Protecting Immunocompromised Patients

- Administer vaccine to eligible patients.
- Immunize close contacts, including
  - Family members
  - Healthcare personnel
  - Others in close contact

Immunizations for Persons at Increased Risk

- People with compromised immune systems, such as those with cancer, are especially vulnerable to illness.
- Vaccination rates tend to be lower in patients with compromised immune systems, in part because of:
  - Health care provider concerns about vaccine safety and effectiveness.
  - Multiple health care providers and encounters.

Vaccination Important for Immunocompromised Patients. 12/05/2013

And It’s Complicated:

- Vaccinating immunocompromised persons requires special considerations because:
  - The balance between risk and benefits is complex.
  - People are immunocompromised in different ways which includes a variety of health conditions.
  - Immune responses may be suboptimal, but vaccination can still reduce morbidity and mortality and prevent treatment delays.
  - ACIP recommendations may differ from the product information.

And Last But Not Least:
- The “stakes” are higher. These patients are at increased risk for disease and complications.
Vaccinology 101

- Live vaccines replicate in the host and generate immune responses that mimic those induced by natural infection.
  - Live vaccines are attenuated, or weakened, in some fashion so that they cause subclinical infection with very little risk of disease.
- Inactivated vaccines may consist of whole, inactivated microbial agents or specific microbial components derived through physical, chemical, or molecular means.
  - Inactivated vaccines cannot replicate.

Vaccine Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Live, attenuated</th>
<th>Inactivated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary immunization</td>
<td>Usually 1 dose</td>
<td>Multiple-dose series usually is needed</td>
</tr>
<tr>
<td>Booster dose</td>
<td>Usually not needed</td>
<td>May be necessary</td>
</tr>
<tr>
<td>Route</td>
<td>Oral, Nasal, Subcutaneous injection</td>
<td>Intramuscular or subcutaneous injection</td>
</tr>
<tr>
<td>Simultaneous administration (on the same day)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Interval between doses of the same vaccine</td>
<td>Minimum intervals apply</td>
<td>Minimum intervals apply</td>
</tr>
<tr>
<td>Interval between doses of different vaccines</td>
<td>Minimum intervals apply</td>
<td>Minimum intervals do not apply</td>
</tr>
</tbody>
</table>

Contraindications and Precautions

- Contraindication
  - A condition that increases the likelihood of a serious adverse reaction to a vaccine for a patient with that condition.
- Precaution
  - A condition in a recipient that might increase the chance or severity of an adverse reaction, or
  - Might compromise the ability of the vaccine to produce immunity.
Permanent Contraindications

- Permanent contraindications to vaccination:
  - Severe allergic reaction to a vaccine component or following a prior dose.
  - Encephalopathy not due to another identifiable cause occurring within 7 days of pertussis vaccination.
  - Severe combined immunodeficiency (rotavirus vaccine).
  - History of intussusception (rotavirus vaccine).

Contraindications, Precautions, Vaccination Types

<table>
<thead>
<tr>
<th>Condition</th>
<th>Live, attenuated</th>
<th>Inactivated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergy to component</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Encephalopathy</td>
<td>—</td>
<td>C</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>C</td>
<td>V*</td>
</tr>
<tr>
<td>Immunosuppression</td>
<td>C</td>
<td>V</td>
</tr>
<tr>
<td>Severe illness</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Recent blood product</td>
<td>P**</td>
<td>V</td>
</tr>
</tbody>
</table>

C = contraindication
P = precaution
V = vaccinate if indicated
*Except HPV
**MMR and varicella-containing (except zoster vaccine) only

Inactivated Vaccines

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diphtheria-,Tetanus- and acellular Pertussis-containing</td>
<td>DTaP, Tdap</td>
</tr>
<tr>
<td>Diphtheria-,Tetanus-containing</td>
<td>Td, DT</td>
</tr>
<tr>
<td>Haemophilus influenza type B</td>
<td>Hib</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>HepA</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>HepB</td>
</tr>
<tr>
<td>Human Papillomavirus</td>
<td>2vHPV, 4vHPV, 9vHPV</td>
</tr>
<tr>
<td>Influenza* (injectable)</td>
<td>IIV3, IIV4, RIV, ccIV3</td>
</tr>
<tr>
<td>Meningococcal (ACWY and B)</td>
<td>MenACWY, MenB*, MPSV4</td>
</tr>
<tr>
<td>Pneumococcal</td>
<td>PCV13, PPSV23</td>
</tr>
</tbody>
</table>

*Abbreviation may be dependent upon brand or product
# Live, Attenuated Vaccines

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herpes zoster (shingles)</td>
<td>HZV</td>
</tr>
<tr>
<td>Influenza (intranasal)</td>
<td>LAIV4</td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>MMR</td>
</tr>
<tr>
<td>Rotavirus*</td>
<td>RV1, RV5</td>
</tr>
<tr>
<td>Varicella (chickenpox)</td>
<td>VAR</td>
</tr>
</tbody>
</table>

*Abbreviation may be dependent on brand

---

## Childhood Vaccines

<table>
<thead>
<tr>
<th>Routine recommended</th>
<th>Recommended for those at increased risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTaP/Tdap/Td</td>
<td>MenB*</td>
</tr>
<tr>
<td>Hib</td>
<td>MenACWY*</td>
</tr>
<tr>
<td>HepA</td>
<td>PPSV23</td>
</tr>
<tr>
<td>HepB</td>
<td></td>
</tr>
<tr>
<td>HPV</td>
<td></td>
</tr>
<tr>
<td>Influenza</td>
<td></td>
</tr>
<tr>
<td>MMR</td>
<td></td>
</tr>
<tr>
<td>MenACWY*</td>
<td></td>
</tr>
<tr>
<td>PCV13*</td>
<td></td>
</tr>
<tr>
<td>Rotavirus</td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td></td>
</tr>
</tbody>
</table>

*Products may be based on age and indications

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## Adult Vaccines

<table>
<thead>
<tr>
<th>Routine recommended</th>
<th>Recommended for those at increased risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>HepA</td>
</tr>
<tr>
<td>Tdap/Td</td>
<td>HepB</td>
</tr>
<tr>
<td>HPV*</td>
<td>HPV*</td>
</tr>
<tr>
<td>PCV13**</td>
<td>PCV13</td>
</tr>
<tr>
<td>PPSV23**</td>
<td>PPSV23</td>
</tr>
<tr>
<td>Zoster*</td>
<td>Meningococcal</td>
</tr>
</tbody>
</table>

*Based on age and gender indications

**Based on age indications
Assessing the Immunization History

- Usually, previously administered doses of vaccines, including childhood doses, “count.”
  - Note: With the exception of the influenza and PPSV23 vaccines, only written documentation should be accepted as evidence of previous vaccination.

- Exceptions:
  - Revaccinate patients who received:
    - Vaccines before HCT.
    - MMR before perinatal HAART (MMR only).
  - Consider revaccinating patients who received vaccines during immunosuppressive therapy or the washout period for therapy.
  - Before acute lymphoblastic leukemia treatment.

Scheduling Vaccines

- Increasing the interval between doses of a multi-dose series does not diminish the effectiveness of the vaccine.
- Decreasing the interval between doses of a multi-dose series may interfere with antibody response and protection.
- If possible, vaccines should be administered before planned immunosuppression, administer:
  - Live, attenuated vaccines: 4 weeks in advance.
  - Inactivated vaccines: 2 weeks in advance.

Administering Vaccines

- Most vaccines can be administered during the same clinical encounter as all other vaccines.
  - Exception: Pneumococcal conjugate and pneumococcal polysaccharide vaccines.
- If live, attenuated injected and intranasal vaccines are not administered at the same visit, they should be separated by at least 4 weeks.
Immunocompromising Conditions

- Immune deficiencies may be congenital or acquired as a result of a medical condition or medication.
- A compromised immune system may be unable to mount a sufficient response to immunization, and the protection afforded by the vaccine may be lessened.
- Nevertheless, vaccines are recommended for immunocompromised persons in the hope that they will gain at least partial immunity.

Vaccination of Persons with Primary Immune Deficiencies

<table>
<thead>
<tr>
<th>Category</th>
<th>Risk-specific Vaccines</th>
<th>Contraindicated Vaccines</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-Lymphocyte: severe (humoral)</td>
<td>PCV13, PPSV23</td>
<td>LAV, MMRV, Tdap, YF, BCG, OPV, Smallpox</td>
<td>The effectiveness of any vaccine is uncertain if it depends on a humoral response</td>
</tr>
<tr>
<td>B-Lymphocyte: less severe antibody deficiencies</td>
<td>PCV13, PPSV23</td>
<td>All live vaccines</td>
<td>All vaccines likely effective; immune response might be attenuated</td>
</tr>
<tr>
<td>T-lymphocyte</td>
<td>PCV13, PPSV23</td>
<td>All live vaccines</td>
<td>Vaccines might be ineffective</td>
</tr>
<tr>
<td>Complement</td>
<td>PCV13, MenACWY</td>
<td>None</td>
<td>All routine vaccines likely effective</td>
</tr>
</tbody>
</table>

Vaccination of Persons with Secondary Immune Deficiencies

<table>
<thead>
<tr>
<th>Category</th>
<th>Risk-specific Vaccines</th>
<th>Contraindicated Vaccines</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignant neoplasm, transplantation, immunosuppressive therapy</td>
<td>PCV13*, PPSV23</td>
<td>All live, attenuated, depending on immune suppression</td>
<td>Effectiveness of any vaccine depends on the degree of immunosuppression</td>
</tr>
</tbody>
</table>

*Adults: If not vaccinated in childhood
Vaccinating Recipients of Hematopoietic Stem Cell Transplants (HCT)

- Antibody titers to VPDs (e.g., tetanus, poliovirus, measles, mumps, rubella, and encapsulated bacteria) decrease 1-4 years after autologous or allogeneic HCT.
- HCT recipients are at increased risk for certain VPDs, including those caused by encapsulated bacteria (i.e., pneumococcal, meningococcal, and Hib).
- HCT recipients should be revaccinated routinely after HCT, regardless of the source of the transplanted stem cells.

Inactivated Vaccines Post-HCT

<table>
<thead>
<tr>
<th>Vaccines</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTaP</td>
<td>Administer 3-dose primary series and a dose of tetanus and diphtheria vaccine every 10 years after.</td>
</tr>
<tr>
<td>HepB</td>
<td>Administer 3-dose series to HBsAG- or HBCAb-positive patients.</td>
</tr>
<tr>
<td>Hib</td>
<td>Administer 3 doses, separated by at least 1 month.</td>
</tr>
<tr>
<td>IIV3 or IIV4</td>
<td>Administer 1 dose and continue to give 1 dose annually each influenza season.</td>
</tr>
<tr>
<td>Pneumococcal</td>
<td>Administer 3 doses of PCV13, beginning 3-6 months after HCT, followed by PPSV23.</td>
</tr>
</tbody>
</table>

Most inactivated vaccines should be initiated 6 months after HCT

Live, Attenuated Vaccination Post-HCT

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMR</td>
<td>Administer 1 dose at least 24 months after transplant</td>
</tr>
<tr>
<td>VAR</td>
<td>Administer 2 doses, separated by at least 1 month, at least 24 months after transplant</td>
</tr>
<tr>
<td>LAIV</td>
<td>Contraindicated</td>
</tr>
<tr>
<td>Zoster</td>
<td>Contraindicated</td>
</tr>
</tbody>
</table>

Assess the immune status prior to vaccination. Serologic testing for measles and varicella is recommended for adults; only vaccinate if the patient is seronegative and immunocompetent.
Vaccine and Immunization Resources

- Questions? E-mail CDC
  - Providers nspinfo@cdc.gov
  - Parents and patients www.cdc.gov/cdcinfo
- CDC website www.cdc.gov/vaccines
- Twitter for health care personnel @CDCIZlearn
- Influenza www.cdc.gov/flu
- Vaccine Safety www.cdc.gov/vaccinesafety
- State Immunization Programs www.cdc.gov/vaccines/imz-managers/awardee-imz-websites.html

Airborne Transmission

- Airborne droplet nuclei or small particles in the 0.5 microns size containing germs that remain infective over time and distance.

  - May be carried on air currents into several rooms and inhaled by susceptible individuals face to face contact

Airborne Transmission

- Inpatients
  - Room with special air handling and ventilation systems (e.g., Airborne Infection Isolation rooms (AIIR)) to contain and then safely remove the infectious agent.
  - Healthcare workers should wear a NIOSH certified N95 or higher level respirator.
- Outpatients
  - Masked (procedure or surgical) to contain these particles, until they can be transferred to an AIIR or discharged to home isolation
Airborne Transmissible Diseases

- Examples of Airborne transmissible diseases healthcare workers may encounter while caring for oncology patients
  - Mycobacterium tuberculosis
  - rubeola virus (measles)
  - varicella-zoster virus (chickenpox)
- **Patients presenting with a fever and a rash should always be placed on Airborne precautions**

Droplet Transmission

- Respiratory droplets travel directly from the respiratory tract of the infectious individual to the nose, conjunctivae, and less frequently the mouth, of susceptible persons.
- These droplets do not carry over long distances
  - Wise to wear a mask when within 6 feet of the patient
  - Important to wear a mask upon entry into the patient’s room

Droplet Transmission

- Inpatients
  - Placed in a private room
  - Pulling the privacy curtains can provide protection until placed in a private room
- Outpatients
  - Mask (procedure or surgical) to contain the droplets, until they can be appropriately placed (e.g. admitted to a private room or discharged to home isolation)
- When possible, physically separate symptomatic patients at least 6 feet from others.
**Droplet Transmissible Diseases**

- Examples of Droplet transmissible diseases healthcare workers may encounter while caring for oncology patients.
  - Bordetella pertussis (whooping cough)
  - influenza
  - adenovirus
  - rhinovirus
  - Neisseria meningitidis

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**Exposure Event Steps**

- Confirm
- Notify Infection Prevention/OCC Health/Leadership
- Define who would be at risk
- Identify who is at risk
- Screen
- Provide Prophylaxis and/or Furlong as required

---

**Post Exposure**

- Vaccine preventable diseases have different incubation periods.
- Staff should work closely with infection prevention and employee health when assessing exposure risk and need for prophylaxis.
- Many Vaccine preventable illnesses also require Public Health notification.
  - Healthcare workers should be familiar with their local jurisdiction’s requirements.
Questions?

- aflood@coh.org
- 626 256 4673 x 62119
### Screening Checklist for Contraindications to Vaccines for Adults

For patients: The following questions will help us determine which vaccines you may be given today. If you answer “yes” to any question, it does not necessarily mean you should not be vaccinated. It just means additional questions must be asked. If a question is not clear, please ask your health care provider to explain it.

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are you sick today?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Do you have allergies to medications, food, a vaccine component, or latex?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Have you ever had a serious reaction after receiving a vaccination?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Do you have a long-term health problem with heart disease, lung disease, asthma, kidney disease, metabolic disease (e.g., diabetes), anemia, or other blood disorder?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Do you have cancer, leukemia, HIV/AIDS, or any other immune system problem?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. In the past 3 months, have you taken medications that affect your immune system, such as prednisone, other steroids, or anticancer drugs; drugs for the treatment of rheumatoid arthritis, Crohn’s disease, or psoriasis; or have you had radiation treatments?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Have you had a seizure or a brain or other nervous system problem?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. During the past year, have you received a transfusion of blood or blood products, or been given immune (gamma) globulin or an antiviral drug?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. For women: Are you pregnant or is there a chance you could become pregnant during the next month?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Have you received any vaccinations in the past 4 weeks?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Did you bring your immunization record card with you?**

- **Yes [ ]**
- **No [ ]**

It is important for you to have a personal record of your vaccinations. If you don’t have a personal record, ask your health care provider to give you one. Keep this record in a safe place and bring it with you every time you seek medical care. Make sure your health care provider records all your vaccinations on it.

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*Technical content reviewed by the Centers for Disease Control and Prevention*

**Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org**

www.immunize.org/catg.d/p4065.pdf • Item #P4065 (9/15)
1. Are you sick today? [all vaccines]
   There is no evidence that acute illness reduces vaccine efficacy or increases
   vaccine adverse events (1). However, as a precaution with moderate or
   severe acute illness, all vaccines should be delayed until the illness has
   improved. Mild illnesses (such as upper respiratory infections or diarrheaa)
   are NOT contraindications to vaccination. Do not withhold vaccination
   if a person is taking antibiotics.

2. Do you have allergies to medications, food, a vaccine component, or latex? [all vaccines]
   If a person has anaphylaxis after eating gelatin, do not administer MMR,
   varicella, standard trivalent Fluzone, Flumist, rabies (Rabavert), oral
   typhoid, or yellow fever vaccine. A local reaction to a prior vaccine dose
   or vaccine components (e.g., latex) is not a contraindication to a subse-
   quent dose or vaccine containing that component. For a table of vaccines
   supplied in vials or syringes that contain latex, go to www.cdc.gov/
   For an extensive list of vaccine components, see reference 2.
   An egg-free recombinant influenza vaccine (RIV3) may be used in people
   age 18 years and older with egg allergy of any severity who have no other
   contraindications. People younger than age 18 years who have experienced
   a serious systemic or anaphylactic reaction (e.g., hives, swelling of the
   lips or tongue, acute respiratory distress, or collapse) after eating eggs
   can usually be vaccinated with inactivated influenza vaccine (IIV); consult
   ACIP recommendations (see reference 3).

3. Have you ever had a serious reaction after receiving a vaccination? [all vaccines]
   History of anaphylactic reaction (see question 2) to a previous dose of
   vaccine or vaccine component is a contraindication for subsequent doses
   (1). Under normal circumstances, vaccines are deferred when a precaution
   is present. However, situations may arise when the benefit outweighs the
   risk (e.g., during a community pertussis outbreak).

4. Do you have a long-term health problem with heart disease, lung disease, asthma, kidney disease, metabolic disease (e.g., diabetes), anemia, or other blood disorder? [LAIV]
   The safety of intranasal live attenuated influenza vaccine (LAIV) in people
   with these conditions has not been established. These conditions, including
   asthma in adults, should be considered precautions for the use of LAIV.

5. Do you have cancer, leukemia, HIV/AIDS, or any other immune system problem? [LAIV, MMR, VAR, ZOS]
   Live virus vaccines (e.g., LAIV, measles-mumps-rubella [MMR], varicella
   [VAR], zoster [ZOS]) are usually contraindicated in immunocompromised
   people. However, there are exceptions. For example, MMR vaccine is
   recommended and varicella vaccine should be considered for adults with
   CD4+ T-lymphocyte counts of greater than or equal to 200 cells/μL.
   Immunosuppressed people should not receive LAIV. For details, consult
   the ACIP recommendations (3, 4, 5).

6. In the past 3 months, have you taken medications that affect your immune system, such as cortisone, prednisone, other steroids, or anticancer drugs; drugs for the treatment of rheumatoid arthritis, Crohn’s disease, or psoriasis; or have you had radiation treatments? [LAIV, MMR, VAR, ZOS]
   Live virus vaccines (e.g., LAIV, MMR, VAR, ZOS) should be postponed
   until after chemotherapy or long-term high-dose steroid therapy has
   ended. For details and length of time to postpone, consult the ACIP
   statement (1, 3). Some immune mediator and immune modulator drugs
   (especially the antitumor-necrosis factor agents adalimumab, infliximab,
   and etanercept) may be immunosuppressive. The use of live vaccines
   should be avoided in persons taking these drugs (MMWR 2011;60
   [RR2:23]. To find specific vaccination schedules for stem cell transplant
   (bone marrow transplant) patients, see reference 6. LAIV can be given
   only to healthy non-pregnant people ages 2 through 49 years.

7. Have you had a seizure or a brain or other nervous system problem? [influenza, Td/Tdap]
   Tdap is contraindicated in people who have a history of encephalopathy
   within 7 days following DTP/DTaP given before age 7 years. An unstable
   progressive neurologic problem is a precaution to the use of Tdap.
   For people with stable neurologic disorders (including seizures) unrelated
   to vaccination, or for people with a family history of seizure, vaccinate
   as usual. A history of Guillain-Barré syndrome (GBS) in a consideration
   with the following: 1) Td/Tdap: if GBS has occurred within 6 weeks of a
   tetanus-containing vaccine and decision is made to continue vaccination,
   give Tdap instead of Td if no history of prior Tdap; 2) Influenza vaccine
   (IIV/LAIV): if GBS has occurred within 6 weeks of a prior influenza vaccine,
   vaccinate with IIV at high risk for severe influenza complications.

8. During the past year, have you received a transfusion of blood or blood products, or been given immune (gamma) globulin or an antiviral drug? [LAIV, MMR, VAR, ZOS]
   Certain live virus vaccines (e.g., LAIV, MMR, VAR, ZOS) may need to be
   deferred, depending on several variables. Consult the most current ACIP
   recommendations for current information on products between antiviral
   drugs, immune globulin or blood product administration and live virus
   vaccines. (1)

9. For women: Are you pregnant or is there a chance you could become pregnant during the next month? [MMR, LAIV, VAR, ZOS]
   Live virus vaccines (e.g., MMR, VAR, ZOS, LAIV) are contraindicated one
   month before and during pregnancy because of the theoretical risk of virus
   transmission to the fetus. Sexually active women in their childbearing years
   who receive live virus vaccines should be instructed to practice careful
   contraception for one month following receipt of the vaccine. On theoretical
   grounds, inactivated poliovirus vaccine should not be given during preg-
   nancy; however, it may be given if risk of exposure is imminent and
   immediate protection is needed (e.g., travel to endemic areas). Inactivated
   influenza vaccine and Tdap are both recommended during pregnancy.
   Both vaccines may be given at any time during pregnancy but the preferred
   time for Tdap administration is at 27–36 weeks’ gestation.

10. Have you received any vaccinations in the past 4 weeks? [LAIV, MMR, VAR, yellow fever]
    People who were given either LAIV or an injectable live virus vaccine
    (e.g., MMR, VAR, ZOS, yellow fever) should wait 28 days before receiving
    another vaccination of this type. Inactivated vaccines may be given at any
    spacing interval if they are not administered simultaneously.

REFERENCES
1. CDC. General recommendations on immunization, at www.cdc.gov/mmwr/pdf/rll
   r6002.pdf.
2. Table of Vaccine Components: www.cdc.gov/vaccines/pubs/pinkbook/downloads/
   appendices/b/excipient-table-2.pdf.
3. CDC. Prevention and control of influenza with vaccines: Recommendations of the
   Advisory Committee on Immunization Practices (ACIP). United States, 2015–16
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   measles, rubella, and congenital rubella syndrome and control of mumps. MMWR
   1998; 47 (RR-8).
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   nization Practices. MMWR 2007; 56 (RR-4).
   hematopoietic stem cell transplant recipients: a global perspective. Biol Blood Marrow
7. CDC. Notice to readers: Revised ACIP recommendation for avoiding pregnancy after
   receiving a rubella-containing vaccine. MMWR 2001; 50 (49).
8. CDC. Prevention of pertussis, tetanus, and diphtheria among pregnant and postpartum
   women and their infants: Recommendations of the ACIP. MMWR 2008; 57 (RR-4).

Immunization Action Coalition • Saint Paul, Minnesota • 651-647-9009 • www.immunize.org • www.vaccineinformation.org

www.immunize.org/catg/p4065.pdf • Item #P4065 – page 2 (9/15)
Screening Checklist for Contraindications to Vaccines for Children and Teens

For parents/guardians: The following questions will help us determine which vaccines your child may be given today. If you answer “yes” to any question, it does not necessarily mean your child should not be vaccinated. It just means additional questions must be asked. If a question is not clear, please ask your health care provider to explain it.

<table>
<thead>
<tr>
<th>Question</th>
<th>yes</th>
<th>no</th>
<th>don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is the child sick today?</td>
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<tr>
<td>2. Does the child have allergies to medications, food, a vaccine component, or latex?</td>
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<tr>
<td>3. Has the child had a serious reaction to a vaccine in the past?</td>
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<tr>
<td>4. Has the child had a health problem with lung, heart, kidney or metabolic disease (e.g., diabetes), asthma, or a blood disorder? Is he/she on long-term aspirin therapy?</td>
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<tr>
<td>5. If the child to be vaccinated is 2 through 4 years of age, has a health care provider told you that the child had wheezing or asthma in the past 12 months?</td>
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<tr>
<td>6. If your child is a baby, have you ever been told he or she has had intussusception?</td>
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<tr>
<td>7. Has the child, a sibling, or a parent had a seizure; has the child had brain or other nervous system problems?</td>
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<tr>
<td>8. Does the child have cancer, leukemia, HIV/AIDS, or any other immune system problem?</td>
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<tr>
<td>9. In the past 1–3 months, has the child taken medications that affect the immune system such as prednisone, other steroids, or anticancer drugs; drugs for the treatment of rheumatoid arthritis, Crohn’s disease, or psoriasis; or had radiation treatments?</td>
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<tr>
<td>10. In the past year, has the child received a transfusion of blood or blood products, or been given immune (gamma) globulin or an antiviral drug?</td>
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<tr>
<td>11. Is the child/teen pregnant or is there a chance she could become pregnant during the next month?</td>
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<tr>
<td>12. Has the child received vaccinations in the past 4 weeks?</td>
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</tbody>
</table>

Did you bring your immunization record card with you? yes □ no □

It is important to have a personal record of your child’s vaccinations. If you don’t have one, ask the child’s health care provider to give you one with all your child’s vaccinations on it. Keep it in a safe place and bring it with you every time you seek medical care for your child. Your child will need this document to enter day care or school, for employment, or for international travel.
Information for Health Care Professionals about the Screening Checklist for Contraindications (Children and Teens)

Are you interested in knowing why we included a certain question on the screening checklist? If so, read the information below. If you want to find out even more, consult the references listed at the end.

1. Is the child sick today? [all vaccines]
   There is no evidence that acute illness reduces vaccine efficacy or increases vaccine adverse events (1). However, as a precaution with moderate or severe acute illness, all vaccines should be delayed until the illness has improved. Mild illnesses (such as otitis media, upper respiratory infections, and diarrhea) are NOT contraindications to vaccination. Do not withhold vaccination if a person is taking antibiotics.

2. Does the child have allergies to medications, food, a vaccine component, or latex? [all vaccines]
   If a person has anaphylaxis after eating gelatin, do not administer MMR, MMRV, or varicella vaccine. A local reaction following a prior vaccine dose is not a contraindication to a subsequent dose. For a table of vaccines supplied in vials or syringes that contain gelatin, see Table of Vaccine Components. [www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendixB/Blateatable.pdf]. For an extensive list of vaccine components, see reference 3. An egg-free recombinant influenza vaccine (RIV) may be used in people age 18 years and older who have a history of anaphylaxis to egg. People who have no other contraindications to vaccination and are younger than 18 years who have experienced a serious systemic or anaphylactic reaction (e.g., hives, swelling of the lips or tongue, acute respiratory distress, or collapse) after eating eggs can usually be vaccinated with inactivated influenza vaccine (IIV); consult ACIP recommendations (see reference 4).

3. Has the child had a serious reaction to a vaccine in the past? [all vaccines]
   History of anaphylactic reaction (see question 2) to a previous dose of vaccine or vaccine component is a contraindication for subsequent doses (1). History of encephalopathy within 7 days following DTP/DTaP is a contraindication for further doses of pertussis-containing vaccine. Precautions to DTaP (not IAPD) include the following: (a) seizure within 3 days of a dose, (b) pale or limp episode or collapse within 48 hours of a dose, (c) continuous crying for 3 or more hours within 48 hours of a dose, and (d) fever of 105°F (40°C) within 48 hours of a previous dose. There are other adverse events that might have occurred following vaccination that constitute contraindications or precautions to future doses under normal circumstances when the benefit outweighs the risk (e.g., during a community pertussis outbreak).

4. Has the child had a health problem with lung, heart, kidney, or metabolic disease (e.g., diabetes), asthma, or a blood disorder? Is he/she on long-term aspirin therapy? [LAIV]
   The safety of LAIV in children and teens with lung, heart, kidney, or metabolic disease (e.g., diabetes), or a blood disorder has not been established. These conditions, including asthma in children ages 5 years and older, should be considered precautions to the use of LAIV. Children on long-term aspirin therapy should not be given LAIV; instead, they should be given IIV.

5. If the child to be vaccinated is 2 through 4 years of age, has a health care provider told you that the child had wheezing or asthma in the past 12 months? [LAIV]
   Children ages 2 through 4 years who have had a wheezing episode within the past 12 months should not be given LAIV. Instead, these children should be given IIV.

6. If your child is a baby, have you ever been told that he or she has intussusception? [Rotavirus]
   Infants who have a history of intussusception (i.e., the telescoping of one portion of the intestine into another) should not be given rotavirus vaccine.

7. Has the child, a sibling, or a parent had a seizure; has the child had brain or other nervous system problem? [DTaP, Td, Tdap, IIV, LAIV, MMR, MMRV]
   DTaP and Tdap are contraindicated in children who have a history of encephalopathy within 7 days following DTP/DTaP. An unstable progressive neurologic disorder (including seizures) unrelated to vaccination, or for children with a family history of seizures, vaccine is usually not contraindicated. However, there are exceptions. For example, MMR is recommended for asymptomatic HIV-infected children who do not have evidence of severe immunosuppression. Likewise, varicella vaccine should be considered for HIV-infected children with age-specific CD4+ T-lymphocyte percentage at 15% or greater and may be considered for children age 8 years and older with CD4+ T-lymphocyte counts of greater than or equal to 200 cells/µL. Immunosuppressed children should not receive LAIV. Infants who have been diagnosed with severe combined immunodeficiency (SCID) should not be given a live virus vaccine, including rotavirus (RV) vaccine. Other forms of immunosuppression are a precaution, not a contraindication, to rotavirus vaccine. For details, consult the ACIP recommendations (1, 5, 6).

8. Does the child have cancer, leukemia, HIV/AIDS, or any other immune system problem? [LAIV, MMR, MMRV, RV, VAR]
   Live virus vaccines (e.g., MMR, MMRV, varicella, rotavirus, and the intranasal live, attenuated influenza vaccine [IIV]) are usually contraindicated in immunocompromised children. However, there are exceptions. For example, MMR is recommended for asymptomatic HIV-infected children who do not have evidence of severe immunosuppression. Likewise, varicella vaccine should be considered for HIV-infected children with age-specific CD4+ T-lymphocyte percentage at 15% or greater and may be considered for children age 8 years and older with CD4+ T-lymphocyte counts of greater than or equal to 200 cells/µL. Immunosuppressed children should not receive LAIV. Infants who have been diagnosed with severe combined immunodeficiency (SCID) should not be given a live virus vaccine, including rotavirus (RV) vaccine. Other forms of immunosuppression are a precaution, not a contraindication, to rotavirus vaccine. For details, consult the ACIP recommendations (1, 5, 6).

9. In the past 1-3 months, has the child taken medications that affect the immune system such as prednisone, other steroids, or anticancer drugs; drugs for the treatment of rheumatoid arthritis, Crohn’s disease, or psoriatic or had radiation treatment? [LAIV, MMR, MMRV, VAR]
   Live virus vaccines (e.g., LAIV, MMR, MMRV, VAR) should be postponed until after chemotherapy or long-term high-dose steroid therapy has ended. For details and length of time to postpone, consult the ACIP statement (1). Some immune modulator and immune modulator drugs (especially the antitumor-necrosis factor agents adalimumab, infliximab, and etanercept) may be immunosuppressive. The use of live vaccines should be avoided in persons taking these drugs (MMWR 2011;60(RR-23). To find specific vaccination schedules for stem cell transplant (bone marrow transplant) patients, see reference 7. LAIV can be given only to healthy non-pregnant people ages 2 through 49 years.

10. In the past year, has the child received a transfusion of blood or blood products, or been given immune (gamma globulin or an antiviral drug) [LAIV, MMR, MMRV, VAR]
   Certain live virus vaccines (e.g., LAIV, MMR, MMRV, varicella) may need to be deferred, depending on several variables. Consult the most current ACIP recommendations or the current Red Book for the most current information on intervals between antiviral drugs, immune globulin or blood product administration and live virus vaccines (1, 2).

11. Is the child/teen pregnant or is there a chance she could become pregnant during the next month? [LAIV, MMR, MMRV, VAR]
   Live virus vaccines (e.g., MMR, MMRV, varicella, LAIV) are contraindicated one month before and during pregnancy because of the theoretical risk of viral transmission to the fetus (1, 2). Sexually active young women who receive a live virus vaccine should be instructed to practice careful contraception for one month following receipt of the vaccine (6, 8). On theoretical grounds, inactivated poliovirus vaccine should not be given during pregnancy; however, it may be given if risk of exposure is imminent (e.g., travel to endemic areas) and immediate protection is needed. Use of Td or Tdap is not contraindicated in pregnancy. At the provider’s discretion, either vaccine may be administered during the 2nd or 3rd trimester (9).

12. Has the child received vaccinations in the past 4 weeks? [LAIV, MMR, MMRV, VAR, yellow fever]
   Children who were given either LAIV or an inactivated live virus vaccine (e.g., MMR, MMRV, varicella, yellow fever) should wait 28 days before receiving another vaccination of this type. Inactivated vaccines may be given at the same time or at any spanning interval.

REFERENCES
8. CDC. Notice to readers: Revised ACIP recommendation for avoiding pregnancy after receiving a rubella-containing vaccine. MMWR 2001; 50 (49).
## Guide to Contraindications and Precautions to Commonly Used Vaccines

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Contraindications</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B (HepB)</td>
<td>• Severe allergic 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>
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<tr>
<td></td>
<td></td>
<td>• Infant weighing less than 2000 grams (4 lbs, 6.4 oz)</td>
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<tr>
<td>Rotavirus (RV5 [RotaTeq], RV1 [Rotarix])</td>
<td>• Severe allergic 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>
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<td></td>
<td>• Severe combined immunodeficiency (SCID)</td>
<td>• Altered immunocompetence other than SCID</td>
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<tr>
<td></td>
<td>• History of intussusception</td>
<td>• Chronic gastrointestinal disease</td>
</tr>
<tr>
<td>Diphtheria, tetanus, pertussis (DTaP)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Spina bifida or bladder exstrophy</td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Tdap)</td>
<td>• For pertussis-containing vaccines: encephalopathy (e.g., coma, decreased level of consciousness, prolonged seizures) not attributable to another identifiable cause within 7 days of administration of a previous dose of DTP or DTaP (for DTaP); or of previous dose of DTP, DTaP, or Tdap (for Tdap)</td>
<td>• Moderate or severe acute illness with or without fever</td>
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<td>• Guillain-Barré syndrome (GBS) within 6 weeks after a previous dose of tetanus toxoid-containing vaccine</td>
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<td>• History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccine; defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine</td>
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<tr>
<td></td>
<td></td>
<td>• For pertussis-containing vaccines: progressive or unstable neurologic disorder (including infantile spasms for DTaP), uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized</td>
</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)</td>
<td>• Severe allergic 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>
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<td></td>
<td>• Age younger than 6 weeks</td>
<td>• Temperature of 105° F or higher (40.5° C or higher) within 48 hours after vaccination with a previous dose of DTP/DTaP</td>
</tr>
<tr>
<td>Inactivated poliovirus vaccine (IPV)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Collapse or shock-like state (i.e., hypotonic hyporesponsive episode) within 48 hours after receiving a previous dose of DTP/DTaP</td>
</tr>
<tr>
<td>Pneumococcal (PCV13 or PPSV23)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component (including, for PCV13, to any diphtheria toxoid-containing vaccine)</td>
<td>• Seizure within 3 days after receiving a previous dose of DTP/DTaP</td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>• Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>• Persistent, inconsolable crying lasting 3 or more hours within 48 hours after receiving a previous dose of DTP/DTaP</td>
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<tr>
<td></td>
<td>• Known severe immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, or long-term immunosuppressive therapy or patients with human immunodeficiency virus [HIV] infection who are severely immunocompromised)</td>
<td>space</td>
</tr>
<tr>
<td>Varicella (Var)</td>
<td>• Severe allergic 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>
<tr>
<td></td>
<td>• Known severe immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, congenital immunodeficiency, or long-term immunosuppressive therapy or patients with HIV infection who are severely immunocompromised)</td>
<td>• Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)</td>
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<tr>
<td></td>
<td>• History of thrombocytopenia or thrombocytopenic purpura</td>
<td>• Need for tuberculin skin testing</td>
</tr>
<tr>
<td>Hepatitis A (HepA)</td>
<td>• Severe allergic 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>
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</tbody>
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(continued on page 2)
# Guide to Contraindications and Precautions to Commonly Used Vaccines

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Contraindications</th>
<th>Precautions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Influenza, inactivated injectable (IIV)</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
<td>- Severe allergic reaction (e.g., anaphylaxis) after a previous dose of any influenza vaccine or to a vaccine component, including egg protein</td>
<td>- Moderate or severe acute illness with or without fever &lt;br&gt; - History of GBS within 6 weeks of previous influenza vaccination &lt;br&gt; - Persons who experience only hives with exposure to eggs may receive RIV or, with additional safety precautions, IIV&lt;sup&gt;9&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Influenza, recombinant (RIV)</strong>&lt;sup&gt;5&lt;/sup&gt;</td>
<td>- Severe allergic reaction (e.g., anaphylaxis) after a previous dose of RIV or to a vaccine component. RIV does not contain any egg protein.&lt;sup&gt;5&lt;/sup&gt;</td>
<td>- Moderate or severe acute illness with or without fever &lt;br&gt; - History of GBS within 6 weeks of previous influenza vaccination</td>
</tr>
<tr>
<td><strong>Influenza, live attenuated (LAIV)</strong>&lt;sup&gt;4,9&lt;/sup&gt;</td>
<td>- People younger than age 2 years or older than age 49 years. &lt;br&gt; - Severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine, or to a previous dose of any influenza vaccine &lt;br&gt; - Concomitant use of aspirin or aspirin-containing medication in children or adolescents through age 17 years. &lt;br&gt; - In addition, ACIP recommends that LAIV not be used in the following populations: pregnant women; immunosuppressed people; people with egg allergy of any severity; children ages 2 through 4 years who have asthma or had wheezing within the past 12 months, per healthcare provider statement; people who have taken influenza antiviral medications (amantadine, rimantadine, zanamivir, or oseltamivir) within the previous 48 hours; avoid use of these antiviral drugs for 14 days after vaccination</td>
<td>- Moderate or severe acute illness with or without fever &lt;br&gt; - History of GBS within 6 weeks of previous influenza vaccination &lt;br&gt; - Asthma in persons age 5 years and older &lt;br&gt; - Other chronic medical conditions (e.g., other chronic lung diseases, chronic cardiovascular disease [excluding isolated hypertension], diabetes, chronic renal or hepatic disease, hematologic disease, neurologic disease, and metabolic disorders)</td>
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<tr>
<td><strong>Human papillomavirus (HPV)</strong>&lt;sup&gt;8&lt;/sup&gt;</td>
<td>- Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component</td>
<td>- Moderate or severe acute illness with or without fever &lt;br&gt; - Pregnancy</td>
</tr>
<tr>
<td><strong>Meningococcal: conjugate (MenACWY), polysaccharide (MPSV4)</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td>- Severe allergic 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>
<tr>
<td><strong>Zoster (HZV)</strong>&lt;sup&gt;6&lt;/sup&gt;</td>
<td>- Severe allergic reaction (e.g., anaphylaxis) to a vaccine component &lt;br&gt; - Known severe cellular immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, or long-term immunosuppressive therapy&lt;sup&gt;9&lt;/sup&gt; or patients with HIV infection who are severely immunocompromised). &lt;br&gt; - Pregnancy</td>
<td>- Moderate or severe acute illness with or without fever &lt;br&gt; - Receipt of specific antivirals (i.e., acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination; avoid use of these antiviral drugs for 14 days after vaccination</td>
</tr>
</tbody>
</table>

## Footnotes

1. Vaccine package inserts and the full ACIP recommendations for these vaccines should be consulted for additional information on vaccine-related contraindications and precautions and for more information on vaccine recipients. Events or conditions listed as precautions should be reviewed carefully. Benefits and risks for administering a specific vaccine to a person under these circumstances should be considered. If the risk from the vaccine is believed to outweigh the benefit, the vaccine should not be administered. If the benefit of vaccination is believed to outweigh the risk, the vaccine should be administered. A contraindication increases the chance of a serious adverse reaction. Therefore, a vaccine should not be administered when a contraindication is present. Whether and when to administer DTPa to children with proven or suspected underlying neurologic disorders should be decided on a case-by-case basis.

2. Hepatitis B vaccination should be deferred for preterm infants and infants weighing less than 2000 g if the mother is documented to be hepatitis B surface antigen (HBsAg)-negative at the time of the infant’s birth. Vaccination can commence at chronological-age 1 month or at hospital discharge. For infants born to women who are HBsAg-positive, hepatitis B immunoglobulin and hepatitis B vaccine should be administered within 12 hours of birth, regardless of weight.


4. LAIV, MMR, varicella, or zoster vaccines can be administered on the same day. If not administered on the same day, the live vaccines should be separated by at least 28 days.

5. Immunosuppressive steroid dose is considered to be 2 or more weeks of daily receipt of 20 mg prednisone or equivalent. Vaccination should be deferred for at least 1 month after discontinuation of such 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.


7. Vaccine should be deferred for the appropriate interval if replacement immune globulin products are being administered (see “Table 5. Recommended Intervals Between Administration of Antibody-Containing Products and Measles-Varicella-Containing Vaccine, by Product and Indication for Vaccination” found in “General Recommendations on Immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP)” MMWR 2011;60(No. RR-2) available at www.cdc.gov/vaccines/hcp/acip-recs/index.html.).

8. Measles vaccination might suppress tuberculin reactivity temporarily. Measles-containing vaccine may be administered on the same day as tuberculin skin testing. If testing cannot be performed until after the day of MMR vaccination, the test should be postponed for at least 4 weeks after the vaccination. If an urgent need exists to skin test, do so with the understanding that reactivity might be reduced by the vaccine.

9. For more information on use of influenza vaccines among persons with egg allergies and a complete list of conditions that CDC considers to be reasons to avoid getting LAIV, see CDC. “Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP) – United States, 2014–15” MMWR 2014;63(10):681–97.


Regarding latex allergy, consult the package insert for any vaccine administered.
CDC IMMUNIZATION RESOURCES for You & Your PATIENTS

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

June 2015
CS249275-B
FREE CONTINUING EDUCATION

Did you know you can get free Continuing Education for participating in CDC’s immunization education programs?

www.cdc.gov/vaccines/ed/courses.htm
**Immunization Guidelines and Recommendations**

**Immunization Schedules:** The schedules of recommended vaccinations for all age groups are offered in several printable versions as well as an interactive tool and as a downloadable application for smartphone.  
www.cdc.gov/vaccines/schedules/hcp/

**Vaccine administration:** Guidelines, screening questions and checklists for your patients, reference tables on contraindications and precautions, and comforting technique tools are available.  
www.cdc.gov/vaccines/recs/vac-admin/

**Vaccine storage and handling:** Explore storage and handling videos, toolkits, and fact sheets to ensure your practice is storing and handling vaccines in accordance with ACIP recommendations.  
www.cdc.gov/vaccines/recs/storage/

**Vaccine Information Statements (VIS):** Federal law requires you provide VIS to patients before administering certain vaccines; VIS explains both the vaccine benefits and risks to your patients. You can find print-ready VIS at: www.cdc.gov/vaccines/hcp/vis/. You can find VIS translated into more than 40 languages on Immunization Action Coalition’s website: www.immunize.org/vis/

**Vaccine Adverse Event Reporting System (VAERS):** The National Childhood Vaccine Injury Act (NCVIA) requires you to report certain adverse events that occur following vaccination. VAERS is a system for reporting those adverse events, as well as for analyzing data from those reports and making it available to the public.  
vaers.hhs.gov/
Epidemiology and Prevention of Vaccine-Preventable Diseases (Pink Book): The Pink Book offers the most comprehensive information on vaccine-preventable diseases and recommendations for vaccine use. 
www.cdc.gov/vaccines/pubs/pinkbook/index.html

You can order a hard copy of the book from Public Health Foundation. 
bookstore.phf.org/store/ProductDetails.aspx?productId=27876

CDC Travel Vaccines: Visit CDC’s travel vaccine web page to find out which vaccines your patients may need when traveling outside the United States. 
wwwnc.cdc.gov/travel/destinations/list

You Call the Shots: You Call the Shots is a series of modules designed to provide training on vaccine recommendations, links to resource materials, and self-tests to assess learning. 
www.cdc.gov/vaccines/ed/youcalltheshots.htm
The Immunization Encounter: Critical Issues:
This online course addresses issues related to a routine immunization clinic encounter, vaccine administration, vaccine management and documentation, vaccine adverse event management and reporting, and resources for staff orientation and development.
www.cdc.gov/vaccines/ed/encounter/

Keys to Storing and Handling Your Vaccine Supply:
This video is designed to decrease vaccine storage and handling errors and preserve your vaccine supply by demonstrating recommended best practices for storage and handling of vaccines.
www2.cdc.gov/vaccines/ed/shvideo/

HPV YOU ARE THE KEY TO CANCER PREVENTION This presentation provides up-to-date information on HPV infection/disease, HPV vaccine, and ways to successfully communicate with patients and their parents about HPV vaccination. www.cdc.gov/vaccines/ed/hpv/
Resources for Healthcare Professionals

Vaccines for Children (VFC): A federally funded program that provides vaccines at no cost to children who might not otherwise be vaccinated because of inability to pay. Visit CDC’s VFC program web page to learn how to become a VFC provider. [www.cdc.gov/vaccines/programs/vfc/index.html](http://www.cdc.gov/vaccines/programs/vfc/index.html)


Influenza resources: CDC offers a wealth of influenza vaccination information and resources at [www.cdc.gov/flu](http://www.cdc.gov/flu) for patients, parents, and you.

Pertussis resources: Pertussis vaccines are recommended for people of all ages. CDC has a variety of pertussis vaccination resources available. [www.cdc.gov/pertussis](http://www.cdc.gov/pertussis)
Resources for Parents

**CDC Vaccine Website for Parents:** This website provides parents with credible, balanced information about the risks and benefits of vaccination for their children.

[www.cdc.gov/vaccines/parents/](http://www.cdc.gov/vaccines/parents/)

**Fact sheets about vaccine preventable diseases:**
Parents are often unfamiliar with complications associated with vaccine-preventable diseases. CDC has free parent-friendly fact sheets about each vaccine-preventable disease and the vaccine that prevents it, which you can print from your office (in English and Spanish).


**Vaccine safety:** You can send parents to the CDC Vaccine Safety web page to learn about vaccine safety basics, and how vaccines are monitored.

[www.cdc.gov/vaccinesafety/](http://www.cdc.gov/vaccinesafety/)
Resources for Healthcare Professionals

Information about adolescent vaccines:
You will find fact sheets on specific adolescent vaccines, a video on how to increase vaccination coverage in your practice, and trainings. [www.cdc.gov/vaccines/who/teens/for-hcp.html](http://www.cdc.gov/vaccines/who/teens/for-hcp.html)

HPV vaccine resources: To help improve HPV vaccination coverage rates, CDC has compiled ready-to-use tools and resources for your practice to successfully communicate with parents about HPV vaccination. [www.cdc.gov/vaccines/who/teens/for-hcp/hpv-resources.html](http://www.cdc.gov/vaccines/who/teens/for-hcp/hpv-resources.html)

Influenza resources: CDC offers a wealth of influenza vaccination information and resources at [www.cdc.gov/flu/](http://www.cdc.gov/flu/) for patients, parents, and healthcare professionals.

Pertussis resources: Pertussis vaccines are recommended for people of all ages. CDC has a variety of pertussis vaccination resources available. [www.cdc.gov/pertussis](http://www.cdc.gov/pertussis)
Resources for Parents and Patients

Adolescent vaccines (patients): This web page provides your patients with tips for preparing for vaccination and what to do after receiving the vaccine. Patients will be able to find fact sheets written for them, based on their age group. www.cdc.gov/vaccines/who/teens/for-preteens-teens.html

Adolescent vaccines (parents): This web page provides your patients’ parents information on why it is important to vaccinate according to the immunization schedule, as well as information on the specific vaccines their children need, school vaccination requirements, and information on paying for vaccines. www.cdc.gov/vaccines/who/teens/for-parents.html

What Vaccines do You need?

Vaccine quiz for adolescents and adults: This web-based, interactive quiz helps adolescents and adults find out which vaccines they may need. www2.cdc.gov/nip/adultimmsched/

Vaccine safety: You can send parents to the CDC Vaccine Safety web page to learn about vaccine safety basics, and how vaccines are monitored. www.cdc.gov/vaccinesafety/
Adult vaccination resources for provider practices: Find information on evidence-based strategies, resources, and tools to help improve adult immunization in your practice. You will also find resources for insurance and payment issues. [www.cdc.gov/vaccines/hcp/patient-ed/adults/for-practice/](http://www.cdc.gov/vaccines/hcp/patient-ed/adults/for-practice/)
Guidelines for vaccinating pregnant women: Do you have questions about which vaccines your pregnant patients need? Use this table to find the general rule for vaccinating a pregnant woman with a particular vaccine. [www.cdc.gov/vaccines/pubs/preg-guide.htm](http://www.cdc.gov/vaccines/pubs/preg-guide.htm)

**Influenza resources:** CDC offers a wealth of influenza vaccination information and resources at [www.cdc.gov/flu](http://www.cdc.gov/flu) for patients and healthcare professionals.

**Pertussis resources:** Pertussis vaccines are recommended for people of all ages, including pregnant women. CDC has a variety of pertussis vaccination resources available. [www.cdc.gov/pertussis](http://www.cdc.gov/pertussis)

**Standards for Adult Immunization:** CDC has resources, information and tips to improve your vaccination practice including assessment, recommendation, administration, referral and documentation. [www.cdc.gov/vaccines/hcp/patient-ed/adults/for-practice/standards/index.html](http://www.cdc.gov/vaccines/hcp/patient-ed/adults/for-practice/standards/index.html)
Recommended vaccines for adults: You can send your patients to this CDC website to learn about why vaccines are important and which vaccines may be recommended for them depending on their age, job, lifestyle, travel, or health condition. www.cdc.gov/vaccines/adults

Resources for your adult patients: Find free patient handouts, posters, web buttons and banners, ready-to-publish articles, and sample tweets and social media posts. Resources are available for the following groups of adults: adults (general), pregnant women, travelers, adults with chronic health conditions, Spanish speakers, and healthcare workers. www.cdc.gov/vaccines/AdultPatientEd

Vaccine quiz for adolescents and adults: This web-based, interactive quiz helps adolescents and adults find out which vaccines they may need. www2.cdc.gov/nip/adultimmsched/

Vaccine safety: You can send patients to the CDC Vaccine Safety web page to learn about vaccine safety basics, and how vaccines are monitored. www.cdc.gov/vaccinesafety/
Contact Information

1-800-CDC-INFO (1-800-232-4636): CDC-INFO is CDC’s National Contact Center. It is your single source for accurate, timely, consistent, and science-based information on a wide variety of disease prevention and health promotion topics, including immunization. www.cdc.gov/cdc-info/

nipinfo@cdc.gov: You can submit immunization or vaccine-preventable disease-related questions to this e-mail address. You will get an answer from a CDC immunization expert, usually within 24 hours.

CDC-INFO On Demand: CDC immunization publications are available for ordering at CDC-INFO on Demand. You can search for immunization publications using the “Programs” drop down menu and selecting “Immunization and Vaccines,” or you can search by “Title.” wwnn.cdc.gov/pubs/cdcinfoondemand.aspx

@CDCIZLearn on Twitter: This is the leading source for you on immunization training and recommendations, as well as vaccine information across the lifespan. twitter.com/cdcizlearn

State immunization programs: Visit your state/city/island’s immunization program website to learn more. www.cdc.gov/vaccines/imz-managers/awardee-imz-websites.html

Partner Organizations: CDC immunization partner organizations provide a wealth of additional resources. Partner contacts can be found at www.cdc.gov/vaccines/imz-managers/partners.html.
Figure 1. Recommended immunization schedule for adults aged 19 years or older, by vaccine and age group

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>AGE GROUP</th>
<th>19-21 years</th>
<th>22-26 years</th>
<th>27-49 years</th>
<th>50-59 years</th>
<th>60-64 years</th>
<th>≥ 65 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>1 dose annually</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
<td>1 dose annually</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varicella</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female*</td>
<td>3 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Male*</td>
<td>3 doses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster*</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal 13-valent conjugate (PCV13)*</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal 23-valent polysaccharide (PPSV23)*</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis A*</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B*</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)*</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal B (MenB)*</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)*</td>
<td>1 dose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Covered by the Vaccine Injury Compensation Program

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hhs.gov or by telephone, 800-822-7967. Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. - 8:00 p.m. Eastern Time, Monday - Friday, excluding holidays.

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

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

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

<table>
<thead>
<tr>
<th>VACCINE</th>
<th>INDICATION</th>
<th>IMMUNOSUPPRESSION</th>
<th>HIV INFECTION CD4 COUNT</th>
<th>AIDS DIAGNOSIS</th>
<th>KIDNEY FAILURE</th>
<th>CHRONIC LUNG DISEASE</th>
<th>CHRONIC HEPATITIS</th>
<th>CHRONIC RENAL DISEASE</th>
<th>CHRONIC LIVER DISEASE</th>
<th>CHRONIC CARDIAC DISEASE</th>
<th>DIABETES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>Pregnancy</td>
<td>1 dose annually</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus, diphtheria, pertussis (Td/Tdap)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Varicella</td>
<td>Contraindicated</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human papillomavirus (HPV) Female*</td>
<td>3 doses through age 26 yrs</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Human papillomavirus (HPV) Male*</td>
<td>3 doses through age 26 yrs</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zoster*</td>
<td>1 dose</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella (MMR)</td>
<td>Contraindicated</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pneumococcal 13-valent conjugate (PCV13)*</td>
<td>1 dose</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Pneumococcal polysaccharide (PPSV23)*</td>
<td>1 dose</td>
<td></td>
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</tr>
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<td>Hepatitis A*</td>
<td>2 doses</td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hepatitis B*</td>
<td>3 doses</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal 4-valent conjugate (MenACWY) or polysaccharide (MPSV4)*</td>
<td>1 dose</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meningococcal B (MenB)*</td>
<td>1 dose</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemophilus influenzae type b (Hib)*</td>
<td>1 dose</td>
<td></td>
<td></td>
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</tbody>
</table>

*Covered by the Vaccine Injury Compensation Program

Recommended Adult Immunization Schedule—United States - 2016

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.
Footnotes—Recommended Immunization Schedule for Adults Aged 19 Years or Older: United States, 2016

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

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

3. Tetanus, diphtheria, and acellular pertussis (Tdap) vaccination
   • Administer 1 dose of Tdap vaccine to pregnant women during each pregnancy (preferably 26–36 weeks’ gestation) regardless of interval since prior Td or Tdap vaccination.
   • Persons aged ≥11 years who have not received Tdap vaccine or for whom vaccine status is unknown should receive Tdap followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter. Tdap can be administered regardless of interval since the most recent tetanus or diphtheria-containing vaccine.
   • Adults with an unknown or incomplete history of completing a 3-dose primary vaccination series with Td-containing vaccines should begin or complete a primary vaccination series including a Tdap dose.
   • For unvaccinated adults, administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second.
   • For incompletely vaccinated (i.e., less than 3 doses) adults, administer remaining doses.
   • Refer to the ACIP statement for recommendations for administering Td/Tdap as prophylaxis in wound management (see footnote 1).

4. Varicella vaccination
   • All adults without evidence of immunity to varicella (as defined below) should receive 2 doses of single-antigen varicella vaccine or a second dose if they have received only 1 dose.
   • Vaccination should be emphasized for those who have close contact with persons at high risk for severe disease (e.g., health care personnel and family contacts of persons with immunocompromising conditions) or at high risk for exposure (e.g., teachers; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adults living in households with children; nonpregnant women of childbearing age; and international travelers).
   • Pregnant women should be assessed for evidence of varicella immunity. Women who do not have evidence of immunity should receive the first dose of varicella vaccine upon completion or termination of pregnancy and before discharge from the care facility. The second dose should be administered 4–6 weeks after the first dose.
   • Evidence of immunity to varicella in adults includes any of the following:
     — Documented history of varicella vaccination with 2 doses of varicella vaccine at least 4 weeks apart; or
     — U.S.-born before 1980, except health care personnel and pregnant women;
     — History of varicella vaccine on diagnosis or verification of varicella disease by a health care provider;
     — History of herpes zoster disease by a health care provider;
     — Laboratory evidence of immunity or laboratory confirmation of disease.

5. Human papillomavirus (HPV) vaccination
   • HPV vaccines are licensed for use in females (bivalent HPV vaccine [2vHPV]; quadravalent HPV vaccine [4vHPV]; and 9-valent HPV vaccine [9vHPV]) and two HPV vaccines are licensed for use in males (4vHPV and 9vHPV).
   • For females, 2vHPV, 4vHPV, or 9vHPV is recommended in a 3-dose series for routine vaccination at age 11 or 12 years and for those aged 13 through 26 years, if not previously vaccinated.
   • For males, 4vHPV or 9vHPV is recommended in a 3-dose series for routine vaccination at age 11 or 12 years and for those aged 13 through 21 years, if not previously vaccinated at age ≥22 through 26 years may be vaccinated.
   • HPV vaccination is recommended for men who have sex with men through age 26 years who did not get any or all doses when they were younger.
   • Vaccination is recommended for immunocompromised persons (including those with HIV infection) through age 26 years who did not get any or all doses when they were younger.
   • A complete HPV vaccination series consists of 3 doses. The second dose should be administered 4–8 weeks (minimum interval of 4 weeks) after the first dose; the third dose should be administered 24 weeks after the first dose and 16 weeks after the second dose (minimum interval of 12 weeks).
Footnotes—Recommended Immunization Schedule for Adults Aged 19 Years or Older: United States, 2016

10. Hepatitis B vaccination

- Vaccinate any person seeking protection from hepatitis B virus (HAV) infection and persons with any of the following indications:
  - men who have sex with men;
  - persons who use injection or noninjection illicit drugs;
  - persons with chronic liver disease and persons who receive clotting factor concentrates;
  - persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (see footnote 1); and unvaccinated persons who anticipate close personal contact (e.g., household or regular bathing) with an international adoptee during the first 50 days after arrival in the United States from a country with high or intermediate endemicity of hepatitis A (see footnote 1). The first dose of the 2-dose hepatitis A vaccine series should be administered as soon as adoption is planned, ideally 2 or more weeks before the arrival of the adoptee.

- Single-antigen vaccine formulations should be administered in a 2-dose schedule at either 0 and 12 months (Havrix), or at 0 and 6 months (Twinrix). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, administer 3 doses at 0, 1, and 6 months, alternatively, a 4-dose schedule may be used, administered on days 0, 7, 21–30 followed by a booster dose at 12 months.

11. Meningococcal vaccination

- General information
  - Serogroup A, C, W, and Y meningococcal vaccine is available as a conjugate (MenACWY [Menactra, Menveo]; or polysaccharide [MPSV4 [Menomune] vaccine.
  - Serogroup B meningococcal (MenB) vaccine is available as a 2-dose series of MenB-4C vaccine (Bexsero) administered at least 1 month apart or a 3-dose series of MenB-Refer (Trumena) vaccine administered at 0, 2, and 6 months; the two MenB vaccines are noninterchangeable, i.e., the same MenB vaccine product must be used for all doses.
  - MenACWY vaccine is preferred for adults with serogroup A, C, W, and Y meningococcal vaccine indications who are aged ≥18 years and ≥65 years: 1) who were vaccinated previously with MenACWY vaccine and are recommended for revaccination; or 2) for whom multiple doses of vaccine are anticipated and 4-dose vaccine is preferred for adults aged ≥65 years who have not received MenACWY vaccine previously and who require a single dose only; or 3) persons at risk for meningococcal disease.

Revaccination with MenACWY vaccine every 5 years is recommended for adults previously vaccinated with MenACWY or MPSV4 vaccine who remain at increased risk for infection; adults with anatomical or functional asplenia or persistent complement component deficiencies, or microorganisms who are routinely exposed to isolates of Neisseria meningitidis.

MenB vaccine is approved for use in persons aged 10 through 25 years; however, because there is no theoretical difference in safety for persons aged >25 years compared to those aged 10 through 25 years, MenB vaccine is recommended for routine use in persons aged ≥10 years who are at increased risk for serogroup B meningococcal disease.

There is no routine recommendation for MenB vaccination at this time.

- MenB vaccine may be administered concomitantly with MenACWY vaccine but at a different anatomic site, if feasible.

- HIV infection is not an indication for routine vaccination with MenACWY or MenB vaccine; if an HIV-infected person of any age is to be vaccinated, administer 2 doses of MenACWY vaccine at least 2 months apart.

- Adults with anatomical or functional asplenia or persistent complement component deficiencies: administer 2 doses of MenACWY vaccine at least 2 months apart and revaccinate every 5 years. Also administer a series of MenB vaccine.

- Microbiologists who are routinely exposed to isolates of Neisseria meningitidis: administer a single dose of MenACWY vaccine; if an HIV-infected person of any age is to be vaccinated, administer 2 doses of MenACWY vaccine at least 2 months apart.

12. Haemophilus influenzae type b (Hib) vaccination

- One dose of Hib vaccine should be administered to persons who have anatomical or functional sickle cell disease or are undergoing elective splenectomy if they have not previously received Hib vaccine.

- Recipients of a hematopoietic stem cell transplant (HSCT) should be vaccinated with a 3-dose regimen 6–12 months after a successful transplant, regardless of vaccination history; at least 4 weeks should separate doses.

- Hib vaccine is not recommended for adults with HIV infection since their risk for Hib infection is low.

13. Immunocompromising conditions

- Vaccinates (e.g., pneumococcal, meningococcal, and inactivated influenza vaccines) generally are acceptable and live vaccines generally should be avoided in persons with immune deficiencies or immunocompromising conditions. Information on specific conditions is available at http://www.cdc.gov/vaccines/hcp/acip-recs/index.html.
Recommended Immunization Schedules for Persons Aged 0 Through 18 Years
UNITED STATES, 2016

This schedule includes recommendations in effect as of January 1, 2016. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at http://www.cdc.gov/vaccines/hcp/acip-recs/index.html. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (http://www.vaers.hhs.gov) or by telephone (800-822-7967).

The Recommended Immunization Schedules for Persons Aged 0 Through 18 Years are approved by the

Advisory Committee on Immunization Practices
(http://www.cdc.gov/vaccines/acip)

American Academy of Pediatrics
(http://www.aap.org)

American Academy of Family Physicians
(http://www.aafp.org)

American College of Obstetricians and Gynecologists
(http://www.acog.org)
**Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2016.**

*For those who fall behind or start late, see the catch-up schedule (Figure 2).*

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded.

This schedule includes recommendations in effect as of January 1, 2016. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at [http://www.cdc.gov/vaccines/hcp/acip-recs/index.html](http://www.cdc.gov/vaccines/hcp/acip-recs/index.html). Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online ([http://www.vaers.hhs.gov](http://www.vaers.hhs.gov)) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online ([http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm](http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm)) or by telephone (800-CDC-INFO [800-232-4636]).

This schedule is approved by the Advisory Committee on Immunization Practices ([http://www.cdc.gov/vaccines/acip](http://www.cdc.gov/vaccines/acip)), the American Academy of Pediatrics ([http://www.aap.org](http://www.aap.org)), the American Academy of Family Physicians ([http://www.aafp.org](http://www.aafp.org)), and the American College of Obstetricians and Gynecologists ([http://www.acog.org](http://www.acog.org)).

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**NOTE:** The above recommendations must be read along with the footnotes of this schedule.

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### Vaccine Schedule

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Birth</th>
<th>1 mo</th>
<th>2 mos</th>
<th>4 mos</th>
<th>6 mos</th>
<th>9 mos</th>
<th>12 mos</th>
<th>15 mos</th>
<th>18 mos</th>
<th>19-23 mos</th>
<th>2-3 yrs</th>
<th>4-6 yrs</th>
<th>7-10 yrs</th>
<th>11-12 yrs</th>
<th>13-15 yrs</th>
<th>16-18 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hepatitis B</strong> (HepB)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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</tr>
<tr>
<td><strong>Rotavirus</strong> (RV)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>See footnote 2</td>
<td></td>
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</tr>
<tr>
<td><strong>Diphtheria, tetanus, &amp; acellular pertussis</strong> (DTaP)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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</tr>
<tr>
<td><strong>Hemophilus influenzae type b</strong> (Hib)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>See footnote 4</td>
<td></td>
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<tr>
<td><strong>Pneumococcal conjugate</strong> (PCV13)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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</tr>
<tr>
<td><strong>Inactivated poliovirus</strong> (IPV)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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<tr>
<td><strong>Influenza</strong> (IIV; LAIV)</td>
<td>See footnote 8</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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</tr>
<tr>
<td><strong>Measles, mumps, rubella</strong> (MMR)</td>
<td>See footnote 10</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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<tr>
<td><strong>Varicella</strong> (VAR)</td>
<td>See footnote 10</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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<tr>
<td><strong>Hepatitis A</strong> (HepA)</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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<tr>
<td><strong>Meningococcal</strong> (MenB)</td>
<td>See footnote 11</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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</tr>
<tr>
<td><strong>Tetanus, diphtheria, &amp; acellular pertussis</strong> (Tdap)</td>
<td>(Tdap ≥ 7 yrs)</td>
<td></td>
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</tr>
<tr>
<td><strong>Human papillomavirus</strong> (HPV)</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
<td>6th dose</td>
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</tr>
<tr>
<td><strong>Meningococcal</strong> (MenACWY)</td>
<td>See footnote 11</td>
<td>1st dose</td>
<td>2nd dose</td>
<td>3rd dose</td>
<td>4th dose</td>
<td>5th dose</td>
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</tr>
</tbody>
</table>

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**Legend:**
- **Range of recommended ages for all children**
- **Range of recommended ages for catch-up immunization**
- **Range of recommended ages for certain high-risk groups**
- **Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision making**
- **No recommendation**
**FIGURE 2.** Catch-up immunization schedule for persons aged 4 months through 18 years who start late or who are more than 1 month behind —United States, 2016.

The figure below provides catch-up schedules and minimum intervals between doses for children whose vaccinations have been delayed. A vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Use the section appropriate for the child's age. Always use this table in conjunction with Figure 1 and the footnotes that follow.

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Minimum Age for Dose 1</th>
<th>Minimum Interval Between Doses</th>
<th>Children age 4 months through 6 years</th>
<th>Children age 7 through 18 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dose 1 to Dose 2</td>
<td>Dose 2 to Dose 3</td>
</tr>
<tr>
<td><strong>Hepatitis B</strong></td>
<td>Birth</td>
<td>8 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rotavirus</strong></td>
<td>6 weeks</td>
<td>4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diphtheria, tetanus, and acellular pertussis</strong></td>
<td>6 weeks</td>
<td>4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Haemophilus influenza type b</strong></td>
<td>6 weeks</td>
<td>4 weeks if first dose was administered before the 1st birthday</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>8 weeks (min dose) if first dose was administered at age 12 through 14 months.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 weeks if first dose was administered at age 13 months or older.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pneumococcal</strong></td>
<td>6 weeks</td>
<td>4 weeks if first dose was administered before the 1st birthday.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 weeks (min dose) if first dose was administered at age 12 through 14 months.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8 weeks if first dose was administered at age 13 months or older.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inactivated poliovirus</strong></td>
<td>6 weeks</td>
<td>4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>12 months</td>
<td>4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Varicella</strong></td>
<td>12 months</td>
<td>3 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hepatitis A</strong></td>
<td>12 months</td>
<td>6 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meningococcal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib-MenCY ≥6 weeks; MenACWY-CRM ≥ 2 mos</td>
<td>6 weeks</td>
<td>8 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>12 months</td>
<td>4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Varicella</strong></td>
<td>12 months</td>
<td>3 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meningococcal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib-MenCY ≥6 weeks; MenACWY-CRM ≥ 2 mos</td>
<td>6 weeks</td>
<td>8 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Tetanus, diphtheria, tetanus, diphthera, and acellular pertussis</strong></td>
<td>7 years</td>
<td>4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Human papillomavirus</strong></td>
<td>9 years</td>
<td>6 months</td>
<td>Routine dosing intervals are recommended.</td>
<td></td>
</tr>
<tr>
<td><strong>Hepatitis A</strong></td>
<td>N/A</td>
<td>6 months</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hepatitis B</strong></td>
<td>N/A</td>
<td>8 weeks and at least 16 weeks after first dose.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inactivated poliovirus</strong></td>
<td>N/A</td>
<td>4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Meningococcal</strong></td>
<td>N/A</td>
<td>8 weeks and at least 16 weeks after first dose.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measles, mumps, rubella</td>
<td>N/A</td>
<td>4 weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 months if younger than age 13 years.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Footnotes — Recommended immunization schedule for persons aged 0 through 18 years—United States, 2016

For further guidance on the use of the vaccines mentioned below, see: http://www.cdc.gov/vaccines/hcp/acip-recs/index.html.

For vaccine recommendations for persons 19 years of age and older, see the Adult Immunization Schedule.

### Additional information

- For contraindications and precautions to use of a vaccine and for additional information regarding that vaccine, vaccination providers should consult the relevant ACIP statement available online at http://www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For purposes of calculating intervals between doses, 4 weeks = 28 days. Intervals of 4 months or greater are determined by calendar months.
- Vaccine doses administered 4 days or less before the minimum interval are considered valid. Doses of any vaccine administered ≥5 days earlier than the minimum interval or minimum age should not be counted as valid doses and should be repeated as age-appropriate. The repeat dose should be spaced after the invalid dose by the recommended minimum interval. For further details, see MMWR General Recommendations on Immunization and Reports (Vol. 60 / No. 2, Table 1). Recommended minimum intervals and combinations between vaccine doses available online at http://www.cdc.gov/mmwr/pdf/rr/rr6002.pdf.
- Information on travel vaccine requirements and recommendations is available at http://www.cdc.gov/travel/destinations/list.


### 1. Hepatitis B (HepB) vaccine. (Minimum age: birth)

**Routine vaccination:**

- **At birth:** Administer monovalent HepB vaccine to all newborns before hospital discharge.
- **For infants born to hepatitis B surface antigen (HBsAg) positive mothers,** administer HepB vaccine and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth. These infants should be tested for HBsAg and antibody to HBsAg (anti-HBs) at age 9 through 18 months (preferably at the next well-child visit) or 1 to 2 months after completion of the HepB series if the series was delayed. CDC recently recommended testing occur at age 9 through 12 months; see http://www.cdc.gov/mmwr/preview/mmwr_wk/mmwrhtml/mm6015a4.htm.
- **If mother’s HBsAg status is unknown,** within 12 hours of birth administer HepB vaccine regardless of birth weight. For infants weighing less than 2,000 grams, administer HBIG in addition to HepB vaccine within 12 hours of birth. Determine mother’s HBsAg status as soon as possible and, if HBsAg positive, also administer HBIG for infants weighing 2,000 grams or more as soon as possible, but no later than age 27 days.

**Doses following the birth dose:**

- The second dose should be administered at age 1 or 2 months. Monovalent HepB vaccine should be used for doses administered before age 6 weeks.
- Infants who did not receive a birth dose should receive 3 doses of a HepB-containing vaccine on a schedule of 0.1 to 2 months, and 6 months starting as soon as feasible. See Figure 2.
- **At 6 months:** Administer the third dose at least 8 weeks after the second dose AND at least 16 weeks after the first dose. The final third or fourth dose in the HepB vaccine series should be administered no earlier than age 24 weeks.
- Administration of a total of 4 doses of HepB vaccine is permitted when a combination vaccine containing HepB is administered after the birth dose.

**Catch-up vaccination:**

- Unvaccinated persons should complete a 3-dose series.
- A 2-dose series (doses separated by at least 4 months) of adult formulation Recombivax HB is licensed for use in children aged 11 through 15 years.
- For other catch-up guidelines, see Figure 2.

### 2. Rotavirus (RV) vaccines. (Minimum age: 6 weeks for both RV1 [Rotarix] and RV5 [Rotaq])

**Routine vaccination:**

- Administer a series of RV vaccine to all infants as follows:
  1. If Rotarix is used, administer a 2-dose series at 2 and 4 months of age.
  2. If Rotaq is used, administer a 3-dose series at ages 2, 4, and 6 months.
  3. If any dose in the series was Rotarix or vaccine product is unknown for any dose in the series, a total of 3 doses of RV vaccine should be administered.

**Catch-up vaccination:**

- **The maximum age for the first dose in the series is 14 weeks,** 6 months; vaccine should not be initiated for infants aged 15 weeks, 0 days or older.
- **The maximum age for the final dose in the series is 8 months,** 0 days.
- For other catch-up guidelines, see Figure 2.

### 3. Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine. (Minimum age: 6 weeks; Exception: DTaP-IPV [Kinrix, Quadracel]: 4 years)

**Routine vaccination:**

- Administer a 4-dose series of DTaP vaccine at ages 2, 4, 6, and 15 through 18 months, and 4 through 6 years.
- **The fourth dose** may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.
- **Inadvertent administration of 4th DTaP dose early:** If the fourth dose of DTaP was administered at least 4 months, but less than 6 months, after the third dose of DTaP, it need not be repeated.

**Catch-up vaccination:**

- Administer a dose of DTaP vaccine at age 12 through 14 months, and 4 through 6 years. The fourth dose may be administered as early as age 12 months, provided at least 6 months have elapsed since the third dose.
- One booster dose (dose 3 or 4 depending on vaccine used in primary series) of any HepB vaccine should be administered at age 12 through 15 months. An exception is HibPentacel vaccine. HibPentacel should only be used for the booster (final) dose in children aged 12 months through 4 years who have received at least 1 prior dose of Hib-containing vaccine.
- For recommendations for MenHibrix in patients who have increased risk for meningococcal disease, please refer to the meningococcal vaccine footnotes and also to MMWR February 28, 2014 / 63(RO1)1-13, available at http://www.cdc.gov/mmwr/PDF/rr/rr6301.pdf.

**Catch-up vaccination:**

- If dose 1 was administered at ages 12 through 14 months, administer a second (final) dose at least 8 weeks after dose 1, regardless of HepB vaccine used in the primary series.
- If both doses were PRP-OMP (PedvaxHIB or COMVAX), and were administered before the first birthday, the third (and final) dose should be administered at age 12 through 59 months and at least 8 weeks after the second dose.
- If the first dose was administered at age 7 through 11 months, administer the second dose at least 4 weeks later and a third (and final) dose at age 12 through 15 months or 8 weeks after a second dose, whichever is later.
- **If first dose is administered before the first birthday and second dose administered at younger than 15 months, a third (and final) dose should be administered 8 weeks later.**
- For unvaccinated children aged 15 months or older, administer only 1 dose.
- For other catch-up guidelines, see Figure 2. For catch-up guidance related to MenHibrix, please see the meningococcal vaccine footnotes and also MMWR February 28, 2014 / 63(RO1)1-13, available at http://www.cdc.gov/mmwr/PDF/rr/rr6301.pdf.

**Vaccination of persons with high-risk conditions:**

- Children aged 12 through 59 months who are at increased risk for Hib disease, including chemotherapy recipients and those with anatomic or functional asplenia (including sickle cell disease), human immunodeficiency virus (HIV) infection, immunoglobulin deficiency, or early component complement deficiency, who have received either no doses or only 1 dose of Hib vaccine before 12 months of age, should receive 2 additional doses of Hib vaccine 8 weeks apart; children who received 2 more doses of Hib vaccine before 12 months of age should receive 1 additional dose.
- For patients younger than 5 years of age undergoing chemotherapy or radiation treatment who received a Hib vaccine dose(s) within 14 days of starting therapy or during therapy, repeat the dose(s) at least 3 months following therapy completion.
- **Patients who received 2 doses of Hib vaccine within 14 days of starting therapy or during therapy, should not receive an additional dose.**
- Children younger than 5 years of age who received either no doses or only 1 dose of Hib vaccine before 12 months of age should receive a single dose of any Hib-containing vaccine at least 14 days after successful treatment, regardless of vaccination history; doses should be administered at least 4 weeks apart.
- For other catch-up guidelines, see Figure 2. For catch-up guidance related to MenHibrix, please see the meningococcal vaccine footnotes and also MMWR February 28, 2014 / 63(RO1)1-13, available at http://www.cdc.gov/mmwr/PDF/rr/rr6301.pdf.
For further guidance on the use of the vaccines mentioned below, see: http://www.cdc.gov/vaccines/hcp/acip-recs/index.html.
10. Hepatitis A (HepA) vaccine (cont’d)

Special populations:
- Children 2 doses of HepA vaccine at least 6 months apart to previously unvaccinated children who are at increased risk for infection. This includes persons traveling to or working in countries that have high or intermediate endemicity of infection; men having sex with men; users of injection and non-injection drugs; persons who work with HIV-infected primates or with HIV in a research laboratory; persons with clotting factor disorders; persons with chronic liver disease; and persons who anticipate close personal contact (e.g., household or regular babysitting) with an international adoptee during the first 60 days after arrival in the United States from a country with high or intermediate endemicity. The first dose should be administered as soon as the adoption is planned, ideally 2 or more weeks before the arrival of the adoptee.

11. Meningococcal vaccines. [Minimum age: 6 weeks for Hib-MenC (MenHibrix), 9 months for MenACWY-D (Menactra), 2 months for MenACWY-CRM (Menveo), 10 years for serogroup B meningococcal (MenB) vaccines MenB-4C (Bexsero) and MenB-Fhusp (Trumenba)]

Routine vaccination:
- Administer a single dose of Menactra or Menveo vaccine at age 11 through 12 years, with a booster dose at age 16 years.
- Adolescents aged 11 through 18 years with human immunodeficiency virus (HIV) infection should receive a 4-dose primary series of Menactra or Menveo with at least 8 weeks between doses.
- For children aged 2 months through 18 years with high-risk conditions, see below.

Catch-up vaccination:
- Administer Menactra or Menveo vaccine at age 13 through 18 years if not previously vaccinated.
  - If the first dose is administered at age 13 through 15 years, a booster dose should be administered at age 16 through 18 years with a minimum interval of at least 8 weeks between doses.
  - If the first dose is administered at age 16 years or older, a booster dose is not needed.
  - For other catch-up guidance, see Figure 2.

Clinical discretion:
- Young adults aged 16 through 23 years (preferred age range is 16 through 18 years) may be vaccinated only with a 2-dose series of Bexsero or a 3-dose series of Trumenba vaccine to provide short-term protection against most strains of serogroup B meningococcal disease. The two MenB vaccines are not interchangeable; the same vaccine product must be used for all doses.

Vaccination of persons with high-risk conditions and other persons at increased risk of disease:
- Children with anatomic or functional asplenia (including sickle cell disease)

Meningococcal conjugate ACWY vaccines:
1. Menveo
   - Children who initiate vaccine at 8 weeks: Administer doses at 2, 4, 6, and 12 months of age.
   - Unvaccinated children who initiate vaccination at 7 through 23 months: Administer 2 doses, with the second dose at least 12 weeks after the first dose.
   - Children 24 months and older who have not received a complete series: Administer 2 primary doses at least 8 weeks apart.

2. MenHibrix
   - Children who initiate vaccine at 6 weeks: Administer doses at 2, 4, 6, and 12 through 15 months of age.
   - If the first dose of MenHibrix is given at or after 12 months of age, a total of 2 doses should be given at least 8 weeks apart to ensure protection against serogroups C and Y meningococcal disease.

Meningococcal B vaccine:
1. Bexsero or Trumenba
   - Persons 10 years or older who have not received a complete series: Administer 2 doses, with the second dose at least 12 weeks after the first dose.
   - Children aged 11 through 18 years who have not received a meningococcal B vaccine: The same vaccine product must be used for all doses.

12. Tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine. (Minimum age: 10 years for both Boostrix and Adacel)

Routine vaccination:
- Administer 1 dose of Td vaccine to all adolescents aged 11 through 12 years.
- Tdap may be administered regardless of the interval since the last tetanus and diphtheria toxoid-containing vaccine.
- Administer 1 dose of Tdap vaccine to pregnant adolescents during each pregnancy (preferred during 27 through 36 weeks gestation) regardless of time since prior Td or Tdap vaccination.

Catch-up vaccination:
- Persons aged 7 years and older who are not fully immunized with DTaP vaccine should receive Tdap vaccine as part of the catch-up series.
- If a Tdap dose is administered at age 10 years, a booster dose should be given at age 11 through 12 years.
- If a Tdap dose is administered at age 16 years or older, a booster dose is not needed.
- Clinical discretion:
  - Young adults aged 16 through 23 years (preferred age range is 16 through 18 years) may be vaccinated only with a 2-dose series of Bexsero or a 3-dose series of Trumenba vaccine to provide short-term protection against most strains of serogroup B meningococcal disease. The two MenB vaccines are not interchangeable; the same vaccine product must be used for all doses.

13. Human papillomavirus (HPV) vaccines. (Minimum age: 9 years for 2vHPV [Cervarix], 4vHPV [Gardasil] and 9vHPV [Gardasil 9])

Routine vaccination:
- Administer a 3-dose series of HPV vaccine on a schedule of 0, 2, and 6 months to all adolescents aged 11 through 12 years.
- 4vHPV or 9vHPV may be used for females, and only 4vHPV or 9vHPV may be used for males.
- The vaccine series may be started at age 9 years.
- Administer the second dose 1 to 2 months after the first dose (minimum interval of 4 weeks).
- Administer the third dose 16 weeks after the second dose (minimum interval of 12 weeks) and 24 weeks after the first dose.
- Administer HPV vaccine beginning at age 9 years to children and youth with any history of sexual abuse or assault who have not initiated or completed the 3-dose series.

Catch-up vaccination:
- Administer the vaccine series to females (2vHPV or 4vHPV or 9vHPV) and males (4vHPV or 9vHPV) at age 13 through 18 years if not previously vaccinated.
- Use recommended routine dosing intervals (see Routine vaccination above) for vaccine series catch-up.
Bibliography


