b vaccine**
2018 Adult Immunization Updates – Zoster Vaccination

- Recombinant zoster vaccine (RZV) licensed by FDA on October 20
- Administer 2 doses RZV 2–6 mos apart to adults ≥50y regardless of past herpes zoster or receipt of zoster vaccine live (ZVL)
- Administer RZV 2–6 mos apart to adults who previously received ZVL at least 2 mos after ZVL
- For adults ≥60y, administer either RZV or ZVL (RZV is preferred)
- Administer RZV to age-eligible adults with chronic health conditions including diabetes, chronic heart/lung/liver/kidney ds, asplenia, complement deficiencies
- Pending considerations on use of RZV in immunocompromising conditions including HIV infection
- No data on pregnant women (consider delay)

2018 Adult Immunization Updates – Mumps Vaccination

- Routine mumps vaccination recommendations
  - Children – 2 doses MMR during K-12 (12–15 mos and 4–6 yrs for measles)
  - Adults – 2 doses MMR for high risk (students at post-high school educational institutions, health care personnel, international travelers)

- Multiple outbreaks of mumps and high numbers of reported cases since 2015, many among young adults who received 2 doses MMR

- Updated ACIP recommendations on use of MMR during mumps outbreak
  - Administer 1 dose MMR to persons who previously received ≤2 doses mumps-containing vaccine and identified by public health authority to be at increased risk during mumps outbreak

ACIP Updates Hepatitis B Prevention

- New or updated ACIP recommendations for children
  - Universal HepB within 24 hrs of birth for medically stable infants weighing ≥2,000 g
  - Test HBsAg(+) pregnant women for hepatitis B virus deoxyribonucleic acid (HBV DNA)
  - Test postvaccination serology for infants whose mother’s HBsAg status unknown indefinitely (e.g., when a parent or person with lawful custody surrenders an infant confidentially shortly after birth)
  - Single-dose revaccination for infants born to HBsAg(+) women when not respond to initial vaccine series
  - Removal of permissive language for delaying birth dose after hospital discharge

- Relevant for adults
  - Vaccinate persons with chronic liver disease (hepatitis C virus [HCV] 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)

New Hepatitis B Vaccine for Adults

- FDA licensed (Nov 9, 2017) single antigen HepB (HEPLISAV-B, Dynavax Technologies Corp.) for all HBV subtypes for ≥18y
- 5th inactivated HepB in U.S. (Engerix-B, Recombivax HB, Pediarix, Twinrix)
- Contains yeast-derived recombinant HBsAg with 1018 adjuvant (immunostimulatory sequences) that binds Toll-like receptor 9 to stimulate directed immune response
- 2 doses 1 month apart
Heplisav-B – Seroprotection and Safety

- **Immunogenicity**
  - 90.0%–100% vs. 70.5%–90.2% in comparison group (3 doses Engerix-B)
  - Diabetes Type II: 90.0% vs. 65.1% (3 doses Engerix-B)
  - Chronic kidney disease: 89.9% (3 doses) vs. 81.1% (4 double doses Engerix-B)

- **Safety and reactogenicity**
  - Mild and serious adverse events similar
    - Mild: 45.6% vs. 45.7% (Engerix-B)
    - Serious: 5.4% vs. 6.3% (Engerix-B)
  - Cardiovascular events
    - 0.27% vs. 0.14% (Engerix-B)
  - Potentially immune-mediated adverse events (e.g., granulomatosis with polyangiitis, Grave’s disease)
    - 0.1%–0.2% vs. 0%–0.7% (Engerix-B)


Pending ACIP Deliberation on Heplisav-B

- Use of Heplisav-B in prevention of hepatitis B for ≥18y up for ACIP vote in February 2018
- Other considerations
For more information, contact CDC
1-800-CDC-INFO (232-4636)

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