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Get complete knowledge on Vaccinations and 2013 Recommended Immunization Schedules.

What are vaccines?

The immune system protects the body against illness and infection. When a person's immune system recognizes a foreign organism (bacterium, virus), it responds by creating proteins called antibodies. Antibodies fight the infection and help the person to recover.

Antibodies also work to prevent a person from becoming ill in the future. The next time a person is exposed to the organism, the immune system recognizes it and rapidly produces the antibodies required to destroy the organism. This response protects the individual from developing the disease, ideally for life. For example, a person who had chickenpox as a child is unlikely to develop it again, even if he or she is in close contact with a person who is infected.

Vaccines work by stimulating the immune system to produce antibodies. However, unlike bacteria and viruses, vaccines do not cause the person to become ill in order to develop these antibodies. There are two main types of immunizations: active and passive.

Active vaccines — Active vaccines use a weakened form of the harmful bacteria or virus or components of the bacteria or virus to stimulate the immune system. Some active vaccines are called live vaccines because they are made from a weakened form of the bacterium or virus.

Some bacteria (eg, diphtheria, tetanus) cause illness because they produce a harmful substance in the body called toxins. Vaccines that help the immune system protect the body from toxins are called toxoids. Toxoids are made from weakened forms of the toxins of bacteria.

Passive vaccines — Passive vaccines provide temporary immunity with antibodies obtained from a large pool of donors; this preparation is known as immune serum globulin. Passive vaccines offer short-term protection to children or adults who have been exposed to a specific organism

Reasons to avoid vaccination — A particular vaccine may not be recommended for people with a serious allergic reaction to the following:

- Eggs or egg protein, since some vaccines are prepared with embryonic chicken eggs or cultures (eg, influenza vaccine, yellow fever vaccine). A mild allergy to eggs does **not** mean that the vaccine should be avoided.
- The antibiotic medications neomycin or streptomycin (some vaccines contains trace amounts of neomycin)
- Gelatin
- A specific vaccine

In addition, live virus vaccines, including the measles, mumps, and rubella vaccine and the varicella vaccine are generally not recommended for the following groups:

- Those with a weakened immune system, since there is an increased risk of infection as a result of the vaccination
- Patients who have recently received a blood transfusion or immune serum globulin, which can delay the normal response to active vaccination. In this case, the vaccination should be delayed for one month.
- Women who are pregnant or considering becoming pregnant within the next 28 days, due to the potential risk of the vaccine to the developing fetus.

In some cases, there is an alternative vaccine that is not live that can be used. For example, the injectable form of the influenza vaccine is not live and is recommended for those who cannot receive live vaccines, such as pregnant women and those with a weakened immune system.

Conditions that do not affect vaccination — The following conditions do not require that a person delay or avoid vaccination:

- Current or recent mild illness, with or without low grade fever
- Current or recent antibiotic therapy
- Previous mild to moderate tenderness, redness, or swelling at the site of injection or fever less than 104.9 ºF (40.5ºC) after any previous vaccination
- A personal history of allergies, except those listed above
- A family history of adverse reactions to vaccines

IMMUNIZATIONS:

1- **Pneumococcal** — Pneumonia is a serious lung infection that can be fatal, especially in elderly people, individuals with underlying medical conditions, and those with a weakened immune system. Pneumonia is usually caused by bacteria; the most common is Streptococcus pneumoniae, or pneumococcus. Pneumococcal pneumonia can develop as a complication of a respiratory tract viral infection such as influenza.

Dosage form: IM injection. Usual dose: 0.5 ml.

2- Tetanus, diphtheria, pertussis

- Tetanus is a wound infection caused by a bacterial toxin. The bacterium resides in soil and the intestinal tracts of certain mammals and enters the body through a wound; it then multiplies and produces toxins that act on nerves controlling muscle activity.
- Diphtheria is a sudden illness caused by a bacterium that is usually transmitted via droplets coughed or sneezed into the air. The bacteria typically multiply in the throat and may release a toxin into the bloodstream, which can lead to damage of the brain and heart.
- Pertussis, or whooping cough, is an upper respiratory illness caused by a bacterium called Bordetella pertussis. The bacterium is spread easily and can cause serious illness, especially in infants and people with a weakened immune system.

3- **Influenza** — commonly known as flu, influenza is a highly contagious viral infection that occurs in outbreaks worldwide, usually in the winter season in the United States and other non-tropical regions. Serious complications can develop in people with influenza, including bacterial pneumonia.

Dosage Form: Injection (IM, SC,intradermal) . Usual Dose: 0.5 ml.

4- **Measles-mumps-rubella (MMR)** — Measles, mumps, and rubella are transmitted by infected patients who release airborne droplets while coughing or sneezing.

- Measles is a highly contagious viral illness of the respiratory tract that primarily affects children; it causes a distinctive rash, fever, and cough, and may result in complications, including infection of the middle ear and lungs.
- Mumps, an acute, usually mild viral infection of childhood, is primarily characterized by painful swelling of the salivary glands; however, complications may sometimes result, including inflammation of the protective membranes of the brain (meningitis) and, in males affected after puberty, swelling and tenderness of one or both testes (orchitis).
- Rubella, also known as German measles, is typically a mild viral infection characterized by fever, swelling of the lymph nodes, and rash; however, it can cause severe birth defects (congenital rubella syndrome) if the mother is affected during early pregnancy.

Dosage form: Injection/SC, **usual dose**: 0.5 ml.

5- **Varicella (chickenpox)** — Chickenpox is a highly contagious viral illness caused by infection with the varicella zoster virus (VZV). The disease causes fever, sore throat, and a distinctive, itchy, blistering rash that later forms scabs. The virus is transmitted by airborne droplets or direct contact with the skin rash. **Dosage Form : Injection/SC**

6- **Herpes zoster (shingles)** — Herpes zoster is caused by reactivation of the varicella-zoster virus, the same virus that causes chickenpox. After an episode of chickenpox, the virus lingers in cells of the nervous system, where it can reside quietly for decades. Herpes zoster can occur in individuals of all ages, but it is uncommon in children, adolescents, and young adults. It is much more common in adults aged 50 years and older and in those whose immune system has been weakened**. Dosage form**: Injection/SC.

7- **Hepatitis B** — Inflammation of the liver (hepatitis) is caused by infection with certain viruses, including hepatitis B virus (HBV). Although the infection often resolves or is asymptomatic (does not cause symptoms), HBV can result in chronic infection that can lead to progressive liver

scarring (cirrhosis) or liver cancer. HBV is transmitted by contact with an infected individual's body fluids, such as during unprotected sexual intercourse, the sharing of contaminated needles during injection drug use, or contact with contaminated blood or blood products. HBV can also be transmitted from a pregnant woman to her baby .**Dosage form** : Injection /IM

8- **Hepatitis A** — Hepatitis due to infection with the hepatitis A virus (HAV) is one of the most common viral infections in children and adolescents in the United States. HAV infection often causes few or no symptoms in children. By contrast, infection in adults can vary in severity from a mild flu-like illness to rapidly progressive, severe hepatitis. Vaccinating children can help to protect adult caregivers from a potentially serious illness .**Dosage Form:** Injection IM.

9- **Meningococcal** — Neisseria meningitidis is a bacterium that causes serious illnesses, including bacterial meningitis. The bacteria lives on surfaces of the nose and pharynx (wind pipe) and is transmitted from person to person by direct contact with respiratory secretions. Although meningococcal disease is easily treated in most people, 10 to 14 percent of people die from the infection. **Dosage Form:** Injection/IM**.**

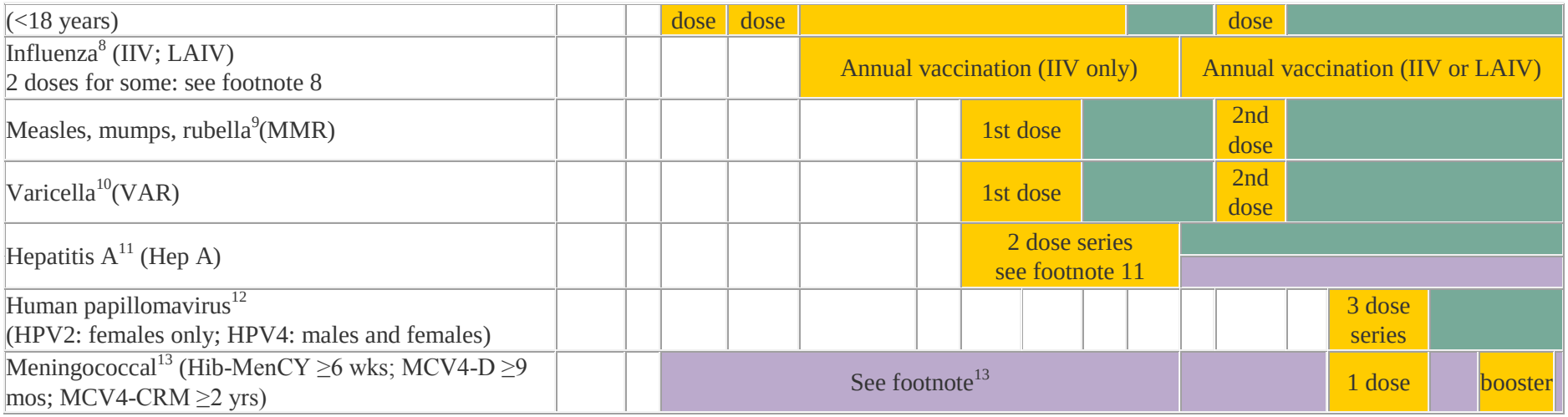
10- **Human papillomavirus (HPV)** — Human papillomavirus (HPV) causes more than 99 percent of cases of cervical cancer and genital warts. Persistent infection with certain types of HPV can lead to cancer of the cervix, anus, vagina, vulva, penis, mouth, or sinuses**. Dosage Form** :Injection/IM.

Advisory Committee on Immunization Practices (ACIP) Recommended Immunization Schedules for Persons Aged 0 Through 18 Years and Adults Aged 19 Years and Older — United States, 2013.

Figure 1. Recommended Immunization Schedule for Persons Aged 0 through 18 Years — 2013 (for those who fall behind or start late, see the catch-up schedule, below)

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. To determine minimum intervals between doses, see the catch-up schedule below. School entry and adolescent vaccine age groups are in bold.

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19-23 mos	2-3 yrs	**4-6 yrs**	7-10 yrs	**11-12 yrs**	13-15 yrs	16-18 yrs
Hepatitis B[1] (HepB)	1st dose	2nd dose			3rd dose											
Rotavirus[2] (RV) RV-1 (2-dose series); RV-5 (3-dose series)			1st dose	2nd dose	See footnote 2											
Diphtheria, tetanus, & acellular perrtussis[3] (DTaP: <7 yrs)			1st dose	2nd dose	3rd dose			4th dose				5th dose				
Tetanus, diphtheria, & acellular pertussis[4] (Tdap: ≥7 yrs)														(Tdap)		
*Haemophilus influenzae*type b[5] (Hib)			1st dose	2nd dose	See footnote 5		3rd or 4th dose see footnote 5									
Pneumococcal conjugate[6a,c] (PCV13)			1st dose	2nd dose	3rd dose		4th dose									
Pneumococcal polysaccaride[6b,c] (PPSV23)																
Inactivated poliovirus[7](IPV)			1st	2nd	3rd dose							4th				



This schedule includes recommendations in effect as of January 1, 2013. 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 ACIP statement for detailed recommendations, available online at: http://www.cdc.gov/vaccines/pubs/acip-list.htm. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS) onlinehttp://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) or by telephone (800-CDC-INFO [800-232-4636]).

This schedule is approved by the ACIP (http://www.cdc.gov/vaccines/acip/index.html), the American Academy of Pediatrics (http://www.aap.org), the American Academy of Family Physicians (http://www.aafp.org), and the American College of Obstetricians and Gynecologists (http://www.acog.org).

Note: The above recommendations must be read along with the footnotes (see below).

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, 2013

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 the accompanying childhood and adolescent immunization schedules and their respective footnotes (see below).

Persons Aged 4 Months through 6 Years					
Vaccine	**Minimum Age for Dose 1**	**Minimum Interval Between Doses**			
		Dose 1 to Dose 2	**Dose 2 to Dose 3**	**Dose 3 to Dose 4**	**Dose 4 to Dose 5**
Hepatitis B[1]	Birth	**4 weeks**	**8 weeks** and at least 16 weeks after first dose; minimum age for the final dose is 24 weeks		
Rotavirus[2]	6 weeks	**4 weeks**	**4 weeks**[2]		
Diphtheria, tetanus, pertussis[3]	6 weeks	**4 weeks**	**4 weeks**	**6 months**	**6 months**[3]
Haemophilus influenzae type b[5]	6 weeks	**4 weeks** if first dose administered at younger than age 12 months **8 weeks (as final dose)** if first dose administered at age 12-14 months **No further doses needed**	**4 weeks**[5] if current age is younger than 12 months **8 weeks (as final dose)**[5] if current age is 12 months or older and first dose administered at younger than age 12 months and second dose administered at younger than age 15 months	**8 weeks (as final dose)** This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months	

Persons Aged 4 Months through 6 Years					
Vaccine	**Minimum Age for Dose 1**	**Minimum Interval Between Doses**			
		Dose 1 to Dose 2	**Dose 2 to Dose 3**	**Dose 3 to Dose 4**	**Dose 4 to Dose 5**
		if first dose administered at age 15 months or older	**No further doses needed** if previous dose administered at age 15 months or older		
Pneumococcal[6]	6 weeks	**4 weeks** if first dose administered at younger than age 12 months **8 weeks (as final dose for healthy children)** if first dose administered at age 12 months or older or current age 24 through 59 months **No further doses needed** for healthy children if first dose administered at age 24 months or older	**4 weeks** if current age is younger than 12 months **8 weeks (as final dose for healthy children)** if current age is 12 months or older **No further doses needed** for healthy children if previous dose administered at age 24 months or older	**8 weeks (as final dose)** This dose only necessary for children aged 12 months through 59 months who received 3 doses before age 12 months or for children at high risk who received 3 doses at any age	
Inactivated poliovirus[7]	6 weeks	**4 weeks**	**4 weeks**	**6 months**[7] minimum age 4 years for final dose	
Meningococcal[13]	6 weeks	**8 weeks**[13]	see footnote 13	see footnote 13	
Measles, mumps, rubella[9]	12 months	**4 weeks**			

Persons Aged 4 Months through 6 Years					
Vaccine	**Minimum Age for Dose 1**	**Minimum Interval Between Doses**			
		Dose 1 to Dose 2	**Dose 2 to Dose 3**	**Dose 3 to Dose 4**	**Dose 4 to Dose 5**
Varicella[10]	12 months	**3 months**			
Hepatitis A[11]	12 months	**6 months**			
Persons Aged 7 through 18 Years					
Tetanus, diphtheria; tetanus, diphtheria, pertussis[4]	7 years[4]	**4 weeks**	**4 weeks** if first dose administered at younger than age 12 months **6 months** if first dose administered at age 12 months or older	**6 months** if first dose administered at younger than age 12 months	
Human papillomavirus[12]	9 years	**Routine dosing intervals are recommended**[12]			
Hepatitis A[11]	12 months	**6 months**			
Hepatitis B[1]	Birth	**4 weeks**	**8 weeks** (and at least 16 weeks after first dose)		
Inactivated poliovirus[7]	6 weeks	**4 weeks**	**4 weeks**[7]	**6 months**[7]	
Meningococcal[13]	6 weeks	**8 weeks**[13]			
Measles, mumps, rubella[9]	12 months	**4 weeks**			
Varicella[10]	12 months	**3 months** if the person is younger than age 13 years			

Persons Aged 4 Months through 6 Years					
Vaccine	**Minimum Age for Dose 1**	**Minimum Interval Between Doses**			
		Dose 1 to Dose 2	**Dose 2 to Dose 3**	**Dose 3 to Dose 4**	**Dose 4 to Dose 5**
		4 weeks if the person is age 13 years or older			

Note: The above recommendations must be read along with the footnotes (see below).

Footnotes: Recommended Immunization Schedule for Persons Aged 0 Through 18 Years — United States, 2013

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) 1 to 2 months after completion of the HepB series, at age 9 through 18 months (preferably at the next well-child visit).
   - If mother's HBsAg status is unknown, within 12 hours of birth administer HepB vaccine to all infants regardless of birth weight. For infants weighing <2,000 grams, administer HBIG in addition to HepB within 12 hours of birth. Determine mother's HBsAg status as soon as possible and, if she is HBsAg-positive, also administer HBIG for infants weighing ≥2,000 grams (no later than age 1 week).

   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.

- The minimum interval between dose 1 and dose 2 is 4 weeks and between dose 2 and 3 is 8 weeks. The final (third or fourth) dose in the HepB vaccine series should be administered no earlier than age 24 weeks, and at least 16 weeks after the first dose.
- Administration of a total of 4 doses of HepB vaccine is recommended 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 issues, see "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, 2013".

2. **Rotavirus (RV) vaccines (Minimum age: 6 weeks for both RV-1 [Rotarix] and RV-5 [RotaTeq])**.

Routine vaccination:

- Administer a series of RV vaccine to all infants as follows:
    1. If RV-1 is used, administer a 2-dose series at 2 and 4 months of age
    2. If RV-5 is used, administer a 3-dose series at ages 2, 4, and 6 months
    3. If any dose in series was RV-5 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 days.
- Vaccination 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.
- If RV-1(Rotarix) is administered for the first and second doses, a third dose is not indicated.
- For other catch-up issues, see "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, 2013".

3. **Diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine (Minimum age: 6 weeks)**

Routine vaccination:

- Administer a 5-dose series of DTaP vaccine at ages 2, 4, 6, 15–18 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.

Catch-up vaccination:

- The fifth (booster) dose of DTaP vaccine is not necessary if the fourth dose was administered at age 4 years or older.

- For other catch-up issues, see "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, 2013".

4. **Tetanus and diphtheria toxoids and acellular pertussis (Tdap) vaccine (Minimum age: 10 years for Boostrix, 11 years for Adacel)**.

Routine Vaccination:

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

Catch-up Vaccination:

- Persons aged 7 through 10 years who are not fully immunized with the childhood DTaP vaccine series, should receive Tdap vaccine as the first dose in the catch-up series; if additional doses are needed, use Td vaccine. For these children, an adolescent Tdap vaccine should not be given.
- Persons aged 11 through 18 years who have not received Tdap vaccine should receive a dose followed by tetanus and diphtheria toxoids (Td) booster doses every 10 years thereafter.
- An inadvertent dose of DTaP vaccine administered to children aged 7 through 10 years can count as part of the catch-up series. This dose can count as the adolescent Tdap dose, or the child can later receive a Tdap booster dose at age 11–12 years.
- For other catch-up issues, see "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, 2013".

5. ***Haemophilus influenzae*** **type b (Hib) conjugate vaccine (Minimum age: 6 weeks)**

Routine vaccination:

- Administer a Hib vaccine primary series and a booster dose to all infants. The primary series doses should be administered at 2, 4, and 6 months of age; however, if PRP-OMP (PedvaxHib or Comvax) is administered at 2 and 4 months of age, a dose at age 6 months is not indicated. One booster dose should be administered at age 12 through 15 months.
- Hiberix (PRP-T) should only be used for the booster (final) dose in children aged 12 months through 4 years, who have received at least 1 dose of Hib.

Catch-up vaccination:

- If dose 1 was administered at ages 12-14 months, administer booster (as final dose) at least 8 weeks after dose 1.
- If the first 2 doses were PRP-OMP (PedvaxHIB or Comvax), and were administered at age 11 months or younger, the third (and final) dose should be administered at age 12 through 15 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 final dose at age 12 through 15 months, regardless of Hib vaccine (PRP-T or PRP-OMP) used for first dose.
- For unvaccinated children aged 15 months or older, administer only 1 dose.
- For other catch-up issues, see "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, 2013".

Vaccination of persons with high risk conditions:

- Hib vaccine is not routinely recommended for patients older than 5 years of age. However one dose of Hib vaccine should be administered to unvaccinated or partially vaccinated persons aged 5 years or older who have leukemia, malignant neoplasms, anatomic or functional asplenia (including sickle cell disease), human immunodeficiency virus (HIV) infection, or other immunocompromising conditions.

6a. **Pneumococcal conjugate vaccines (PCV) (Minimum age: 6 weeks)**

Routine vaccination:

- Administer a series of PCV13 vaccine at ages 2, 4, 6 months with a booster at age 12 through 15 months.
- For children aged 14 through 59 months who have received an age-appropriate series of 7-valent PCV (PCV7), administer a single supplemental dose of 13-valent PCV (PCV13).

Catch-up vaccination:

- Administer 1 dose of PCV13 to all healthy children aged 24 through 59 months who are not completely vaccinated for their age.
- For other catch-up issues, see "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, 2013".

Vaccination of persons with high-risk conditions:

- For children aged 24 through 71 months with certain underlying medical conditions (see footnote 6c), administer 1 dose of PCV13 if 3 doses of PCV were received previously, or administer 2 doses of PCV13 at least 8 weeks apart if fewer than 3 doses of PCV were received previously.
- A single dose of PCV13 may be administered to previously unvaccinated children aged 6 through 18 years who have anatomic or functional asplenia (including sickle cell disease), HIV infection or an immunocompromising condition, cochlear implant or cerebrospinal fluid leak.
- Administer PPSV23 at least 8 weeks after the last dose of PCV to children aged 2 years or older with certain underlying medical conditions (see footnotes 6b and 6c).

6b. **Pneumococcal polysaccharide vaccine (PPSV23) (Minimum age: 2 years)**

Vaccination of persons with high-risk conditions:

- Administer PPSV23 at least 8 weeks after the last dose of PCV to children aged 2 years or older with certain underlying medical conditions (see footnote 6c). A single revaccination with PPSV should be administered after 5 years to children with anatomic or functional asplenia (including sickle cell disease) or an immunocompromising condition.

6c. **Medical conditions for which PPSV23 is indicated in children aged 2 years and older and for which use of PCV13 is indicated in children aged 24 through 71 months**:

- Immunocompetent children with chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure); chronic lung disease (including asthma if treated with high-dose oral corticosteroid therapy), diabetes mellitus; cerebrospinal fluid leaks; or cochlear implant.
- Children with anatomic or functional asplenia (including sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, or splenic dysfunction).
- Children with immunocompromising conditions: HIV infection, chronic renal failure and nephrotic syndrome, diseases associated with treatment with immunosuppressive drugs or radiation therapy, including malignant neoplasms, leukemias, lymphomas and Hodgkin disease; or solid organ transplantation, congenital immunodeficiency.

7. **Inactivated poliovirus vaccine (IPV) (Minimum age: 6 weeks)**

   Routine vaccination:

   - Administer a series of IPV at ages 2, 4, 6–18 months, with a booster at age 4–6 years. The final dose in the series should be administered on or after the fourth birthday and at least 6 months after the previous dose.

   Catch-up vaccination:

   - In the first 6 months of life, minimum age and minimum intervals are only recommended if the person is at risk for imminent exposure to circulating poliovirus (i.e., travel to a polio-endemic region or during an outbreak).
   - If 4 or more doses are administered before age 4 years, an additional dose should be administered at age 4 through 6 years.
   - A fourth dose is not necessary if the third dose was administered at age 4 years or older and at least 6 months after the previous dose.
   - If both oral live poliovirus vaccine (OPV) and IPV were administered as part of a series, a total of 4 doses should be administered, regardless of the child's current age.
   - IPV is not routinely recommended for U.S. residents aged 18 years or older.

- For other catch-up issues, see "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, 2013".

8. **Influenza vaccines (Minimum age: 6 months for inactivated influenza vaccine [IIV]; 2 years for live, attenuated influenza vaccine [LAIV])**

   Routine vaccination:

   - Administer influenza vaccine annually to all children beginning at age 6 months. For most healthy, nonpregnant persons aged 2 through 49 years, either LAIV or IIV may be used. However, LAIV should NOT be administered to some persons, including 1) those with asthma, 2) children 2 through 4 years who had wheezing in the past 12 months, or 3) those who have any other underlying medical conditions that predispose them to influenza complications.
   - Administer 1 dose to persons aged 9 years and older.

   For children aged 6 months through 8 years:

   - For the 2012–13 season, administer 2 doses (separated by at least 4 weeks) to children who are receiving influenza vaccine for the first time.
   - For the 2013–14 season, follow dosing guidelines in the 2013 ACIP influenza vaccine recommendations.

9. **Measles, mumps, and rubella (MMR) vaccine (Minimum age: 12 months for routine vaccination)**

   Routine vaccination:

   - Administer the first dose of MMR vaccine at age 12 through 15 months, and the second dose at age 4 through 6 years. The second dose may be administered before age 4 years, provided at least 4 weeks have elapsed since the first dose.
   - Administer 1 dose of MMR vaccine to infants aged 6 through 11 months before departure from the United States for international travel. These children should be revaccinated with 2 doses of MMR vaccine, the first at age 12 through 15 months (12 months if the child remains in an area where disease risk is high), and the second dose at least 4 weeks later.
   - Administer 2 doses of MMR vaccine to children aged 12 months and older, before departure from the United States for international travel. The first dose should be administered on or after age 12 months and the second dose at least 4 weeks later.

   Catch-up vaccination:

   - Ensure that all school-aged children and adolescents have had 2 doses of MMR vaccine; the minimum interval between the 2 doses is 4 weeks.

10. **Varicella (VAR) vaccine (Minimum age: 12 months)**

Routine vaccination:

- Administer the first dose of VAR vaccine at age 12 through 15 months, and the second dose at age 4 through 6 years. The second dose may be administered before age 4 years, provided at least 3 months have elapsed since the first dose. If the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid.

Catch-up vaccination:

- Ensure that all persons aged 7 through 18 years without evidence of immunity have 2 doses of varicella vaccine. For children aged 7 through 12 years the recommended minimum interval between doses is 3 months (if the second dose was administered at least 4 weeks after the first dose, it can be accepted as valid); for persons aged 13 years and older, the minimum interval between doses is 4 weeks.

11. **Hepatitis A vaccine (HepA) (Minimum age: 12 months)**

Routine vaccination:

- Initiate the 2-dose HepA vaccine series for children aged 12 through 23 months; separate the 2 doses by 6 to 18 months.
- Children who have received 1 dose of HepA vaccine before age 24 months should receive a second dose 6 to 18 months after the first dose.
- For any person aged 2 years and older who has not already received the HepA vaccine series, 2 doses of HepA vaccine separated by 6 to 18 months may be administered if immunity against hepatitis A virus infection is desired.

Catch-up vaccination:

- The minimum interval between the two doses is 6 months.

Special populations:

- Administer 2 doses of HepA vaccine at least 6 months apart to previously unvaccinated persons who live in areas where vaccination programs target older children, or who are at increased risk for infection.

12. **Human papillomavirus (HPV) vaccine (HPV4 [Gardasil] and HPV2 [Cervarix]) (Minimum age: 9 years)**

Routine vaccination:

- Administer a 3-dose series of HPV vaccine on a schedule of 0, 1-2, and 6 months to all adolescents aged 11-12 years. Either HPV4 or HPV2 may be used for females, and only HPV4 may be used for males.
- The vaccine series can be started beginning at age 9 years.
- Administer the second dose 1 to 2 months after the first dose and the third dose 6 months after the first dose (at least 24 weeks after the first dose).

Catch-up vaccination:

- Administer the vaccine series to females (either HPV2 or HPV4) and males (HPV4) at age 13 through 18 years if not previously vaccinated.
- Use recommended routine dosing intervals (see above) for vaccine series catch-up.

13. **Meningococcal conjugate vaccines (MCV) (Minimum age: 6 weeks for Hib-MenCY, 9 months for Menactra [MCV4-D], 2 years for Menveo [MCV4-CRM])**

Routine vaccination:

- Administer MCV4 vaccine at age 11–12 years, with a booster dose at age 16 years.
- Adolescents aged 11 through 18 years with human immunodeficiency virus (HIV) infection should receive a 2-dose primary series of MCV4, with at least 8 weeks between doses.
- For children aged 2 months through 10 years with high-risk conditions, see below.

Catch-up vaccination:

- Administer MCV4 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 issues, see "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, 2013".

Vaccination of persons with high-risk conditions:

- For children younger than 19 months of age with anatomic or functional asplenia (including sickle cell disease), administer an infant series of Hib-MenCY at 2, 4, 6, and 12-15 months.
- For children aged 2 through 18 months with persistent complement component deficiency, administer either an infant series of Hib-MenCY at 2, 4, 6, and 12 through 15 months or a 2-dose primary series of MCV4-D starting at 9 months, with at least 8 weeks between doses. For children aged 19 through 23 months with persistent complement component deficiency who have not received a complete series of Hib-MenCY or MCV4-D, administer 2 primary doses of MCV4-D at least 8 weeks apart.
- For children aged 24 months and older with persistent complement component deficiency or anatomic or functional asplenia (including sickle cell disease), who have not received a complete series of Hib-MenCY or MCV4-D, administer 2 primary doses of either MCV4-

D or MCV4-CRM. If MCV4-D (Menactra) is administered to a child with asplenia (including sickle cell disease), do not administer MCV4-D until 2 years of age and at least 4 weeks after the completion of all PCV13 doses.

- For children aged 9 months and older who are residents of or travelers to countries in the African meningitis belt or to the Hajj, administer an age appropriate formulation and series of MCV4 for protection against serogroups A and W-135. Prior receipt of Hib-MenCY is not sufficient for children traveling to the meningitis belt or the Hajj.
- For children who are present during outbreaks caused by a vaccine serogroup, administer or complete an age and formulation-appropriate series of Hib-MenCY or MCV4.

These recommendations must be read with the footnotes that follow.

Vaccine ↓ / Age Group →	19-21 years	22-26 years	27-49 years	50-59 years	60-64 years	≥ 65 years
Influenza [2,*]	1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap) [3,*]	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Varicella [4,*]	2 doses					
Human papillomavirus (HPV) Female [5,*]	3 doses					
Human papillomavirus (HPV) Male [5,*]	3 doses					
Zoster [6]					1 dose	
Measles, mumps, rubella (MMR) [7,*]	1 or 2 doses					
Pneumococcal polysaccharide (PPSV23) [8,9]	1 or 2 doses					1 dose
Pneumococcal 13-valent conjugate (PCV13) [10,*]	1 dose					
Meningococcal [11,*]	1 or more doses					
Hepatitis A [12,*]	2 doses					
Hepatitis B [13,*]	3 doses					

*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster

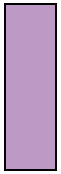
Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)

Not routinely recommended

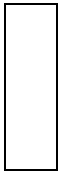
Vaccine Indication ⬇ ➡	Pregnancy	Immuno-compro-mising conditions (excluding human immuno-deficiency virus [HIV])	HIV infection CD4+ T lymph-ocyte count		Men who have sex with men (MSM)	Heart disease, chronic lung disease, chronic alcohol-ism	Asplenia (including elective splenectomy and persistent complement component deficiencies)	Chronic liver disease	Kidney failure, end-stage renal disease, receipt of hemo-dialysis	Dia-betes	Health-care personnel
			< 200 cells /µL	≥ 200 cells /µL							
Influenza [2,*]	1 dose IIV annually				1 dose IIV or LAIV annually	1 dose IIV annually					1 dose IIV or LAIV annually
Td/Tdap [3,*]	1 dose Tdap each pregnancy	Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs									
Varicella [4,*]	Contraindicated			2 doses							
HPV Female [5,*]		3 doses through age 26 yrs				3 doses through age 26 yrs					
HPV Male [5,*]		3 doses through age 26 yrs				3 doses through age 21 yrs					
Zoster [6]	Contraindicated				1 dose						
MMR [7,*]	Contraindicated			1 or 2 doses							
PPSV23[8,9]	1 or 2 doses	1 or 2 doses			1 or 2 doses	1 or 2 doses					1 or 2 doses
PCV13 [10,*]		1 dose			1 dose		1 dose	1 dose	1 dose	1 dose	
Meningococcal[11,*]	1 or more doses						1 or more doses	1 or more doses			
Hepatitis A [12,*]	2 doses				2 doses	2 doses		2 doses	2 doses		
Hepatitis B [13,*]	3 doses		3 doses			3 doses		3 doses			

*Covered by the Vaccine Injury Compensation Program

For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster



Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)



No recommendation

Footnotes:

1. **Influenza vaccination**

   - Annual vaccination against influenza is recommended for all persons aged 6 months and older.
   - Persons aged 6 months and older, including pregnant women, can receive the inactivated influenza vaccine (IIV).
   - Healthy, nonpregnant persons aged 2–49 years without high-risk medical conditions can receive either intranasally administered live, attenuated influenza vaccine (LAIV) (FluMist), or IIV. Health-care personnel who care for severely immunocompromised persons (i.e., those who require care in a protected environment) should receive IIV rather than LAIV.
   - The intramuscularly or intradermally administered IIV are options for adults aged 18–64 years.
   - Adults aged 65 years and older can receive the standard dose IIV or the high-dose IIV (Fluzone High-Dose).

2. **Diphtheria and tetanus toxoids and acellular pertussis (Td/Tdap) vaccine. (Minimum age: 6 weeks)**

    - Administer one dose of Tdap vaccine to pregnant women during each pregnancy (preferred during 27–36 weeks' gestation), regardless of number of years since prior Td or Tdap vaccination.
    - Administer Tdap to all other adults who have not previously received Tdap or for whom vaccine status is unknown. Tdap can be administered regardless of interval since the most recent tetanus or diphtheria-toxoid containing vaccine.
    - Adults with an unknown or incomplete history of completing a 3-dose primary vaccination series with Td-containing vaccines should begin or complete a primary vaccination series including a Tdap dose.
    - For unvaccinated adults, administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second.
    - For incompletely vaccinated (i.e., less than 3 doses) adults, administer remaining doses.

3. **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.
    - Special consideration for vaccination should be given to those who have close contact with persons at high risk for severe disease (e.g., health-care personnel and family contacts of persons with immunocompromising conditions) or are at high risk for exposure or transmission (e.g., teachers; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adolescents and adults living in households with children; nonpregnant women of childbearing age; and international travelers).
    - Pregnant women should be assessed for evidence of varicella immunity. Women who do not have evidence of immunity should receive the first dose of varicella vaccine upon completion or termination of pregnancy and before discharge from the health-care facility. The second dose should be administered 4–8 weeks after the first dose.
    - Evidence of immunity to varicella in adults includes any of the following:
        - documentation of 2 doses of varicella vaccine at least 4 weeks apart;

- U.S.-born before 1980 except health-care personnel and pregnant women;
- history of varicella based on diagnosis or verification of varicella disease by a health-care provider;
- history of herpes zoster based on diagnosis or verification of herpes zoster disease by a health-care provider; or
- laboratory evidence of immunity or laboratory confirmation of disease.

4. **Human papillomavirus (HPV) vaccination**

- Two vaccines are licensed for use in females, bivalent HPV vaccine (HPV2) and quadrivalent HPV vaccine (HPV4), and one HPV vaccine for use in males (HPV4).
- For females, either HPV4 or HPV2 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, HPV4 is recommended in a 3-dose series for routine vaccination at age 11 or 12 years, and for those aged 13 through 21 years, if not previously vaccinated. Males aged 22 through 26 years may be vaccinated.
- HPV4 is recommended for men who have sex with men (MSM) through age 26 years for those 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 for those who did not get any or all doses when they were younger.
- A complete series for either HPV4 or HPV2 consists of 3 doses. The second dose should be administered 1–2 months after the first dose; the third dose should be administered 6 months after the first dose (at least 24 weeks after the first dose).
- HPV vaccines are not recommended for use in pregnant women. However, pregnancy testing is not needed before vaccination. If a woman is found to be pregnant after initiating the vaccination series, no intervention is needed; the remainder of the 3-dose series should be delayed until completion of pregnancy.
- Although HPV vaccination is not specifically recommended for health-care personnel (HCP) based on their occupation, HCP should receive the HPV vaccine as recommended.

5. **Zoster vaccination**

- A single dose of zoster vaccine is recommended for adults aged 60 years and older regardless of whether they report a prior episode of herpes zoster. Although the vaccine is licensed by the Food and Drug Administration (FDA) for use among and can be administered to persons aged 50 years and older, ACIP recommends that vaccination begins at age 60 years.
- Persons aged 60 years and older with chronic medical conditions may be vaccinated unless their condition constitutes a contraindication, such as pregnancy or severe immunodeficiency.
- Although zoster vaccination is not specifically recommended for HCP, they should receive the vaccine if they are in the recommended age group.

6. **Measles, mumps, rubella (MMR) vaccination**

- Adults born before 1957 generally are considered immune to measles and mumps. All adults born in 1957 or later should have documentation of 1 or more doses of MMR vaccine unless they have a medical contraindication to the vaccine, or laboratory evidence of immunity to each of the three diseases. Documentation of provider-diagnosed disease is not considered acceptable evidence of immunity for measles, mumps, or rubella.

Measles component:

- A routine second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who
  - are students in postsecondary educational institutions;
  - work in a health-care facility; or
  - plan to travel internationally.
- Persons who received inactivated (killed) measles vaccine or measles vaccine of unknown type during 1963–1967 should be revaccinated with 2 doses of MMR vaccine.

Mumps component:

- A routine second dose of MMR vaccine, administered a minimum of 28 days after the first dose, is recommended for adults who
    - are students in a postsecondary educational institution;
    - work in a health-care facility; or
    - plan to travel internationally.
- Persons vaccinated before 1979 with either killed mumps vaccine or mumps vaccine of unknown type who are at high risk for mumps infection (e.g., persons who are working in a health-care facility) should be considered for revaccination with 2 doses of MMR vaccine.

Rubella component:

- For women of childbearing age, regardless of birth year, rubella immunity should be determined. If there is no evidence of immunity, women who are not pregnant should be vaccinated. Pregnant women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the health-care facility.

HCP born before 1957:

- For unvaccinated health-care personnel born before 1957 who lack laboratory evidence of measles, mumps, and/or rubella immunity or laboratory confirmation of disease, health-care facilities should consider vaccinating personnel with 2 doses of MMR vaccine at the appropriate interval for measles and mumps or 1 dose of MMR vaccine for rubella.

7. **Pneumococcal polysaccharide (PPSV23) vaccination**

- Vaccinate all persons with the following indications:
    - all adults aged 65 years and older;
    - adults younger than age 65 years with chronic lung disease (including chronic obstructive pulmonary disease, emphysema, and asthma); chronic cardiovascular diseases; diabetes mellitus; chronic renal failure; nephrotic syndrome; chronic liver disease (including cirrhosis); alcoholism; cochlear implants; cerebrospinal fluid leaks; immunocompromising conditions; and functional or anatomic asplenia (e.g., sickle cell disease and other hemoglobinopathies, congenital or acquired asplenia, splenic dysfunction, or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]);
    - residents of nursing homes or long-term care facilities; and
    - adults who smoke cigarettes.
- Persons with immunocompromising conditions and other selected conditions are recommended to receive PCV13 and PPSV23 vaccines. See footnote #9 for information on timing of PCV13 and PPSV23 vaccinations.
- Persons with asymptomatic or symptomatic HIV infection should be vaccinated as soon as possible after their diagnosis.
- When cancer chemotherapy or other immunosuppressive therapy is being considered, the interval between vaccination and initiation of immunosuppressive therapy should be at least 2 weeks. Vaccination during chemotherapy or radiation therapy should be avoided.
- Routine use of PPSV23 is not recommended for American Indians/Alaska Natives or other persons younger than age 65 years unless they have underlying medical conditions that are PPSV23 indications. However, public health authorities may consider recommending PPSV23 for American Indians/Alaska Natives who are living in areas where the risk for invasive pneumococcal disease is increased.
- When indicated, PPSV23 should be administered to patients who are uncertain of their vaccination status and there is no record of previous vaccination. When PCV13 is also indicated, a dose of PCV13 should be given first (see footnote #9).

8. **Revaccination with PPSV23**

- One-time revaccination 5 years after the first dose is recommended for persons aged 19 through 64 years with chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); and for persons with immunocompromising conditions.
- Persons who received 1 or 2 doses of PPSV23 before age 65 years for any indication should receive another dose of the vaccine at age 65 years or later if at least 5 years have passed since their previous dose.
- No further doses are needed for persons vaccinated with PPSV23 at or after age 65 years.

9. **Pneumococcal conjugate 13-valent vaccination (PCV13)**

- Adults aged 19 years or older with immunocompromising conditions (including chronic renal failure and nephrotic syndrome), functional or anatomic asplenia, CSF leaks or cochlear implants, and who have not previously received PCV13 or PPSV23 should receive a single dose of PCV13 followed by a dose of PPSV23 at least 8 weeks later.
- Adults aged 19 years or older with the aforementioned conditions who have previously received one or more doses of PPSV23 should receive a dose of PCV13 one or more years after the last PPSV23 dose was received. For those that require additional doses of PPSV23, the first such dose should be given no sooner than 8 weeks after PCV13 and at least 5 years since the most recent dose of PPSV23.
- When indicated, PCV13 should be administered to patients who are uncertain of their vaccination status history and there is no record of previous vaccination.
- Although PCV13 is licensed by the Food and Drug Administration (FDA) for use among and can be administered to persons aged 50 years and older, ACIP recommends PCV13 for adults aged 19 years and older with the specific medical conditions noted above.

10. **Meningococcal vaccination**

- Administer 2 doses of meningococcal conjugate vaccine quadrivalent (MCV4) at least 2 months apart to adults with functional asplenia or persistent complement component deficiencies.
- HIV-infected persons who are vaccinated also should receive 2 doses.
- Administer a single dose of meningococcal vaccine to microbiologists routinely exposed to isolates of Neisseria meningitidis, military recruits, and persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic.
- First-year college students up through age 21 years who are living in residence halls should be vaccinated if they have not received a dose on or after their 16th birthday.
- MCV4 is preferred for adults with any of the preceding indications who are aged 55 years and younger; meningococcal polysaccharide vaccine (MPSV4) is preferred for adults aged 56 years and older.
- Revaccination with MCV4 every 5 years is recommended for adults previously vaccinated with MCV4 or MPSV4 who remain at increased risk for infection (e.g., adults with anatomic or functional asplenia or persistent complement component deficiencies).

11. **Hepatitis A vaccination**

- Vaccinate any person seeking protection from hepatitis A virus (HAV) infection and persons with any of the following indications:
    - men who have sex with men and persons who use injection or noninjection illicit drugs;
    - persons working with HAV-infected primates or with HAV in a research laboratory setting;
    - persons with chronic liver disease and persons who receive clotting factor concentrates;
    - persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A; and
    - unvaccinated persons who anticipate close personal contact (e.g., household or regular babysitting) with an international adoptee during the first 60 days after arrival in the United States from a country with high or intermediate endemicity. The first dose of the 2-dose hepatitis A vaccine series should be administered as soon as adoption is planned, ideally 2 or more weeks before the arrival of the adoptee.

- Single-antigen vaccine formulations should be administered in a 2-dose schedule at either 0 and 6–12 months (Havrix), or 0 and 6–18 months (Vaqta). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, administer 3 doses at 0, 1, and 6 months; alternatively, a 4-dose schedule may be used, administered on days 0, 7, and 21–30, followed by a booster dose at month 12.

12. **Hepatitis B vaccination**

- Vaccinate persons with any of the following indications and any person seeking protection from hepatitis B virus (HBV) infection:
    - sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than one sex partner during the previous 6 months); persons seeking evaluation or treatment for a sexually transmitted disease (STD); current or recent injection-drug users; and men who have sex with men;
    - health-care personnel and public-safety workers who are potentially exposed to blood or other infectious body fluids;
    - persons with diabetes younger than age 60 years as soon as feasible after diagnosis; persons with diabetes who are age 60 years or older at the discretion of the treating clinician based on increased need for assisted blood glucose monitoring in long-term care facilities, likelihood of acquiring hepatitis B infection, its complications or chronic sequelae, and likelihood of immune response to vaccination;
    - persons with end-stage renal disease, including patients receiving hemodialysis; persons with HIV infection; and persons with chronic liver disease;
    - household contacts and sex partners of hepatitis B surface antigenpositive persons; clients and staff members of institutions for persons with developmental disabilities; and international travelers to countries with high or intermediate prevalence of chronic HBV infection; and
    - all adults in the following settings: STD treatment facilities; HIV testing and treatment facilities; facilities providing drug-abuse treatment and prevention services; health-care settings targeting services to injection-drug users or men who have sex with men; correctional facilities; end-stage renal disease programs and facilities for chronic hemodialysis patients; and institutions and nonresidential daycare facilities for persons with developmental disabilities.
- Administer missing doses to complete a 3-dose series of hepatitis B vaccine to those persons not vaccinated or not completely vaccinated. The second dose should be administered 1 month after the first dose; the third dose should be given at least 2 months

after the second dose (and at least 4 months after the first dose). If the combined hepatitis A and hepatitis B vaccine (Twinrix) is used, give 3 doses at 0, 1, and 6 months; alternatively, a 4-dose Twinrix schedule, administered on days 0, 7, and 21–30 followed by a booster dose at month 12 may be used.

- Adult patients receiving hemodialysis or with other immunocompromising conditions should receive 1 dose of 40 µg/mL (Recombivax HB) administered on a 3-dose schedule at 0, 1, and 6 months or 2 doses of 20 µ/mL (Engerix-B) administered simultaneously on a 4-dose schedule at 0, 1, 2, and 6 months.

13. **Selected conditions for which *Haemophilus influenzae* type b (Hib) vaccine may be used**

- 1 dose of Hib vaccine should be considered for persons who have sickle cell disease, leukemia, or HIV infection, or who have anatomic or functional asplenia if they have not previously received Hib vaccine.

14. **Immunocompromising conditions**

- Inactivated vaccines generally are acceptable (e.g., pneumococcal, meningococcal, and influenza [inactivated influenza vaccine]), and live vaccines generally are avoided in persons with immune deficiencies or immunocompromising conditions.
- This schedule indicates the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly indicated for adults ages 19 years and older, as of January 1, 2013. 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**. 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.

Contraindications and Precautions to Commonly Used Vaccines in Adults

These recommendations must be read with the footnotes that follow.

Vaccine	Contraindications	Precautions
Influenza, inactivated vaccine (IIV)	Severe allergic reaction (e.g., anaphylaxis) after previous dose of any influenza vaccine or to a vaccine component, including egg protein.	Moderate or severe acute illness with or without fever. History of Guillain-Barré Syndrome (GBS) within 6 weeks of previous influenza vaccination. Persons who experience only hives with exposure to eggs should receive IIV with additional safety precautions.
Influenza, live attenuated (LAIV)[3]	Severe allergic reaction (e.g., anaphylaxis) after previous dose of any influenza vaccine or to a vaccine component, including egg protein. Conditions for which the Advisory Committee on Immunization Practices (ACIP) recommends against use, but which are not contraindications in vaccine package insert: immune suppression, certain chronic medical conditions such as asthma, diabetes, heart or kidney disease. and pregnancy.	Moderate or severe acute illness with or without fever. History of GBS within 6 weeks of previous influenza vaccination. Receipt of specific antivirals (i.e., amantadine, rimantadine, zanamivir, or oseltamivir) 48 hours before vaccination. Avoid use of these antiviral drugs for 14 days after vaccination.
Tetanus, diphtheria, pertussis (Tdap); tetanus, diphtheria (Td)	Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component. For pertussis-containing vaccines: encephalopathy (e.g., coma,	Moderate or severe acute illness with or without fever. GBS within 6 weeks after a previous dose of tetanus toxoid– containing vaccine. History of arthus-type

	decreased level of consciousness, or prolonged seizures) not attributable to another identifiable cause within 7 days of administration of a previous dose of Tdap or diphtheria and tetanus toxoids and pertussis (DTP) or diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccine.	hypersensitivity reactions after a previous dose of tetanus or diptheria toxoid–containing vaccine; defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine. For pertussis-containing vaccines: progressive or unstable neurologic disorder, uncontrolled seizures, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized.
Varicella[2]	Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component. 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). Pregnancy.	Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product). Moderate or severe acute illness with or without fever. 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.
Human papillomavirus (HPV)	Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component.	Moderate or severe acute illness with or without fever. Pregnancy.
Zoster	Severe allergic reaction (e.g., anaphylaxis) to a vaccine component. Known severe immunodeficiency (e.g., from hematologic and solid tumors, receipt of chemotherapy, or long-term immunosuppressive therapy or	Moderate or severe acute illness with or without fever. Receipt of specific antivirals (i.e., acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination; avoid use of these antiviral drugs for 14 days after

	patients with HIV infection who are severely immunocompromised). Pregnancy.	vaccination.
Measles, mumps, rubella (MMR)[3]	Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component. 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). Pregnancy.	Moderate or severe acute illness with or without fever. Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product). History of thrombocytopenia or thrombocytopenic purpura. Need for tuberculin skin testing.
Pneumococcal polysaccharide (PPSV)	Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component.	Moderate or severe acute illness with or without fever.
Pneumococcal conjugate (PCV13)	Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component, including to any vaccine containing diphtheria toxoid.	Moderate or severe acute illness with or without fever.
Meningococcal, conjugate, (MCV4); meningococcal, polysaccharide (MPSV4)	Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component.	Moderate or severe acute illness with or without fever.
Hepatitis A (HepA)	Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component.	Moderate or severe acute illness with or without fever.
Hepatitis B (HepB)	Severe allergic reaction (e.g., anaphylaxis) after a previous dose or to a vaccine component.	Moderate or severe acute illness with or without fever.

Footnotes

Contraindications and Precautions to Commonly Used Vaccines in Adults

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 excipients. Events or conditions listed as precautions should be reviewed carefully. Benefits of 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 is a condition in a recipient that increases the chance of a serious adverse reaction. Therefore, a vaccine should not be administered when a contraindication is present.

2. LAIV, MMR, and varicella vaccines can be administered on the same day. If not administered on the same day, these live vaccines should be separated by at least 28 days.

3. Immunosuppressive steroid dose is considered to be 2 or more weeks of daily receipt of 20 mg prednisone or the 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.

4. Vaccine should be deferred for the appropriate interval if replacement immune globulin products are being administered.

5. 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.

References:

1- Iyabode Akinsanya , Renée Jenkins , H. Cody Meissner .Advisory Committee on Immunization Practices (ACIP) Recommended Immunization Schedule for Persons Aged 0 Through 18 Years — United States**,** February 1, 2013 / 62(01);2-8. http://www.cdc.gov/mmwr/preview/mmwrhtml/su6201a2.htm
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