In October 2018, the Advisory Committee on Immunization Practices (ACIP) voted to approve the Recommended Adult Immunization Schedule, United States, 2019, for adults aged 19 years or older. The 2019 adult immunization schedule, available at www.cdc.gov/vaccines/schedules, summarizes ACIP recommendations in 2 tables and accompanying notes (Figure). The full ACIP recommendations for each vaccine are available at www.cdc.gov/vaccines/hcp/acip-recs/index.html. The 2019 schedule has also been approved by the Director of the Centers for Disease Control and Prevention (CDC) and 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.

The ACIP’s recommendations on use of each vaccine are developed after in-depth review of vaccine-related data, including disease epidemiology and burden of disease, vaccine efficacy and effectiveness, vaccine safety, the quality of evidence, feasibility of program implementation, and economic analyses of immunization policy (1). ACIP recommendations can be complex and challenging to implement. The purpose of the annually published schedule is to consolidate and summarize updates to ACIP recommendations on vaccination of adults and assist providers in implementing current ACIP recommendations. The use of trade names of vaccines in this article and in the schedule is for identification purposes only and does not imply endorsement by the ACIP or the CDC.

Changes to the 2019 Adult Immunization Schedule

Updated ACIP Recommendations

**Influenza vaccination** (2). In June 2018, the ACIP updated recommendations on the use of live attenuated influenza vaccine (LAIV) (FluMist Quadrivalent, AstraZeneca) after 2 influenza seasons (2016–2017 and 2017–2018) during which use of LAIV was not recommended in the United States. For the 2018–2019 season, any licensed influenza vaccine that is appropriate for the age and health status of the patient may be used. LAIV is an option for adults through age 49 years, except for those who have immunocompromising conditions, including HIV infection; have anatomical or functional asplenia; are pregnant; have close contact with or are caregivers of severely immunocompromised persons in a protected environment; have received influenza antiviral medications in the previous 48 hours; or have cerebrospinal fluid leak or a cochlear implant. Those with a history of Guillain-Barré syndrome within 6 weeks of a previous dose of influenza vaccine generally should not be vaccinated.

**Hepatitis B vaccination** (3). In February 2018, the ACIP recommended use of the new single-antigen recombinant hepatitis B vaccine with a novel cytosine-phosphate-guanine 1018 oligodeoxynucleotide adjuvant (Heplisav-B, Dynavax) for prevention of hepatitis B virus infection in adults aged 18 years or older. Approved by the U.S. Food and Drug Administration in November 2017, Heplisav-B is routinely administered in 2 doses at least 4 weeks apart. It can be used as a substitute in a 3-dose series with a different hepatitis B vaccine, but a valid 2-dose series requires 2 doses of Heplisav-B with at least 4 weeks between them. When feasible, a vaccine from the same manufacturer should be used to complete the vaccination series. However, vaccination should not be deferred if the previously administered hepatitis B vaccine is unknown or if a vaccine from the same manufacturer is not available. A pregnant woman with an indication for hepatitis B vaccination should not receive Heplisav-B because no safety data are available on its use during pregnancy.

**Hepatitis A vaccination** (4). In October 2018, the ACIP recommended adding homelessness as an indication for routine hepatitis A vaccination with a 2-dose series of single-antigen hepatitis A vaccine (Havrix, GlaxoSmithKline; Vaqta, Merck) or a 3-dose series of combination hepatitis A and B vaccine (Twinrix, Glaxo SmithKline). Other populations that are at increased risk for hepatitis A virus infection or severe hepatitis A disease and are recommended to receive routine vaccination include persons with chronic liver disease or clotting factor disorders, travelers in countries with high or intermediate endemic hepatitis A, persons with close personal contact with an international adoptee in the first 60 days after arrival from a country with high or intermediate endemic hepatitis A, men who have sex with men, persons who use injection or noninjection drugs, and persons who work with hepatitis A virus in a laboratory or nonhuman primates infected with the virus (5–7). In addition, any person who is not at risk for hepatitis A virus infection but wants protection against it may be vaccinated.
Recommended Adult Immunization Schedule
for ages 19 years or older

UNITED STATES 2019

How to use the adult immunization schedule
1. Determine recommended vaccinations by age (Table 1)
2. Assess need for additional recommended vaccinations by medical condition and other indications (Table 2)
3. Review vaccine types, frequencies, and intervals and considerations for special situations (Notes)

Vaccines in the Adult Immunization Schedule*

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Abbreviations</th>
<th>Trade names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemophilus influenza type b vaccine</td>
<td>Hib</td>
<td>AdHIB, Hibrix</td>
</tr>
<tr>
<td>Hepatitis A vaccine</td>
<td>HepA</td>
<td>Havrix, Vaqta</td>
</tr>
<tr>
<td>Hepatitis A and hepatitis B vaccine</td>
<td>HepA-HepB</td>
<td>Twinrix</td>
</tr>
<tr>
<td>Hepatitis B vaccine</td>
<td>HepB</td>
<td>Engerix-B, Recombivax HB, Heplisav-B</td>
</tr>
<tr>
<td>Human papillomavirus vaccine</td>
<td>HPV vaccine</td>
<td>Gardasil 9</td>
</tr>
<tr>
<td>Influenza vaccine, inactivated</td>
<td>IIV</td>
<td>Many brands</td>
</tr>
<tr>
<td>Influenza vaccine, live attenuated</td>
<td>LAIV</td>
<td>FluMist Quadrivalent</td>
</tr>
<tr>
<td>Influenza vaccine, recombinant</td>
<td>RIV</td>
<td>Flublok Quadrivalent</td>
</tr>
<tr>
<td>Measles, mumps, and rubella vaccine</td>
<td>MMR</td>
<td>M-M-R II</td>
</tr>
<tr>
<td>Meningococcal serogroups A, C, W, Y vaccine</td>
<td>MenACWY</td>
<td>Menactra, Menveo</td>
</tr>
<tr>
<td>Meningococcal serogroup B vaccine</td>
<td>MenB-4C, MenB-FHbp</td>
<td>Bexsero, Trumeba</td>
</tr>
<tr>
<td>Pneumococcal 13-valent conjugate vaccine</td>
<td>PCV13</td>
<td>Pevnax 13</td>
</tr>
<tr>
<td>Pneumococcal 23-valent polysaccharide vaccine</td>
<td>PPSV23</td>
<td>Pneumovax</td>
</tr>
<tr>
<td>Tetanus and diphtheria toxoids</td>
<td>Td</td>
<td>Tenivac, Td vaccine</td>
</tr>
<tr>
<td>Tetanus and diphtheria toxoids and acellular pertussis vaccine</td>
<td>Tdap</td>
<td>Adacel, Boostrix</td>
</tr>
<tr>
<td>Varicella vaccine</td>
<td>VAR</td>
<td>Varivax</td>
</tr>
<tr>
<td>Zoster vaccine, recombinant</td>
<td>RZV</td>
<td>Shingrix</td>
</tr>
<tr>
<td>Zoster vaccine live</td>
<td>ZVL</td>
<td>Zostavax</td>
</tr>
</tbody>
</table>

Recommended by the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/acip) and approved by the Centers for Disease Control and Prevention (www.cdc.gov), American College of Physicians (www.acponline.org), American Academy of Family Physicians (www.aafp.org), American College of Obstetricians and Gynecologists (www.acog.org), and American College of Nurse-Midwives (www.midwife.org).

Report
- Suspected cases of reportable vaccine-preventable diseases or outbreaks to the local or state health department
- Clinically significant post-vaccination reactions to the Vaccine Adverse Event Reporting System at www.vaers.hhs.gov or 800-822-7967

Injury claims
All vaccines included in the adult immunization schedule except pneumococcal 23-valent 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 800-338-2382.

Questions or comments
Contact CDC at www.cdc.gov/cdc-info or 800-CDC-INFO (800-232-4636), in English or Spanish, 8 a.m.–8 p.m. ET, Monday through Friday, excluding holidays.

Download the CDC Vaccine Schedules App for providers at www.cdc.gov/vaccines/schedules/hcp/schedule-app.html

Helpful information
- Complete ACIP recommendations: www.cdc.gov/vaccines/hcp/acip-recs/index.html
- General Best Practice Guidelines for Immunization: www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html
- Vaccine Information Statements: www.cdc.gov/vaccines/hcp/vis/index.html
- Travel vaccine recommendations: www.cdc.gov/travel
- Recommended Child and Adolescent Immunization Schedule, United States, 2019: www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html

*Administer recommended vaccines if vaccination history is incomplete or unknown. Do not restart or add doses to vaccine series for extended intervals between doses. The use of trade names is for identification purposes only and does not imply endorsement by the ACIP or CDC.
Table 1 Recommended Adult Immunization Schedule by Age Group
United States, 2019

<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 inactivated (IIV) or Influenza recombinant (RIV)</td>
<td></td>
<td></td>
<td>1 dose annually</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza live attenuated (LAIV)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Tdap or Td)</td>
<td></td>
<td></td>
<td></td>
<td>1 dose Tdap, then Td booster every 10 yrs</td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella (VAR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 doses</td>
</tr>
<tr>
<td>Zoster recombinant (RZV) (preferred)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 doses</td>
</tr>
<tr>
<td>Zoster live (ZVL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>or</td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Male</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal conjugate (PCV13)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 dose</td>
</tr>
<tr>
<td>Pneumococcal polysaccharide (PPSV23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A (HepA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B (HepB)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal A, C, W, Y (MenACWY)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1 or 2 doses depending on indication, then booster every 5 yrs if risk remains</td>
</tr>
<tr>
<td>Meningococcal B (MenB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection
Recommended vaccination for adults with an additional risk factor or another indication
No recommendation

1 dose annually
2 doses
1 or 2 doses depending on indication
1 dose
2 or 3 doses depending on age at initial vaccination
1 or 3 doses depending on indication
1 or 2 doses depending on indication
### Table 2: Recommended Adult Immunization Schedule by Medical Condition and Other Indications
United States, 2019

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Pregnancy</th>
<th>Immuno-compromised (excluding HIV infection)</th>
<th>HIV infection</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>IIV or RIV</td>
<td>1 dose annually</td>
<td>CONTRAINDIANTED</td>
<td>PRECAUTION</td>
<td>1 dose annually</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAIV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tdap or Td</td>
<td>1 dose Tdap each pregnancy</td>
<td>1 dose Tdap, then Td booster every 10 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MMR</td>
<td>CONTRAINDIANTED</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAR</td>
<td>CONTRAINDIANTED</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>RZV (preferred)</td>
<td>DELAY</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>ZVL</td>
<td>CONTRAINDIANTED</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV Female</td>
<td>DELAY</td>
<td>3 doses through age 26 yrs</td>
<td></td>
<td>2 or 3 doses through age 26 yrs</td>
<td></td>
<td>2 or 3 doses through age 21 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPV Male</td>
<td>3 doses through age 26 yrs</td>
<td></td>
<td></td>
<td>2 or 3 doses through age 21 yrs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCV13</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPSV23</td>
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</tr>
<tr>
<td>HepA</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>HepB</td>
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<td></td>
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</tr>
<tr>
<td>MenACWY</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MenB</td>
<td>PRECAUTION</td>
<td>2 or 3 doses depending on vaccine and indication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib</td>
<td>3 doses HSCT recipients only</td>
<td>Recommended vaccination for adults with an additional risk factor or another indication</td>
<td>Recommended vaccination for adults who meet age requirement, lack documentation of vaccination, or lack evidence of past infection</td>
<td>Precaution—vaccine might be indicated if benefit of protection outweighs risk of adverse reaction</td>
<td>Delay vaccination until after pregnancy if vaccine is indicated</td>
<td>Contraindicated—vaccine should not be administered because of risk for serious adverse reaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Precaution for LAIV does not apply to alcoholism. 2. See notes for influenza; hepatitis B; measles, mumps, and rubella; and varicella vaccinations. 3. Hematopoietic stem cell transplant.
Recommended Adult Immunization Schedule  
United States, 2019

### Haemophilus influenzae type b vaccination

**Special situations**
- Anatomical or functional asplenia (including sickle cell disease): 1 dose Hib if previously did not receive Hib; if elective splenectomy, 1 dose Hib, preferably at least 14 days before splenectomy
- Hematopoietic stem cell transplant (HSCT): 3-dose series Hib 4 weeks apart starting 6–12 months after successful transplant, regardless of Hib vaccination history

### Hepatitis A vaccination

**Routine vaccination**
- Not at risk but want protection from hepatitis A
  - Anatomical or functional asplenia (including sickle cell disease): 1 dose Hib if previously did not receive Hib; if elective splenectomy, 1 dose Hib, preferably at least 14 days before splenectomy
  - Hematopoietic stem cell transplant (HSCT): 3-dose series Hib 4 weeks apart starting 6–12 months after successful transplant, regardless of Hib vaccination history

**Special situations**
- At risk for hepatitis A virus infection: 2-dose series HepA or 3-dose series HepA-HepB as above
  - Chronic liver disease
  - Clotting factor disorders
  - Men who have sex with men
  - Injection or non-injection drug use
  - Homelessness
  - Work with hepatitis A virus in research laboratory or nonhuman primates with hepatitis A virus infection
  - Travel in countries with high or intermediate endemic hepatitis A
  - Close personal contact with international adoptee (e.g., household, regular babysitting) in first 60 days after arrival from country with high or intermediate endemic hepatitis A (administer dose 1 as soon as adoption is planned, at least 2 weeks before adoptee’s arrival)

### Hepatitis B vaccination

**Routine vaccination**
- Not at risk but want protection from hepatitis B
  - Anatomical or functional asplenia (identification of risk factor not required): 2-dose series HepB (2-dose series Heplisav-B at least 4 weeks apart (2-dose series HepB only applies when 2 doses of Heplisav-B are used at least 4 weeks apart) or 3-dose series Engerix-B or Recombivax HB at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 8 weeks between doses 2 and 3, 16 weeks between doses 1 and 3] or 3-dose series HepA-HepB (Twinrix at 0, 1, 6 months [minimum intervals: 4 weeks between doses 1 and 2, 5 months between doses 2 and 3])

**Special situations**
- At risk for hepatitis B virus infection: 2-dose (Heplisav-B) or 3-dose (Engerix-B, Recombivax HB) series HepB, or 3-dose series HepA-HepB as above
  - Hepatitis C virus infection
  - Chronic liver disease (e.g., cirrhosis, fatty liver disease, alcoholic liver disease, autoimmune hepatitis, alanine aminotransferase [ALT] or aspartate aminotransferase [AST] level greater than twice upper limit of normal)
- HIV infection
- Sexual exposure risk (e.g., sex partners of hepatitis B surface antigen [HBsAg]-positive persons; sexually active persons not in mutually monogamous relationships, persons seeking evaluation or treatment for a sexually transmitted infection, men who have sex with men)
- Current or recent injection drug use
- Percutaneous or mucosal risk for exposure to blood (e.g., household contacts of HBsAg-positive persons; residents and staff of facilities for developmentally disabled persons; health care and public safety personnel with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids; hemodialysis, peritoneal dialysis, home dialysis, and predialysis patients; persons with diabetes mellitus aged younger than 60 years and, at discretion of treating clinician, those aged 60 years or older)
- Incarcerated persons
- Travel in countries with high or intermediate endemic hepatitis A

### Human papillomavirus vaccination

**Routine vaccination**
- Females through age 26 years and males through age 21 years: 2- or 3-dose series HPV vaccine depending on age at initial vaccination; males aged 22 through 26 years may be vaccinated on basis of individual clinical decision (HPV vaccination routinely recommended at age 11–12 years)
- Age 15 years or older at initial vaccination: 3-dose series HPV vaccine at 0, 1–2, 6 months (minimum intervals: 4 weeks between doses 1 and 2, 12 weeks between doses 2 and 3, 5 months between doses 1 and 3; repeat dose if administered too soon)

**Special situations**
- Immunocompromising conditions (including HIV infection) through age 26 years: 3-dose series HPV vaccine at 0, 1–2, 6 months as above
- Men who have sex with men and transgender persons through age 26 years: 2- or 3-dose series HPV vaccine depending on age at initial vaccination as above
- Pregnancy through age 26 years: HPV vaccination not recommended until after pregnancy; no intervention needed if vaccinated while pregnant; pregnancy testing not needed before vaccination

**Notes**

**Recommended Adult Immunization Schedule  
United States, 2019**

**Hepatitis A vaccination**

**Routine vaccination**
- Not at risk but want protection from hepatitis A
  - Anatomical or functional asplenia (including sickle cell disease): 1 dose Hib if previously did not receive Hib; if elective splenectomy, 1 dose Hib, preferably at least 14 days before splenectomy
  - Hematopoietic stem cell transplant (HSCT): 3-dose series Hib 4 weeks apart starting 6–12 months after successful transplant, regardless of Hib vaccination history

**Special situations**
- At risk for hepatitis A virus infection: 2-dose series HepA or 3-dose series HepA-HepB as above
  - Chronic liver disease
  - Clotting factor disorders
  - Men who have sex with men
  - Injection or non-injection drug use
  - Homelessness
  - Work with hepatitis A virus in research laboratory or nonhuman primates with hepatitis A virus infection
  - Travel in countries with high or intermediate endemic hepatitis A
  - Close personal contact with international adoptee (e.g., household, regular babysitting) in first 60 days after arrival from country with high or intermediate endemic hepatitis A (administer dose 1 as soon as adoption is planned, at least 2 weeks before adoptee’s arrival)
### Influenza vaccination

**Routine vaccination**
- Persons aged 6 months or older: 1 dose IIV, RIV, or LAIV appropriate for age and health status annually
- For additional guidance, see [www.cdc.gov/flu/professionals/index.htm](http://www.cdc.gov/flu/professionals/index.htm)

**Special situations**
- Egg allergy, hives only: 1 dose IIV, RIV, or LAIV appropriate for age and health status annually
- Egg allergy more severe than hives (e.g., angioedema, respiratory distress): 1 dose IIV, RIV, or LAIV appropriate for age and health status annually in medical setting under supervision of healthcare provider who can recognize and manage severe allergic conditions
- Immunocompromising conditions (including HIV infection), anatomical or functional asplenia, pregnant women, close contacts and caregivers of severely immunocompromised persons in protected environment, use of influenza antiviral medications in previous 48 hours, cerebrospinal fluid leak or cochlear implant: 1 dose IIV or RIV annually (LAIV not recommended)
- History of Guillain-Barré syndrome within 6 weeks of previous dose of influenza vaccine: Generally should not be vaccinated

**Notes**

- Influenza vaccination
  - Persons aged 6 months or older: 1 dose IIV, RIV, or LAIV appropriate for age and health status annually
  - For additional guidance, see [www.cdc.gov/flu/professionals/index.htm](http://www.cdc.gov/flu/professionals/index.htm)

- **Measles, mumps, and rubella vaccination**
  - For additional guidance, see [www.cdc.gov/immunization/schedules/adult.pdf](http://www.cdc.gov/immunization/schedules/adult.pdf)

- **Meningococcal vaccination**
  - Special situations for MenACWY
    - Anatomical or functional asplenia (including sickle cell disease), HIV infection, persistent complement component deficiency, eculizumab use: 2-dose series MenACWY (Menceva, Menveo) at least 8 weeks apart and revaccinate every 5 years if risk remains
    - Travel in countries with hyperendemic or epidemic meningococcal disease, microbiologists routinely exposed to Neisseria meningitidis: 1 dose MenACWY and revaccinate every 5 years if risk remains
    - First-year college students who live in residential housing (if not previously vaccinated at age 16 years or older) and military recruits: 1 dose MenACWY

- Special situations for MenB
  - Anatomical or functional asplenia (including sickle cell disease), persistent complement component deficiency, eculizumab use, microbiologists routinely exposed to Neisseria meningitidis: 2-dose series MenB-4C (Bexsero) at least 1 month apart, or 3-dose series MenB-FHbp (Trumenba) at 0, 1–2, 6 months (if dose 2 was administered at least 6 months after dose 1, dose 3 not needed); MenB-4C and MenB-FHbp are not interchangeable (use same product for all doses in series)
  - Pregnancy: Delay MenB until after pregnancy unless at increased risk and vaccination benefit outweighs potential risks
  - Healthy adolescents and young adults aged 16 through 23 years (age 16 through 18 years preferred) not at increased risk for meningococcal disease: Based on individual clinical decision, may receive 2-dose series MenB-4C at least 1 month apart, or 2-dose series MenB-FHbp at 0, 6 months (if dose 2 was administered less than 6 months after dose 1, administer dose 3 at least 4 months after dose 2); MenB-4C and MenB-FHbp are not interchangeable (use same product for all doses in series)
**Pneumococcal vaccination**

**Routine vaccination**
- Age 65 years or older (immunocompetent): 1 dose PCV13 if previously did not receive PCV13, followed by 1 dose PPSV23 at least 1 year after PCV13 and at least 5 years after last dose PPSV23
- Previously received PPSV23 but not PCV13 at age 65 years or older: 1 dose PCV13 at least 1 year after PPSV23
- When both PCV13 and PPSV23 are indicated, administer PCV13 first (PCV13 and PPSV23 should not be administered during same visit)

**Special situations**
- Age 19 through 64 years with chronic medical conditions (chronic heart [excluding hypertension], lung, or liver disease; diabetes), alcoholism, or cigarette smoking: 1 dose PPSV23
- Age 19 years or older with immunocompromising conditions (congenital or acquired immunodeficiency [including B- and T-lymphocyte deficiency], complement deficiencies, and phagocytic disorders, HIV infection), chronic renal failure, nephrotic syndrome, leukemia, lymphoma, Hodgkin disease, generalized malignancy, iatrogenic immunosuppression [e.g., drug or radiation therapy], solid organ transplant, multiple myeloma or anatomical or functional asplenia (including sickle cell disease and other hemoglobinopathies): 1 dose PCV13 followed by 1 dose PPSV23 at least 8 weeks later, then another dose PPSV23 at least 5 years after previous PPSV23; at age 65 years or older, administer 1 dose PPSV23 at least 5 years after most recent PPSV23 (note: only 1 dose PPSV23 recommended at age 65 years or older)
- Age 19 years or older with cerebrospinal fluid leak or cochlear implant: 1 dose PCV13 followed by 1 dose PPSV23 at least 8 weeks later; at age 65 years or older, administer another dose PPSV23 at least 5 years after PPSV23 (note: only 1 dose PPSV23 recommended at age 65 years or older)

**Tetanus, diphtheria, and pertussis vaccination**

**Routine vaccination**
- Previously did not receive Tdap at or after age 11 years: 1 dose Tdap, then Td booster every 10 years

**Special situations**
- Previously did not receive primary vaccination series for tetanus, diphtheria, and pertussis: 1 dose Tdap followed by 1 dose Td at least 4 weeks after Tdap, and another dose Td 6–12 months after last Td (Td can be substituted for any Td dose, but preferred as first dose); Td booster every 10 years thereafter
- Pregnancy: 1 dose Tdap during each pregnancy, preferably in early part of gestational weeks 27–36
- For information on use of Tdap or Td as tetanus prophylaxis in wound management, see [www.cdc.gov/mmwr/volumes/67/rr/rr6702a1.htm](http://www.cdc.gov/mmwr/volumes/67/rr/rr6702a1.htm)

**Varicella vaccination**

**Routine vaccination**
- No evidence of immunity to varicella: 2-dose series VAR 4–8 weeks apart if previously did not receive varicella-containing vaccine (VAR or MMRV [measles-mumps-rubella varicella vaccine] for children); if previously received 1 dose varicella-containing vaccine: 1 dose VAR at least 4 weeks after first dose
- Evidence of immunity: U.S.-born before 1980 (except for pregnant women and health care personnel [see below]), documentation of 2 doses 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 situations**
- Pregnancy with no evidence of immunity to varicella: VAR contraindicated during pregnancy; after pregnancy (before discharge from health care facility), 1 dose VAR if previously received 1 dose varicella-containing vaccine, or dose 1 of 2-dose series VAR (dose 2: 4–8 weeks later) if previously did not receive any varicella-containing vaccine, regardless of whether U.S.-born before 1980

**Zoster vaccination**

**Routine vaccination**
- Age 50 years or older: 2-dose series RZV 2–6 months apart (minimum interval: 4 weeks; repeat dose if administered too soon) regardless of previous herpes zoster or previously received ZVL (administer RZV at least 2 months after ZVL)
- Age 60 years or older: 2-dose series RZV 2–6 months apart (minimum interval: 4 weeks; repeat dose if administered too soon) or 1 dose ZVL if not previously vaccinated (if previously received ZVL, administer RZV at least 2 months after ZVL); RZV preferred over ZVL

**Special situations**
- Pregnancy: ZVL contraindicated; consider delaying RZV until after pregnancy if RZV is otherwise indicated
- Severe immunocompromising conditions (including HIV infection with CD4 count <200 cells/μL): ZVL contraindicated; recommended use of RZV under review

**Recommended Adult Immunization Schedule United States, 2019**

**Notes**

**Pneumococcal vaccination**

**Routine vaccination**
- Age 65 years or older (immunocompetent): 1 dose PCV13 if previously did not receive PCV13, followed by 1 dose PPSV23 at least 1 year after PCV13 and at least 5 years after last dose PPSV23
- Previously received PPSV23 but not PCV13 at age 65 years or older: 1 dose PCV13 at least 1 year after PPSV23
- When both PCV13 and PPSV23 are indicated, administer PCV13 first (PCV13 and PPSV23 should not be administered during same visit)

**Special situations**
- Age 19 through 64 years with chronic medical conditions (chronic heart [excluding hypertension], lung, or liver disease; diabetes), alcoholism, or cigarette smoking: 1 dose PPSV23
- Age 19 years or older with immunocompromising conditions (congenital or acquired immunodeficiency [including B- and T-lymphocyte deficiency], complement deficiencies, and phagocytic disorders, HIV infection), chronic renal failure, nephrotic syndrome, leukemia, lymphoma, Hodgkin disease, generalized malignancy, iatrogenic immunosuppression [e.g., drug or radiation therapy], solid organ transplant, multiple myeloma or anatomical or functional asplenia (including sickle cell disease and other hemoglobinopathies): 1 dose PCV13 followed by 1 dose PPSV23 at least 8 weeks later, then another dose PPSV23 at least 5 years after previous PPSV23; at age 65 years or older, administer 1 dose PPSV23 at least 5 years after most recent PPSV23 (note: only 1 dose PPSV23 recommended at age 65 years or older)
- Age 19 years or older with cerebrospinal fluid leak or cochlear implant: 1 dose PCV13 followed by 1 dose PPSV23 at least 8 weeks later; at age 65 years or older, administer another dose PPSV23 at least 5 years after PPSV23 (note: only 1 dose PPSV23 recommended at age 65 years or older)

**Health care personnel with no evidence of immunity to varicella**: 1 dose VAR if previously received 1 dose varicella-containing vaccine, or 2-dose series VAR 4–8 weeks apart if previously did not receive any varicella-containing vaccine, regardless of whether U.S.-born before 1980
- **HIV infection with CD4 count ≥200 cells/μL with no evidence of immunity**: Consider 2-dose series VAR 3 months apart based on individual clinical decision; VAR contraindicated in HIV infection with CD4 count <200 cells/μL
- **Severe immunocompromising conditions**: VAR contraindicated
Revised Content, Format, and Graphics

Cover. Recommended Adult Immunization Schedule. The cover page of the 2019 schedule has been simplified and features a shorter title, provides basic instructions on how to use the schedule to systematically identify vaccination needs of adults, and lists routinely recommended vaccines and their standardized abbreviations and trade names. Web links have been added where providers can download the CDC Vaccine Schedules app and access reference materials on surveillance of vaccine-preventable diseases, including case identification and disease outbreak response. The cover page also has instructions on reporting suspected cases of reportable vaccine-preventable diseases to local or state health departments and significant postvaccination adverse events to the Vaccine Adverse Event Reporting System; information on the Vaccine Injury Compensation Program; and Web links to other resources, such as Vaccine Information Statements and recommended vaccines for travelers.

Table 1. Recommended Adult Immunization Schedule by Age Group. Table 1 (previously known as Figure 1) describes routine and catch-up vaccination recommendations for adults by age. Table 1 contains 1 notable change from 2018: LAIV has been listed separately from inactivated influenza vaccine (IIV) (many branded products) and recombinant influenza vaccine (RIV) (Flublok Quadrivalent, Sanofi Pasteur) for adults through age 49 years. The ACIP recommends routine annual influenza vaccination for all persons aged 6 months or older who do not have contraindications; 1 annual dose of IIV, RIV, or LAIV that is appropriate for the age and health status of the patient is recommended.

Table 2. Recommended Adult Immunization Schedule by Medical Condition and Other Indications. Table 2 (previously known as Figure 2) also lists LAIV separately from IIV and RIV. Table 2 contains 2 new recommendations: displays designated by new colors: “Precaution—vaccine might be indicated if benefit of protection outweighs risk of adverse reaction” (orange) and “Delay vaccination until after pregnancy if vaccine is indicated” (pink). LAIV is contraindicated in pregnant women and immunocompromised adults, including those with HIV infection, because it is a live vaccine. The risk of associated adverse effects from the use of LAIV in adults with functional or anatomical asplenia or complement deficiencies is not clear; however, for display purposes, the use of LAIV in this population has been designated as “contraindicated” (red). For adults with end-stage renal disease, heart or lung disease, chronic liver disease, or diabetes, LAIV has been given the “precaution” (orange) designation. This designation has also been applied to serogroup B meningococcal vaccine (MenB) (Bexsero, GlaxoSmithKline; Trumenba, Pfizer) for pregnant women; MenB should be deferred in pregnant women unless they are at increased risk for serogroup B meningococcal disease and the benefits of vaccination outweigh potential risks (B). In pregnant women, the recommended use of MenB differs from that of serogroups A, C, W, and Y meningococcal vaccine (MenACWY) (Menactra, Sanofi Pasteur; Menevor, Glaxo-SmithKline). Pregnancy should not preclude use of MenACWY if it is otherwise indicated (9). Therefore, MenACWY in pregnancy remains displayed as “Recommended vaccination for adults with an additional risk factor or another indication” (purple). The designation “Delay until after pregnancy” (pink) was applied to the use of human papillomavirus (HPV) vaccine (Gardasil 9, Merck) and recombinant zoster vaccine (RZV) (Shingrix, GlaxoSmithKline). The use of HPV vaccine is not recommended for pregnant women (10, 11), and pregnant women should consider delaying receipt of RZV (if it is indicated) until after pregnancy (12). Zoster vaccine live (ZVL) (Zostavax, Merck) is contraindicated in pregnancy (13).

Notes. Recommended Adult Immunization Schedule. Each recommended vaccine for adults in Tables 1 and 2 is accompanied by notes (previously known as footnotes), which are designed to provide additional information on routine vaccination and recommendations in special situations. The notes have been reordered alphabetically by vaccination, and superscript footnote numbers in the former figures (now tables) have been removed. Each section contains concise information on vaccine indications, dosing frequencies and intervals, and other published ACIP recommendations. New recommendations on influenza, hepatitis B, and hepatitis A vaccinations have been added to their respective sections in the notes. Recommendations on vaccination in outbreak settings in the measles, mumps, and rubella vaccination and meningococcal vaccination sections have been removed. All vaccines identified in Tables 1 and 2 (except zoster vaccines) also appear in the Recommended Immunization Schedule for Children and Adolescents, United States, 2019 (14). The notes for vaccines that appear in both the adult immunization schedule and the child and adolescent immunization schedule have been harmonized to the extent possible.

Adult Vaccination Coverage Rates

Adults are at risk for illness, hospitalization, disability, and death from vaccine-preventable diseases. The schedule is updated annually to assist providers in implementing up-to-date ACIP recommendations for adults. The overarching goal is to improve adult vaccination coverage rates in the United States.

Although modest increases in vaccination coverage rates were observed in several sectors of the adult population in 2016, the overall rates for adults in the United States have remained low (15). Among adults aged 19 years or older, the influenza vaccination coverage rate for the 2015–2016 influenza season remained similar to that for the 2014–2015 season, at 43.5%. For adults aged 65 years or older, there was a decrease of 3.1 percentage points, to 70.4%. The rate among black (39.5%) and Hispanic (33.1%) adults continued to lag behind that among white adults (46.3%).

Among pregnant women, the influenza vaccination coverage rate in the 2017–2018 influenza season was 49.1% (16) compared with 53.6% in the 2016–2017 season and 49.9% in the 2015–2016 season (17). The
coverage for tetanus, diphtheria, and acellular pertussis vaccine (Tdap) among pregnant women was 54.4% (16). The ACIP has recommended Tdap for every pregnancy since 2012 (18).

The 2016 pneumococcal vaccination coverage rate among adults aged 65 years or older was 66.9%, an increase of 3.3 percentage points from 2015 (15). These rates do not distinguish between 13-valent conjugate (Prevnar 13, Pfizer) or 23-valent polysaccharide (Pneumovax 23, Merck) pneumococcal vaccines. For adults aged 19 through 64 years who are at increased risk for pneumococcal disease, such as those with heart or lung disease or diabetes, pneumococcal vaccination coverage remained unchanged, at 24.0%. Among adults for whom Tdap vaccination could be assessed, 26.6% were estimated to be current, an increase of 3.4 percentage points from 2015. Among adults aged 60 years or older, zoster vaccine coverage was 33.4%, an increase of 2.8 percentage points from 2015. Rates of HPV vaccination coverage for females and males aged 19 through 21 years were 51.6% and 21.2%, respectively, representing increases of 9.6 and 5.5 percentage points from 2015.

**Standards of Adult Immunization Practice**

In response to the persistently low vaccination coverage rates among adults, the National Vaccine Advisory Committee updated the standards for adult immunization practice in 2014 to promote integration of vaccinations as part of routine clinical care for adults (19). The standards for adult immunization practice is a call to action for providers to assess the vaccination status of adult patients at every clinical encounter, strongly recommend needed vaccines, offer vaccines or refer patients to another provider if they do not stock vaccines, and document administered vaccines in state or local immunization information systems. The schedule is an important clinical resource that providers can use to stay current on ACIP-recommended immunizations for adults and to implement the standards for adult immunization practice.

**Adult Immunization Schedule Usability Testing**

The adult immunization schedule was first published in 2002 with the goal of enabling providers to easily identify vaccination needs of their adult patients and administer appropriate vaccines (20). In addition, providers can use the schedule to help implement use of standing orders, patient reminder and recall systems, and other strategies to vaccinate their adult patients and minimize missed opportunities. The 2002 schedule contained information on 8 vaccines and 6 special-indication categories for which vaccines were routinely recommended, such as pregnancy and HIV infection. In contrast, the 2019 schedule contains information on routinely recommended uses for 17 types of vaccines in 11 antigen groups and 10 special-indication categories. As ACIP recommendations for adults became more complex, a need arose to translate the recommendations more effectively and improve messaging to busy providers.

In 2016-2017, the ACIP and the CDC conducted an ad hoc review of the 2016 schedule in collaboration with the Georgia Institute of Technology chapter of the Human Factors and Ergonomics Society (21). The goal was to apply user-centered visual design principles to improve the messaging efficiency of the schedule while maintaining a form that did not deviate from established user expectations. This initial review yielded many recommendations that were based on cognitive ergonomics and design principles. Several of these recommendations, such as using blocks instead of bars in figures for simplicity and clarity, were adopted in the 2017 and 2018 schedules.

In 2017, the ACIP and the CDC began formal usability testing of the schedule that included in-depth interviews with primary care physicians, nurse practitioners and physician assistants, pharmacists, nurses, and medical assistants who reported being familiar with the schedule (22). In 2018, several versions of adult immunization schedule redesigns based on these interviews were prepared, and an Internet survey of internal medicine and family medicine physicians was conducted to assess their impressions of and preferences for redesigned drafts.

The qualitative evaluation of the 2017 schedule, which featured in-depth interviews with 48 providers, revealed that most were familiar with Figure 1 (recommended adult immunization schedule by age group) but fewer were familiar with Figure 2 (recommended adult immunization schedule by medical condition and other indications). Interviewees were generally aware of the footnotes, but few accessed the information routinely and few were aware that the schedule included a table of contraindications and precautions for vaccines routinely recommended for adults. When given scenarios that required careful clinical assessments for vaccination needs in adult patients with more complex medical histories, providers generally did not know how to systematically use the schedule to assist them with decision making.

Based on the results of these interviews, several drafts of the schedule with different layouts and color combinations were developed for usability testing. A survey was then administered to an Internet panel of 251 internal medicine and family medicine physicians comparing the characteristics of the published 2017 schedule and a redesigned draft of it to assess their impressions and preferences. The results indicated that the respondents preferred the color scheme of the published schedule and the simplicity of the redesigned draft schedule. Many respondents requested that a larger font be used. The 2019 schedule thus features a simplified cover page that contains a 3-step instruction on how to use the schedule, new versions of Tables 1 and 2 that use the same colors as previous iterations but with changes for improved cognition, and notes pages with a larger font that became possible with removal of the table of contraindications and pre-
Disclosures: To ensure the integrity of the ACIP, the U.S. Department of Health and Human Services has taken steps to ensure that there is technical adherence to ethics statutes and regulations regarding financial conflicts of interest. Concerns regarding the potential for the appearance of a conflict are addressed, or avoided altogether, through preappointment and postappointment considerations. Individuals with particular vaccine-related interests will not be considered for appointment to the committee. Potential nominees are screened for conflicts of interest and, if any are found, are asked to divest or forgo certain vaccine-related activities. In addition, at the beginning of each ACIP meeting, each member is asked to declare his or her conflicts. Members with conflicts are not permitted to vote if the conflict involves the vaccine or biologic being voted on. Details can be found at www.cdc.gov/vaccines/acip/committee/structure-role.html.

Dr. Kim has nothing to disclose. Dr. Hunter reports travel expenses to ACIP meetings paid by the Centers for Disease Control and Prevention; grants from the Wisconsin Department of Health Services for speaking to clinicians in Milwaukee about adult vaccinations; and board membership in Immunize Milwaukee, an ad hoc, nonincorporated, unfunded community coalition seeking to increase vaccination rates in metro Milwaukee. Disclosures can also be viewed at www.acponline.org/authors/icmje/ConflictOfInterestForms.do?msNum=M18-3600.

References


APPENDIX

Recommendations for routine use of vaccines in children, adolescents, and adults are developed by the Advisory Committee on Immunization Practices (ACIP). ACIP is chartered as a federal advisory committee to provide expert external advice and guidance to the Director of the Centers for Disease Control and Prevention (CDC) on the use of vaccines and related agents to control vaccine-preventable diseases in the civilian population of the United States. Recommendations for routine use of vaccines in children and adolescents are harmonized to the extent possible with recommendations made by the American Academy of Pediatrics (AAP), the American Academy of Family Physicians (AAFP), and the American College of Obstetricians and Gynecologists (ACOG). Recommendations for routine use of vaccines in adults are harmonized with recommendations of AAFP, ACOG, the American College of Physicians (ACP), and the American College of Nurse-Midwives (ACNM). ACIP recommendations adopted by the CDC Director become agency guidelines on the date they are published in the *Morbidity and Mortality Weekly Report* (MMWR). Additional information on ACIP is available at www.cdc.gov/vaccines/acip.

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