



NEW YORK CITY DEPARTMENT OF
HEALTH AND MENTAL HYGIENE
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Dear Colleague:

The Centers for Disease Control and Prevention (CDC) has released the 2018 Recommended Immunization Schedules. These schedules and footnotes, which are meant to be used together, are attached here.

The schedules and summaries of changes to the schedules are available on the CDC website, at <https://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html> and <https://www.cdc.gov/vaccines/schedules/hcp/adult.html> (on each website, there is an “On This Page” box at the top with links to the schedule and the changes). Please note the following key changes:

For children and adolescents:

Infants <2,000 grams born to HBsAg-negative mothers should receive 1 dose of HepB vaccine at chronological age 1 month or at hospital discharge. Only trivalent oral polio vaccine (tOPV) counts towards the polio requirements. For guidance to assess doses documented as “OPV,” see https://www.cdc.gov/mmwr/volumes/66/wr/mm6606a7.htm?s_cid=mm6606a7_w.

For adults:

Administer 2 doses of recombinant zoster vaccine (RZV) (Shingrix[®]) to immunocompetent adults 50 years of age or older 2-6 months apart regardless of past episode of herpes zoster or receipt of zoster vaccine live (ZVL) (Zostavax[®]). If ZVL was previously received, begin RZV series at least 2 months after ZVL. For complete Advisory Committee on Immunization Practices (ACIP) recommendations on RZV, see <https://www.cdc.gov/mmwr/volumes/67/wr/mm6703a5.htm>.

Recommendations from ACIP are considered the standard of immunization practice in the United States, even if not included in the package insert. Vaccines should always be administered in accordance with current CDC and ACIP recommendations.

For questions on the new immunization schedules, or any other vaccine-related issue, please contact (347) 396-2400 or email nycimmunize@health.nyc.gov. Thank you for keeping NYC children safe from vaccine-preventable diseases.

Sincerely,

Jane R. Zucker, MD, MSc

Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger, UNITED STATES, 2018

- Consult relevant ACIP statements for detailed recommendations (www.cdc.gov/vaccines/hcp/acip-recs/index.html).
- When a vaccine is not administered at the recommended age, administer at a subsequent visit.
- Use combination vaccines instead of separate injections when appropriate.
- Report clinically significant adverse events to the Vaccine Adverse Event Reporting System (VAERS) online (www.vaers.hhs.gov) or by telephone (800-822-7967).
- Report suspected cases of reportable vaccine-preventable diseases to your state or local health department.
- For information about precautions and contraindications, see www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html.

Approved by the

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

American Academy of Pediatrics
(www.aap.org)

American Academy of Family Physicians
(www.aafp.org)

American College of Obstetricians and Gynecologists
(www.acog.org)

This schedule includes recommendations in effect as of January 1, 2018.

The table below shows vaccine acronyms, and brand names for vaccines routinely recommended for children and adolescents. The use of trade names in this immunization schedule is for identification purposes only and does not imply endorsement by the ACIP or CDC.

Vaccine type	Abbreviation	Brand(s)
Diphtheria, tetanus, and acellular pertussis vaccine	DTaP	Daptacel Infanrix
Diphtheria, tetanus vaccine	DT	No Trade Name
<i>Haemophilus influenzae</i> type B vaccine	Hib (PRP-T) Hib (PRP-OMP)	ActHIB Hiberix PedvaxHIB
Hepatitis A vaccine	HepA	Havrix Vaqta
Hepatitis B vaccine	HepB	Engerix-B Recombivax HB
Human papillomavirus vaccine	HPV	Gardasil 9
Influenza vaccine (inactivated)	IIV	Multiple
Measles, mumps, and rubella vaccine	MMR	M-M-R II
Meningococcal serogroups A, C, W, Y vaccine	MenACWY-D MenACWY-CRM	Menactra Menveo
Meningococcal serogroup B vaccine	MenB-4C MenB-FHbp	Bexsero Trumenba
Pneumococcal 13-valent conjugate vaccine	PCV13	Prevnar 13
Pneumococcal 23-valent polysaccharide vaccine	PPSV23	Pneumovax
Poliovirus vaccine (inactivated)	IPV	IPOLE
Rotavirus vaccines	RV1 RV5	Rotarix RotaTeq
Tetanus, diphtheria, and acellular pertussis vaccine	Tdap	Adacel Boostrix
Tetanus and diphtheria vaccine	Td	Tenivac No Trade Name
Varicella vaccine	VAR	Varivax
Combination Vaccines		
DTaP, hepatitis B and inactivated poliovirus vaccine	DTaP-HepB-IPV	Pediarix
DTaP, inactivated poliovirus and <i>Haemophilus influenzae</i> type B vaccine	DTaP-IPV/Hib	Pentacel
DTaP and inactivated poliovirus vaccine	DTaP-IPV	Kinrix Quadracel
Measles, mumps, rubella, and varicella vaccines	MMRV	ProQuad



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

Figure 1. Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger—United States, 2018.

(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 in gray.

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 yrs	17-18 yrs	
Hepatitis B ¹ (HepB)	1 st dose	←-----2 nd dose-----→		←-----3 rd dose-----→														
Rotavirus ² (RV) RV1 (2-dose series); RV5 (3-dose series)			1 st dose	2 nd dose	See footnote 2													
Diphtheria, tetanus, & acellular pertussis ³ (DTaP: <7 yrs)			1 st dose	2 nd dose	3 rd dose				←-----4 th dose-----→			5 th dose						
<i>Haemophilus influenzae</i> type b ⁴ (Hib)			1 st dose	2 nd dose	See footnote 4		←-----3 rd or 4 th dose,-----→ See footnote 4											
Pneumococcal conjugate ⁵ (PCV13)			1 st dose	2 nd dose	3 rd dose				←-----4 th dose-----→									
Inactivated poliovirus ⁶ (IPV: <18 yrs)			1 st dose	2 nd dose	←-----3 rd dose-----→						4 th dose							
Influenza ⁷ (IIV)						Annual vaccination (IIV) 1 or 2 doses							Annual vaccination (IIV) 1 dose only					
Measles, mumps, rubella ⁸ (MMR)					See footnote 8			←-----1 st dose-----→				2 nd dose						
Varicella ⁹ (VAR)							←-----1 st dose-----→				2 nd dose							
Hepatitis A ¹⁰ (HepA)							←-----2-dose series, See footnote 10-----→											
Meningococcal ¹¹ (MenACWY-D ≥9 mos; MenACWY-CRM ≥2 mos)				See footnote 11									1 st dose	2 nd dose				
Tetanus, diphtheria, & acellular pertussis ¹³ (Tdap: ≥7 yrs)													Tdap					
Human papillomavirus ¹⁴ (HPV)														See footnote 14				
Meningococcal B ¹²															See footnote 12			
Pneumococcal polysaccharide ⁵ (PPSV23)											See footnote 5							

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

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

FIGURE 2. Catch-up immunization schedule for persons aged 4 months–18 years who start late or who are more than 1 month behind—United States, 2018.

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.

Children age 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 Maximum age for first dose is 14 weeks, 6 days	4 weeks	4 weeks ² Maximum age for final dose is 8 months, 0 days.		
Diphtheria, tetanus, and acellular pertussis ³	6 weeks	4 weeks	4 weeks	6 months	6 months ³
<i>Haemophilus influenzae</i> type b ⁴	6 weeks	4 weeks if first dose was administered before the 1 st birthday. 8 weeks (as final dose) if first dose was administered at age 12 through 14 months. No further doses needed if first dose was administered at age 15 months or older.	4 weeks ⁴ if current age is younger than 12 months and first dose was administered at younger than age 7 months, and at least 1 previous dose was PRP-T (ActHib, Pentacel, Hiberix) or unknown. 8 weeks and age 12 through 59 months (as final dose) ⁴ • if current age is younger than 12 months and first dose was administered at age 7 through 11 months; OR • if current age is 12 through 59 months and first dose was administered before the 1 st birthday, and second dose administered at younger than 15 months; OR • if both doses were PRP-OMP (PedvaxHIB; Comvax) and were administered before the 1 st birthday. No further doses needed if previous dose was administered at age 15 months or older.	8 weeks (as final dose) This dose only necessary for children age 12 through 59 months who received 3 doses before the 1 st birthday.	
Pneumococcal conjugate ⁵	6 weeks	4 weeks if first dose administered before the 1 st birthday. 8 weeks (as final dose for healthy children) if first dose was administered at the 1 st birthday or after. No further doses needed for healthy children if first dose was administered at age 24 months or older.	4 weeks if current age is younger than 12 months and previous dose given at <7 months old. 8 weeks (as final dose for healthy children) if previous dose given between 7-11 months (wait until at least 12 months old); OR if current age is 12 months or older and at least 1 dose was given before age 12 months. 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 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 ⁶	6 weeks	4 weeks ⁶	4 weeks ⁶ if current age is < 4 years 6 months (as final dose) if current age is 4 years or older	6 months ⁶ (minimum age 4 years for final dose).	
Measles, mumps, rubella ⁸	12 months	4 weeks			
Varicella ⁹	12 months	3 months			
Hepatitis A ¹⁰	12 months	6 months			
Meningococcal ¹¹ (MenACWY-D ≥9 mos; MenACWY-CRM ≥2 mos)	6 weeks	8 weeks ¹¹	See footnote 11	See footnote 11	
Children and adolescents age 7 through 18 years					
Meningococcal ¹¹ (MenACWY-D ≥9 mos; MenACWY-CRM ≥2 mos)	Not Applicable (N/A)	8 weeks ¹¹			
Tetanus, diphtheria; tetanus, diphtheria, and acellular pertussis ³	7 years ¹³	4 weeks	4 weeks if first dose of DTaP/DT was administered before the 1 st birthday. 6 months (as final dose) if first dose of DTaP/DT or Tdap/Td was administered at or after the 1 st birthday.	6 months if first dose of DTaP/DT was administered before the 1 st birthday.	
Human papillomavirus ¹⁴	9 years		Routine dosing intervals are recommended. ¹⁴		
Hepatitis A ¹⁰	N/A	6 months			
Hepatitis B ¹	N/A	4 weeks	8 weeks and at least 16 weeks after first dose.		
Inactivated poliovirus ⁶	N/A	4 weeks	6 months ⁶ 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.	A fourth dose of IPV is indicated if all previous doses were administered at <4 years or if the third dose was administered <6 months after the second dose.	
Measles, mumps, rubella ⁸	N/A	4 weeks			
Varicella ⁹	N/A	3 months if younger than age 13 years. 4 weeks if age 13 years or older.			

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

Figure 3. Vaccines that might be indicated for children and adolescents aged 18 years or younger based on medical indications

VACCINE ▼	INDICATION ►	Pregnancy	Immunocompromised status (excluding HIV infection)	HIV infection CD4+ count ¹		Kidney failure, end-stage renal disease, on hemodialysis	Heart disease, chronic lung disease	CSF leaks/ cochlear implants	Asplenia and persistent complement component deficiencies	Chronic liver disease	Diabetes
				<15% or total CD4 cell count of <200/mm ³	≥15% or total CD4 cell count of ≥200/mm ³						
Hepatitis B ¹											
Rotavirus ²			SCID*								
Diphtheria, tetanus, & acellular pertussis ³ (DTaP)											
<i>Haemophilus influenzae</i> type b ⁴											
Pneumococcal conjugate ⁵											
Inactivated poliovirus ⁶											
Influenza ⁷											
Measles, mumps, rubella ⁸											
Varicella ⁹											
Hepatitis A ¹⁰											
Meningococcal ACWY ¹¹											
Tetanus, diphtheria, & acellular pertussis ¹³ (Tdap)											
Human papillomavirus ¹⁴											
Meningococcal B ¹²											
Pneumococcal polysaccharide ⁵											

Vaccination according to the routine schedule recommended
 Recommended for persons with an additional risk factor for which the vaccine would be indicated
 Vaccination is recommended, and additional doses may be necessary based on medical condition. See footnotes.
 No recommendation
 Contraindicated
 Precaution for vaccination

*Severe Combined Immunodeficiency
¹For additional information regarding HIV laboratory parameters and use of live vaccines; see the General Best Practice Guidelines for Immunization "Altered Immunocompetence" at: www.cdc.gov/vaccines/hcp/acip-recs/general-recs/immunocompetence.html; and Table 4-1 (footnote D) at: www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html.

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

Footnotes — Recommended Immunization Schedule for Children and Adolescents Aged 18 Years or Younger, UNITED STATES, 2018

For further guidance on the use of the vaccines mentioned below, see: 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 information on contraindications and precautions for the use of a vaccine, consult the *General Best Practice Guidelines for Immunization* and relevant ACIP statements, at www.cdc.gov/vaccines/hcp/acip-recs/index.html.
- For calculating intervals between doses, 4 weeks = 28 days. Intervals of ≥ 4 months are determined by calendar months.
- Within a number range (e.g., 12–18), a dash (–) should be read as “through.”
- Vaccine doses administered ≤ 4 days before the minimum age or 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 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 Table 3-1, *Recommended and minimum ages and intervals between vaccine doses*, in *General Best Practice Guidelines for Immunization* at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timing.html.
- Information on travel vaccine requirements and recommendations is available at wwwnc.cdc.gov/travel/.
- For vaccination of persons with immunodeficiencies, see Table 8-1, *Vaccination of persons with primary and secondary immunodeficiencies*, in *General Best Practice Guidelines for Immunization*, at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/immunocompetence.html; and Immunization in Special Clinical Circumstances. (In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. *Red Book: 2015 report of the Committee on Infectious Diseases*. 30th ed. Elk Grove Village, IL: American Academy of Pediatrics, 2015:68-107).
- The National Vaccine Injury Compensation Program (VICP) is a no-fault alternative to the traditional legal system for resolving vaccine injury claims. All routine child and adolescent vaccines are covered by VICP except for pneumococcal polysaccharide vaccine (PPSV23). For more information; see www.hrsa.gov/vaccinecompensation/index.html.

1. Hepatitis B (HepB) vaccine. (minimum age: birth)

Birth Dose (Monovalent HepB vaccine only):

- **Mother is HBsAg-Negative:** 1 dose within 24 hours of birth for medically stable infants $\geq 2,000$ grams. Infants $< 2,000$ grams administer 1 dose at chronological age 1 month or hospital discharge.
- **Mother is HBsAg-Positive:**
 - Give **HepB vaccine** and **0.5 mL of HBIG** (at separate anatomic sites) within 12 hours of birth, regardless of birth weight.
 - Test for HBsAg and anti-HBs at age 9–12 months. If HepB series is delayed, test 1–2 months after final dose.
- **Mother’s HBsAg status is unknown:**
 - Give **HepB vaccine** within 12 hours of birth, regardless of birth weight.
 - For infants $< 2,000$ grams, give **0.5 mL of HBIG** in addition to HepB vaccine within 12 hours of birth.
 - Determine mother’s HBsAg status as soon as possible. If mother is HBsAg-positive, give **0.5 mL of HBIG** to infants $\geq 2,000$ grams as soon as possible, but no later than 7 days of age.

Routine Series:

- A complete series is 3 doses at 0, 1–2, and 6–18 months. (Monovalent HepB vaccine should be used for doses given before age 6 weeks.)

- Infants who did not receive a birth dose should begin the series as soon as feasible (see Figure 2).
- Administration of **4 doses** is permitted when a combination vaccine containing HepB is used after the birth dose.
- **Minimum age** for the final (3rd or 4th) dose: 24 weeks.
- **Minimum Intervals:** Dose 1 to Dose 2: 4 weeks / Dose 2 to Dose 3: 8 weeks / Dose 1 to Dose 3: 16 weeks. (When 4 doses are given, substitute “Dose 4” for “Dose 3” in these calculations.)

Catch-up vaccination:

- Unvaccinated persons should complete a 3-dose series at 0, 1–2, and 6 months.
- Adolescents 11–15 years of age may use an alternative 2-dose schedule, with at least 4 months between doses (adult formulation **Recombivax HB** only).
- For other catch-up guidance, see Figure 2.

2. Rotavirus vaccines. (minimum age: 6 weeks)

Routine vaccination:

Rotarix: 2-dose series at 2 and 4 months.

RotaTeq: 3-dose series at 2, 4, and 6 months.

If any dose in the series is either RotaTeq or unknown, default to 3-dose series.

Catch-up vaccination:

- Do not start the series on or after age 15 weeks, 0 days.
- The maximum age for the final dose is 8 months, 0 days.
- For other catch-up guidance, see Figure 2.

3. Diphtheria, tetanus, and acellular pertussis (DTaP) vaccine. (minimum age: 6 weeks [4 years for Kinrix or Quadracel])

Routine vaccination:

- 5-dose series at 2, 4, 6, and 15–18 months, and 4–6 years.
 - **Prospectively:** A 4th dose may be given as early as age 12 months if at least 6 months have elapsed since the 3rd dose.
 - **Retrospectively:** A 4th dose that was inadvertently given as early as 12 months may be counted if at least 4 months have elapsed since the 3rd dose.

Catch-up vaccination:

- The 5th dose is not necessary if the 4th dose was administered at 4 years or older.
- For other catch-up guidance, see Figure 2.

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

4. ***Haemophilus influenzae* type b (Hib) vaccine.** (minimum age: 6 weeks)

Routine vaccination:

- **ActHIB, Hiberix, or Pentacel:** 4-dose series at 2, 4, 6, and 12–15 months.
- **PedvaxHIB:** 3-dose series at 2, 4, and 12–15 months.

Catch-up vaccination:

- **1st dose at 7–11 months:** Give 2nd dose at least 4 weeks later and 3rd (final) dose at 12–15 months or 8 weeks after 2nd dose (whichever is later).
- **1st dose at 12–14 months:** Give 2nd (final) dose at least 8 weeks after 1st dose.
- **1st dose before 12 months and 2nd dose before 15 months:** Give 3rd (final) dose 8 weeks after 2nd dose.
- **2 doses of PedvaxHIB before 12 months:** Give 3rd (final) dose at 12–59 months and at least 8 weeks after 2nd dose.
- **Unvaccinated at 15–59 months:** 1 dose.
- For other catch-up guidance, see Figure 2.

Special Situations:

• **Chemotherapy or radiation treatment**

12–59 months

- o Unvaccinated or only 1 dose before 12 months: Give 2 doses, 8 weeks apart
- o 2 or more doses before 12 months: Give 1 dose, at least 8 weeks after previous dose.

Doses given within 14 days of starting therapy or during therapy should be repeated at least 3 months after therapy completion.

• **Hematopoietic stem cell transplant (HSCT)**

- 3-dose series with doses 4 weeks apart starting 6 to 12 months after successful transplant (regardless of Hib vaccination history).

• **Anatomic or functional asplenia (including sickle cell disease)**

12–59 months

- o Unvaccinated or only 1 dose before 12 months: Give 2 doses, 8 weeks apart.
- o 2 or more doses before 12 months: Give 1 dose, at least 8 weeks after previous dose.

Unimmunized* persons 5 years or older

- o Give 1 dose

• **Elective splenectomy**

Unimmunized* persons 15 months or older

- o Give 1 dose (preferably at least 14 days before procedure).

• **HIV infection**

12–59 months

- o Unvaccinated or only 1 dose before 12 months: Give 2 doses 8 weeks apart.
- o 2 or more doses before 12 months: Give 1 dose, at least 8 weeks after previous dose.

Unimmunized* persons 5–18 years

- o Give 1 dose

• **Immunoglobulin deficiency, early component complement deficiency**

12–59 months

- o Unvaccinated or only 1 dose before 12 months: Give 2 doses, 8 weeks apart.
- o 2 or more doses before 12 months: Give 1 dose, at least 8 weeks after previous dose.

**Unimmunized = Less than routine series (through 14 months) OR no doses (14 months or older)*

5. **Pneumococcal vaccines. (minimum age: 6 weeks [PCV13], 2 years [PPSV23])**

Routine vaccination with PCV13:

- 4-dose series at 2, 4, 6, and 12–15 months.

Catch-up vaccination with PCV13:

- 1 dose for healthy children aged 24–59 months with any incomplete* PCV13 schedule
- For other catch-up guidance, see Figure 2.

Special situations: High-risk conditions:

Administer PCV13 doses before PPSV23 if possible.

Chronic heart disease (particularly cyanotic congenital heart disease and cardiac failure); chronic lung disease (including asthma treated with high-dose, oral, corticosteroids); diabetes mellitus:

Age 2–5 years:

- Any incomplete* schedules with:
 - o 3 PCV13 doses: 1 dose of PCV13 (at least 8 weeks after any prior PCV13 dose).
 - o <3 PCV13 doses: 2 doses of PCV13, 8 weeks after the most recent dose and given 8 weeks apart.
- No history of PPSV23: 1 dose of PPSV23 (at least 8 weeks after any prior PCV13 dose).

Age 6–18 years:

- No history of PPSV23: 1 dose of PPSV23 (at least 8 weeks after any prior PCV13 dose).

Cerebrospinal fluid leak; cochlear implant:

Age 2–5 years:

- Any incomplete* schedules with:
 - o 3 PCV13 doses: 1 dose of PCV13 (at least 8 weeks after any prior PCV13 dose).
 - o <3 PCV13 doses: 2 doses of PCV13, 8 weeks after the most recent dose and given 8 weeks apart.
- No history of PPSV23: 1 dose of PPSV23 (at least 8 weeks after any prior PCV13 dose).

Age 6–18 years:

- No history of either PCV13 or PPSV23: 1 dose of PCV13, 1 dose of PPSV23 at least 8 weeks later.
- Any PCV13 but no PPSV23: 1 dose of PPSV23 at least 8 weeks after the most recent dose of PCV13
- PPSV23 but no PCV13: 1 dose of PCV13 at least 8 weeks after the most recent dose of PPSV23.

Sickle cell disease and other hemoglobinopathies; anatomic or functional asplenia; congenital or acquired immunodeficiency; HIV infection; chronic renal failure; nephrotic syndrome; malignant neoplasms, leukemias, lymphomas, Hodgkin disease, and other diseases associated with treatment with immunosuppressive drugs or radiation therapy; solid organ transplantation; multiple myeloma:

Age 2–5 years:

- Any incomplete* schedules with:
 - o 3 PCV13 doses: 1 dose of PCV13 (at least 8 weeks after any prior PCV13 dose).
 - o <3 PCV13 doses: 2 doses of PCV13, 8 weeks after the most recent dose and given 8 weeks apart.
- No history of PPSV23: 1 dose of PPSV23 (at least 8 weeks after any prior PCV13 dose) and a 2nd dose of PPSV23 5 years later.

Age 6–18 years:

- No history of either PCV13 or PPSV23: 1 dose of PCV13, 2 doses of PPSV23 (1st dose of PPSV23 administered 8 weeks after PCV13 and 2nd dose of PPSV23 administered at least 5 years after the 1st dose of PPSV23).
- Any PCV13 but no PPSV23: 2 doses of PPSV23 (1st dose of PPSV23 to be given 8 weeks after the most recent dose of PCV13 and 2nd dose of PPSV23 administered at least 5 years after the 1st dose of PPSV23).

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

- PPSV23 but no PCV13: 1 dose of PCV13 at least 8 weeks after the most recent PPSV23 dose and a 2nd dose of PPSV23 to be given 5 years after the 1st dose of PPSV23 and at least 8 weeks after a dose of PCV13.

Chronic liver disease, alcoholism:

Age 6–18 years:

- No history of PPSV23: 1 dose of PPSV23 (at least 8 weeks after any prior PCV13 dose).

*Incomplete schedules are any schedules where PCV13 doses have not been completed according to ACIP recommended catch-up schedules. The total number and timing of doses for complete PCV13 series are dictated by the age at first vaccination. See Tables 8 and 9 in the ACIP pneumococcal vaccine recommendations (www.cdc.gov/mmwr/pdf/rr/rr5911.pdf) for complete schedule details.

6. Inactivated poliovirus vaccine (IPV). (minimum age: 6 weeks)

Routine vaccination:

- 4-dose series at ages 2, 4, 6–18 months, and 4–6 years. Administer the final dose on or after the 4th birthday and at least 6 months after the previous dose.

Catch-up vaccination:

- In the first 6 months of life, use minimum ages and intervals only for travel to a polio-endemic region or during an outbreak.
- If 4 or more doses were given before the 4th birthday, give 1 more dose at age 4–6 years and at least 6 months after the previous dose.
- A 4th dose is not necessary if the 3rd dose was given on or after the 4th birthday and at least 6 months after the previous dose.
- IPV is not routinely recommended for U.S. residents 18 years and older.

Series Containing Oral Polio Vaccine (OPV), either mixed OPV-IPV or OPV-only series:

- Total number of doses needed to complete the series is the same as that recommended for the U.S. IPV schedule. See www.cdc.gov/mmwr/volumes/66/wr/mm6601a6.htm?s_cid=mm6601a6_w.
- Only trivalent OPV (tOPV) counts toward the U.S. vaccination requirements. For guidance to assess doses documented as “OPV” see www.cdc.gov/mmwr/volumes/66/wr/mm6606a7.htm?s_cid=mm6606a7_w.
- For other catch-up guidance, see Figure 2.

7. Influenza vaccines. (minimum age: 6 months)

Routine vaccination:

- Administer an age-appropriate formulation and dose of influenza vaccine annually.
 - **Children 6 months–8 years** who did not receive at least 2 doses of influenza vaccine before July 1, 2017 should receive 2 doses separated by at least 4 weeks.

- **Persons 9 years and older** 1 dose

- Live attenuated influenza vaccine (LAIV) not recommended for the 2017–18 season.
- For additional guidance, see the 2017–18 ACIP influenza vaccine recommendations (*MMWR* August 25, 2017;66(2):1-20: www.cdc.gov/mmwr/volumes/66/rr/pdfs/rr6602.pdf).

(For the 2018–19 season, see the 2018–19 ACIP influenza vaccine recommendations.)

8. Measles, mumps, and rubella (MMR) vaccine. (minimum age: 12 months for routine vaccination)

Routine vaccination:

- 2-dose series at 12–15 months and 4–6 years.
- The 2nd dose may be given as early as 4 weeks after the 1st dose.

Catch-up vaccination:

- Unvaccinated children and adolescents: 2 doses at least 4 weeks apart.

International travel:

- **Infants 6–11 months:** 1 dose before departure. Revaccinate with 2 doses at 12–15 months (12 months for children in high-risk areas) and 2nd dose as early as 4 weeks later.
- **Unvaccinated children 12 months and older:** 2 doses at least 4 weeks apart before departure.

Mumps outbreak:

- Persons ≥12 months who previously received ≤2 doses of mumps-containing vaccine and are identified by public health authorities to be at increased risk during a mumps outbreak should receive a dose of mumps-virus containing vaccine.

9. Varicella (VAR) vaccine. (minimum age: 12 months)

Routine vaccination:

- 2-dose series: 12–15 months and 4–6 years.
- The 2nd dose may be given as early as 3 months after the 1st dose (a dose given after a 4-week interval may be counted).

Catch-up vaccination:

- Ensure persons 7–18 years without evidence of immunity (see *MMWR* 2007;56[No. RR-4], at www.cdc.gov/mmwr/pdf/rr/rr5604.pdf) have 2 doses of varicella vaccine:
 - **Ages 7–12:** routine interval 3 months (minimum interval: 4 weeks).
 - **Ages 13 and older:** minimum interval 4 weeks.

10. Hepatitis A (HepA) vaccine. (minimum age: 12 months)

Routine vaccination:

- 2 doses, separated by 6–18 months, between the 1st and 2nd birthdays. (A series begun before the 2nd birthday should be completed even if the child turns 2 before the second dose is given.)

Catch-up vaccination:

- Anyone 2 years of age or older may receive HepA vaccine if desired. Minimum interval between doses is 6 months.

Special populations:

Previously unvaccinated persons who should be vaccinated:

- Persons traveling to or working in countries with high or intermediate endemicity
- Men who have sex with men
- Users of injection and non-injection drugs
- Persons who work with hepatitis A virus in a research laboratory or with non-human primates
- Persons with clotting-factor disorders
- Persons with chronic liver disease
- 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 (administer the 1st dose as soon as the adoption is planned—ideally at least 2 weeks before the adoptee’s arrival).

11. Serogroup A, C, W, Y meningococcal vaccines. (Minimum age: 2 months [Menveo], 9 months [Menactra].)

Routine:

- 2-dose series: 11–12 years and 16 years.

Catch-Up:

- Age 13–15 years: 1 dose now and booster at age 16–18 years. Minimum interval 8 weeks.
- Age 16–18 years: 1 dose.

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

Special populations and situations:

Anatomic or functional asplenia, sickle cell disease, HIV infection, persistent complement component deficiency (including eculizumab use):

- **Menveo**
 - o 1st dose at 8 weeks: 4-dose series at 2, 4, 6, and 12 months.
 - o 1st dose at 7–23 months: 2 doses (2nd dose at least 12 weeks after the 1st dose and after the 1st birthday).
 - o 1st dose at 24 months or older: 2 doses at least 8 weeks apart.
- **Menactra**
 - o Persistent complement component deficiency:
 - 9–23 months: 2 doses at least 12 weeks apart
 - 24 months or older: 2 doses at least 8 weeks apart
 - o Anatomic or functional asplenia, sickle cell disease, or HIV infection:
 - 24 months or older: 2 doses at least 8 weeks apart.
 - **Menactra** must be administered at least 4 weeks after completion of PCV13 series.

Children who travel to or live in countries where meningococcal disease is hyperendemic or epidemic, including countries in the African meningitis belt or during the Hajj, or exposure to an outbreak attributable to a vaccine serogroup:

- Children <24 months of age:
 - o **Menveo (2-23 months):**
 - 1st dose at 8 weeks: 4-dose series at 2, 4, 6, and 12 months.
 - 1st dose at 7-23 months: 2 doses (2nd dose at least 12 weeks after the 1st dose and after the 1st birthday).
 - o **Menactra (9-23 months):**
 - 2 doses (2nd dose at least 12 weeks after the 1st dose. 2nd dose may be administered as early as 8 weeks after the 1st dose in travelers).
- Children 2 years or older: 1 dose of **Menveo** or **Menactra**.

Note: **Menactra** should be given either before or at the same time as DTaP. For MenACWY booster dose recommendations for groups listed under “Special populations and situations” above, and additional meningococcal vaccination information, see meningococcal *MMWR* publications at: www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html.

12. Serogroup B meningococcal vaccines (minimum age: 10 years [Bexsero, Trumenba].

Clinical discretion: Adolescents not at increased risk for meningococcal B infection who want MenB vaccine.

MenB vaccines may be given at clinical discretion to adolescents 16–23 years (preferred age 16–18 years) who are not at increased risk.

- **Bexsero:** 2 doses at least 1 month apart.
- **Trumenba:** 2 doses at least 6 months apart. If the 2nd dose is given earlier than 6 months, give a 3rd dose at least 4 months after the 2nd.

Special populations and situations:

Anatomic or functional asplenia, sickle cell disease, persistent complement component deficiency (including eculizumab use), serogroup B meningococcal disease outbreak

- **Bexsero:** 2-dose series at least 1 month apart.
- **Trumenba:** 3-dose series at 0, 1-2, and 6 months.

Note: **Bexsero** and **Trumenba** are not interchangeable.

For additional meningococcal vaccination information, see meningococcal *MMWR* publications at: www.cdc.gov/vaccines/hcp/acip-recs/vacc-specific/mening.html.

13. Tetanus, diphtheria, and acellular pertussis (Tdap) vaccine. (minimum age: 11 years for routine vaccinations, 7 years for catch-up vaccination)

Routine vaccination:

- **Adolescents 11–12 years of age:** 1 dose.
- **Pregnant adolescents:** 1 dose during each pregnancy (preferably during the early part of gestational weeks 27–36).
- Tdap may be administered regardless of the interval since the last tetanus- and diphtheria-toxoid-containing vaccine.

Catch-up vaccination:

- **Adolescents 13–18 who have not received Tdap:** 1 dose, followed by a Td booster every 10 years.
- **Persons aged 7–18 years not fully immunized with DTaP:** 1 dose of Tdap as part of the catch-up series (preferably the first dose). If additional doses are needed, use Td.

- **Children 7–10 years** who receive Tdap inadvertently or as part of the catch-up series may receive the routine Tdap dose at 11–12 years.
- **DTaP inadvertently given after the 7th birthday:**
 - o **Child 7–10:** DTaP may count as part of catch-up series. Routine Tdap dose at 11-12 may be given.
 - o **Adolescent 11–18:** Count dose of DTaP as the adolescent Tdap booster.
- For other catch-up guidance, see Figure 2.

14. Human papillomavirus (HPV) vaccine (minimum age: 9 years)

Routine and catch-up vaccination:

- Routine vaccination for all adolescents at 11–12 years (can start at age 9) and through age 18 if not previously adequately vaccinated. Number of doses dependent on age at initial vaccination:
 - o **Age 9–14 years at initiation:** 2-dose series at 0 and 6–12 months. Minimum interval: 5 months (repeat a dose given too soon at least 12 weeks after the invalid dose and at least 5 months after the 1st dose).
 - o **Age 15 years or older at initiation:** 3-dose series at 0, 1–2 months, and 6 months. Minimum intervals: 4 weeks between 1st and 2nd dose; 12 weeks between 2nd and 3rd dose; 5 months between 1st and 3rd dose (repeat dose(s) given too soon at or after the minimum interval since the most recent dose).
- Persons who have completed a valid series with any HPV vaccine do not need any additional doses.

Special situations:

- **History of sexual abuse or assault:** Begin series at age 9 years.
- **Immunocompromised* (including HIV)** aged 9–26 years: 3-dose series at 0, 1–2 months, and 6 months.
- **Pregnancy:** Vaccination not recommended, but there is no evidence the vaccine is harmful. No intervention is needed for women who inadvertently received a dose of HPV vaccine while pregnant. Delay remaining doses until after pregnancy. Pregnancy testing not needed before vaccination.

*See *MMWR*, December 16, 2016;65(49):1405–1408, at www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm6549a5.pdf.

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

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

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

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

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

Special populations that need additional considerations include:

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

Additional resources for health care providers include:

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

Report suspected cases of reportable vaccine-preventable diseases to the local or state health department, and report all clinically significant postvaccination events to the Vaccine Adverse Event Reporting System at www.vaers.hhs.gov or by telephone, 800-822-7967. All vaccines included in the adult immunization schedule except 23-valent pneumococcal polysaccharide and zoster vaccines are covered by the Vaccine Injury Compensation Program. Information on how to file a vaccine injury claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. Submit questions and comments to CDC through www.cdc.gov/cdc-info or by telephone, 800-CDC-INFO (800-232-4636), in English and Spanish, 8:00am–8:00pm ET, Monday–Friday, excluding holidays.

The following abbreviations are used for vaccines in the adult immunization schedule (in the order of their appearance):

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

1. MMWR Morb Mortal Wkly Rep. 2018;66(5):xx–xx. Available at www.cdc.gov/mmwr/volumes/67/xxxxxxxxxx.

2. Ann Intern Med. 2018;168:xxx–xxx. Available at annals.org/aim/article/doi/10.7326/M17-3439.

3. Clin Infect Dis. 2014;58:e44-100. Available at www.idsociety.org/Templates/Content.aspx?id=32212256011.

4. Kroger et al. Available at www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html.



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

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

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



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



Recommended for adults with other indications



No recommendation

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

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

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

Recommended for adults who meet the age requirement, lack documentation of vaccination, or lack evidence of past infection
 Recommended for adults with other indications
 Contraindicated
 No recommendation

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

1. Influenza vaccination

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

General information

- Administer 1 dose of age-appropriate inactivated influenza vaccine (IIV) or recombinant influenza vaccine (RIV) annually
- Live attenuated influenza vaccine (LAIV) is not recommended for the 2017–2018 influenza season
- A list of currently available influenza vaccines is available at www.cdc.gov/flu/protect/vaccine/vaccines.htm

Special populations

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

2. Tetanus, diphtheria, and pertussis vaccination

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

General information

- Administer to adults who previously did not receive a dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) as an adult or child (routinely recommended at age 11–12 years) 1 dose of Tdap, followed by a dose of tetanus and diphtheria toxoids (Td) booster every 10 years
- Information on the use of Tdap or Td as tetanus prophylaxis in wound management is available at www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm

Special populations

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

3. Measles, mumps, and rubella vaccination

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

General information

- Administer 1 dose of measles, mumps, and rubella vaccine (MMR) to adults with no evidence of immunity to measles, mumps, or rubella
- Evidence of immunity is:
 - Born before 1957 (except for health care personnel, see below)
 - Documentation of receipt of MMR
 - Laboratory evidence of immunity or disease
- Documentation of a health care provider-diagnosed disease without laboratory confirmation is not considered evidence of immunity

Special populations

- **Pregnant women and nonpregnant women of childbearing age** with no evidence of immunity to rubella: Administer 1 dose of MMR (if pregnant, administer MMR after pregnancy and before discharge from health care facility)

- **HIV infection and CD4 cell count ≥ 200 cells/ μL for at least 6 months** and no evidence of immunity to measles, mumps, or rubella: Administer 2 doses of MMR at least 28 days apart
- **Students in postsecondary educational institutions, international travelers, and household contacts of immunocompromised persons:** Administer 2 doses of MMR at least 28 days apart (or 1 dose of MMR if previously administered 1 dose of MMR)

- **Health care personnel born in 1957 or later** with no evidence of immunity: Administer 2 doses of MMR at least 28 days apart for measles or mumps, or 1 dose of MMR for rubella (if born before 1957, consider MMR vaccination)
- Adults who **previously received ≤ 2 doses of mumps-containing vaccine and are identified by public health authority to be at increased risk for mumps in an outbreak:** Administer 1 dose of MMR
- MMR is contraindicated for pregnant women and adults with severe immunodeficiency

4. Varicella vaccination

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

General information

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

Special populations

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

5. Zoster vaccination

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

General information

- Administer 2 doses of recombinant zoster vaccine (RZV) 2–6 months apart to adults aged 50 years or older regardless of past episode of herpes zoster or receipt of zoster vaccine live (ZVL)

- Administer 2 doses of RZV 2–6 months apart to adults who previously received ZVL at least 2 months after ZVL
- For adults aged 60 years or older, administer either RZV or ZVL (RZV is preferred)

Special populations

- ZVL is contraindicated for pregnant women and adults with severe immunodeficiency

6. Human papillomavirus vaccination

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

General information

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

Special populations

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

7. Pneumococcal vaccination

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

General information

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

Special populations

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

8. Hepatitis A vaccination

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

General information

- Administer to adults who have a specific risk (see below), or lack a risk factor but want protection, 2-dose series of single antigen hepatitis A vaccine (HepA; Havrix at 0 and 6–12 months or Vaqta at 0 and 6–18 months; minimum interval: 6 months) or a 3-dose series of combined hepatitis A and hepatitis B vaccine (HepA-HepB) at 0, 1, and 6 months; minimum intervals: 4 weeks between first and second doses, 5 months between second and third doses

Special populations

- Administer HepA or HepA-HepB to adults with the following indications:
 - Travel to or work in countries with high or intermediate hepatitis A endemicity**
 - Men who have sex with men**
 - Injection or noninjection drug use**
 - Work with hepatitis A virus in a research laboratory or with nonhuman primates infected with hepatitis A virus**
 - Clotting factor disorders**
 - Chronic liver disease**

- Close, personal **contact with an international adoptee** (e.g., household or regular babysitting) during the first 60 days after arrival in the United States from a country with high or intermediate endemicity (administer the first dose as soon as the adoption is planned)
- Healthy adults **through age 40 years who have recently been exposed to hepatitis A virus**; adults older than age 40 years may receive HepA or HepA-HepB if hepatitis A immunoglobulin cannot be obtained

9. Hepatitis B vaccination

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

General information

- Administer to adults who have a specific risk (see below), or lack a risk factor but want protection, 3-dose series of single antigen hepatitis B vaccine (HepB) or combined hepatitis A and hepatitis B vaccine (HepA-HepB) at 0, 1, and 6 months (minimum intervals: 4 weeks between doses 1 and 2 for HepB and HepA-HepB; between doses 2 and 3, 8 weeks for HepB and 5 months for HepA-HepB)

Special populations

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

10. Meningococcal vaccination

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

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

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

General Information: Serogroup B meningococcal vaccine (MenB)

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

Special populations: MenB

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

11. *Haemophilus influenzae* type b vaccination

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

Special populations

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

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

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

Contraindications and precautions for vaccines routinely recommended for adults

Vaccine(s)	Contraindications	Precautions
All vaccines routinely recommended for adults	<ul style="list-style-type: none"> Severe reaction, e.g., anaphylaxis, after a previous dose or to a vaccine component 	<ul style="list-style-type: none"> Moderate or severe acute illness with or without fever

Additional contraindications and precautions for vaccines routinely recommended for adults

Vaccine(s)	Additional Contraindications	Additional Precautions
IIV ¹		<ul style="list-style-type: none"> History of Guillain-Barré syndrome within 6 weeks after previous influenza vaccination Egg allergy other than hives, e.g., angioedema, respiratory distress, lightheadedness, or recurrent emesis; or required epinephrine or another emergency medical intervention (IIV may be administered in an inpatient or outpatient medical setting and under the supervision of a health care provider who is able to recognize and manage severe allergic conditions)
RIV ¹		<ul style="list-style-type: none"> History of Guillain-Barré syndrome within 6 weeks after previous influenza vaccination
Tdap, Td	<ul style="list-style-type: none"> For pertussis-containing vaccines: encephalopathy, e.g., coma, decreased level of consciousness, or prolonged seizures, not attributable to another identifiable cause within 7 days of administration of a previous dose of a vaccine containing tetanus or diphtheria toxoid or acellular pertussis 	<ul style="list-style-type: none"> Guillain-Barré syndrome within 6 weeks after a previous dose of tetanus toxoid-containing vaccine History of Arthus-type hypersensitivity reactions after a previous dose of tetanus or diphtheria toxoid-containing vaccine. Defer vaccination until at least 10 years have elapsed since the last tetanus toxoid-containing vaccine For pertussis-containing vaccine, progressive or unstable neurologic disorder, uncontrolled seizures, or progressive encephalopathy (until a treatment regimen has been established and the condition has stabilized)
MMR ²	<ul style="list-style-type: none"> Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy³, human immunodeficiency virus (HIV) infection with severe immunocompromise Pregnancy 	<ul style="list-style-type: none"> Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)⁴ History of thrombocytopenia or thrombocytopenic purpura Need for tuberculin skin testing⁵
VAR ²	<ul style="list-style-type: none"> Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy³, HIV infection with severe immunocompromise Pregnancy 	<ul style="list-style-type: none"> Recent (within 11 months) receipt of antibody-containing blood product (specific interval depends on product)⁴ Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)
ZVL ²	<ul style="list-style-type: none"> Severe immunodeficiency, e.g., hematologic and solid tumors, chemotherapy, congenital immunodeficiency or long-term immunosuppressive therapy³, HIV infection with severe immunocompromise Pregnancy 	<ul style="list-style-type: none"> Receipt of specific antiviral drugs (acyclovir, famciclovir, or valacyclovir) 24 hours before vaccination (avoid use of these antiviral drugs for 14 days after vaccination)
HPV vaccine		<ul style="list-style-type: none"> Pregnancy
PCV13	<ul style="list-style-type: none"> Severe allergic reaction to any vaccine containing diphtheria toxoid 	

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

* Adapted from: CDC. Table 6. Contraindications and precautions to commonly used vaccines. General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices. MMWR. 2011;60(No. RR-2):40–1 and from: Hamborsky J, Kroger A, Wolfe S, eds. Appendix A. Epidemiology and prevention of vaccine preventable diseases. 13th ed. Washington, DC: Public Health Foundation, 2015. Available at www.cdc.gov/vaccines/pubs/pinkbook/index.html.

Abbreviations of vaccines

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