

# Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger

UNITED STATES  
**2023**

## Vaccines in the Child and Adolescent Immunization Schedule\*

Vaccine	Abbreviation(s)	Trade name(s)
COVID-19	1vCOV-mRNA	Moderna COVID-19 Vaccine Spikevax™/Moderna COVID-19 Vaccine Pfizer-BioNTech COVID-19 Vaccine, Bivalent Moderna COVID-19 Vaccine, Bivalent Novavax COVID-19 Vaccine, Bivalent
Dengue vaccine	DENGVACV	Dengvaxia®
Diphtheria, tetanus, and acellular pertussis vaccine	Tdap	Adacel® Boostrix®
Diphtheria tetanus vaccine	DT	No trade name
<i>Haemophilus influenzae</i> type b vaccine	Hib (IPV-T) Hib (IPV-OMP) HepA	ActHib® Hibex® PedvaxiHib® Vaxivert® Vaxitri®
Hepatitis A vaccine	HepA	Vaxivert®
Hepatitis B vaccine	HepB	Engerix-B® Heplisav-B® Gardasil 9®
Human papillomavirus vaccine	HPV	Multiple
Influenza vaccine (inactivated)	IVIA	Multiple
Influenza vaccine (live, attenuated)	LAIV4	FluMist® Quadrivalent
Measles, mumps, and rubella vaccine	MMR	MM-R II® ProQuad®
Meningococcal serogroup A, C, W,Y vaccine	MenACWY-D MenACWY-CRM MenACWY-TT MenB-4C MenB-FHbp	Menactra® Menveo® MenQuadfi® Bexsero® Trumenb®
Meningococcal serogroup B vaccine	PCV13 PCV23	Prevnar 13® Vaxneuvac™
Pneumococcal conjugate vaccine	IPV	Pneumovax 23®
Pneumococcal polysaccharide vaccine	IPV	IPOL®
Poliovirus vaccine (inactivated)	IPV	Polioject®
Poliovirus vaccine	RV25	Polioject® Adacel® Boostrix®
Tetanus, diphtheria, and acellular pertussis vaccine	Tdap	Tenivac® Tdapvax®
Tetanus and diphtheria vaccine	Td	Tenivac® Tdapvax®
Varicella vaccine	VAR	Varinivac®

**Combination vaccines (use combination vaccines instead of separate injections when appropriate)**

DTap	Diphtheria, tetanus, and acellular pertussis vaccine
DTap-Hepl-B-IPV	Diphtheria, tetanus, acellular pertussis, and inactivated poliovirus vaccine
DTap-IPV/Hib	Diphtheria, tetanus, acellular pertussis, inactivated poliovirus, and <i>Haemophilus influenzae</i> type b vaccine
DTap-IPV	Diphtheria, tetanus, and inactivated poliovirus vaccine
DTap-IPV-Hib	Diphtheria, tetanus, acellular pertussis, inactivated poliovirus, and <i>Haemophilus influenzae</i> type b, and <i>Haemophilus influenzae</i> type b vaccine
MMRV	Measles, mumps, rubella, and varicella vaccine

\*A vaccine history is incomplete or unknown. Do not start or add dose of a vaccine series for an individual until the vaccine history is complete or administered at the recommended age, administered at a subsequent visit. The use of trade name is for identification purposes only and does not imply endorsement by the ACIP or CDC.

## How to use the child and adolescent immunization schedule

- 1** Determine recommended vaccine by age (Table 1)
- 2** Determine recommended interval for catch-up vaccination (Table 2)
- 3** Assess need for additional recommended vaccines by medical condition or other indication (Table 3)
- 4** Review vaccine types, frequencies, intervals, and precautions for vaccine types (Appendix)
- 5** Review vaccine types, frequencies, intervals, and precautions for vaccine types (Appendix)

Recommended by the Advisory Committee on Immunization Practices ([www.cdc.gov/vaccine/sacip](http://www.cdc.gov/vaccine/sacip)) and approved by the Centers for Disease Control and Prevention ([www.cdc.gov](http://www.cdc.gov)), American Academy of Pediatrics ([www.aap.org](http://www.aap.org)), American Academy of Family Physicians ([www.aafp.org](http://www.aafp.org)), American College of Obstetricians and Gynecologists ([www.acog.org](http://www.acog.org)), American College of Nurse-Midwives ([www.midwife.org](http://www.midwife.org)), American Association of Physician Associates ([www.aapa.org](http://www.aapa.org)), and National Association of Pediatric Nurse Practitioners ([www.napnap.org](http://www.napnap.org)).

### Report

- Suspected cases of reportable vaccine-preventable diseases or outbreaks to your state or local health department
- Clinically significant adverse events to the Vaccine Adverse Event Reporting System (VAERS) at [www.vaers.hhs.gov](http://www.vaers.hhs.gov), or 800-822-7967

### Questions or comments

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



Download the CDC Vaccine Schedules app for providers at [www.cdc.gov/vaccines/schedules/hcp/schedule-app.html](http://www.cdc.gov/vaccines/schedules/hcp/schedule-app.html)

### Helpful information

- Complete Advisory Committee on Immunization Practices (ACIP) recommendations: [www.cdc.gov/vaccines/hcp/acip-recs/index.html](http://www.cdc.gov/vaccines/hcp/acip-recs/index.html)
- General Best Practice Guidelines for Immunization (including contraindications and precautions): [www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/index.html)
- Vaccine information statements: [www.cdc.gov/vaccines/hcp/vi6/index.html](http://www.cdc.gov/vaccines/hcp/vi6/index.html)
- Manual for the Surveillance of Vaccine-Preventable Diseases (including case identification and outbreak response): [www.cdc.gov/vaccines/pubs/surv-manual](http://www.cdc.gov/vaccines/pubs/surv-manual)
- ACIP Shared Clinical Decision-Making Recommendations: [www.cdc.gov/vaccines/acip/acip-scdm-faqs.html](http://www.cdc.gov/vaccines/acip/acip-scdm-faqs.html)

Scan QR code for access to online schedule



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

# Table 1 Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2023

These recommendations must be read with the notes 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 (Table 2).

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19-23 mo	2-3 yrs	4-6 yrs	7-10 yrs	11-12 yrs	13-15 yrs	16 yrs	17-18 yrs	
Hepatitis B (HepB)	1 <sup>st</sup> dose	4 <sup>th</sup> → 2 <sup>nd</sup> dose →					3 <sup>rd</sup> dose →											
Rotavirus (RV): RV1 (2-dose series), RV5 (3-dose series)		1 <sup>st</sup> dose		2 <sup>nd</sup> dose	See Notes													
Diphtheria, tetanus, acellular pertussis (DTaP <7 yrs)		1 <sup>st</sup> dose		2 <sup>nd</sup> dose	3 <sup>rd</sup> dose			4 <sup>th</sup> dose →			5 <sup>th</sup> dose							
Haemophilus influenzae type b (Hib)		1 <sup>st</sup> dose		2 <sup>nd</sup> dose	See Notes		3 <sup>rd</sup> or 4 <sup>th</sup> dose, See Notes											
Pneumococcal conjugate (PCV13, PCV15)		1 <sup>st</sup> dose		2 <sup>nd</sup> dose	3 <sup>rd</sup> dose		4 <sup>th</sup> dose →											
Inactivated poliovirus (IPV <18 yrs)		1 <sup>st</sup> dose		2 <sup>nd</sup> dose			3 <sup>rd</sup> dose →				4 <sup>th</sup> dose						See Notes	
COVID-19 (1vCOV-mRNA, 2vCOV-mRNA, 1vCOV-aP5)									2- or 3-dose primary series and booster (See Notes)									
Influenza (IV4)									Annual vaccination 1 or 2 doses								Annual vaccination 1 dose only	
Influenza (LAIV4)																	Annual vaccination 1 or 2 doses	
Measles, mumps, rubella (MMR)						See Notes		1 <sup>st</sup> dose →									2 <sup>nd</sup> dose	
Varicella (VAR)								1 <sup>st</sup> dose →									2 <sup>nd</sup> dose	
Hepatitis A (HepA)						See Notes			2-dose series, See Notes									
Tetanus, diphtheria, acellular pertussis (Tdap ≥7 yrs)																	1 dose	
Human papillomavirus (HPV)																	See Notes	
Meningococcal (MenACWY-D ≥9 mos, MenACWY-CRM ≥2 mos, MenACWY-TT ≥2 years)																	1 <sup>st</sup> dose	
Meningococcal B (MenB-4C, MenB-PhiP)																	2 <sup>nd</sup> dose	
Pneumococcal polysaccharide (PPSV23)																	See Notes	
Dengue (DEN4C/D: 9-16 yrs)																	See Notes	
Range of recommended ages for all children																		
Range of recommended ages for catch-up vaccination																		
Range of recommended ages for certain high-risk groups																		
Recommended vaccination can begin in this age group																		
Recommended vaccination on shared clinical decision-making																		
No recommendation/not applicable																		
Seropositive in endemic dengue areas (See Notes)																		

## Table 2

### Recommended Catch-up Immunization Schedule for Children and Adolescents Who Start Late or Who Are More than 1 Month Behind, United States, 2023

The table 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 Table 1 and the Notes that follow.

Vaccine	Minimum Interval Between Doses				
	Dose 1	Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
Hepatitis B	Birth	4 weeks	8 weeks and at least 16 weeks after first dose minimum age for final dose is 24 weeks		
Rotavirus	6 weeks Maximum age for first dose is 14 weeks, 6 days. 6 weeks	4 weeks	4 weeks maximum age for final dose is 8 months, 0 days	6 months	6 months
Diphtheria, tetanus, and acellular pertussis	6 weeks	No further doses needed If previous dose was administered at age 15 months or older: 4 weeks If current age is younger than 12 months and previous dose was administered at younger than age 7 months and at least 1 previous dose was Prip-T (ACP/IB*, Pentacel*, Hibiter*, Novartis* or unknown) 8 weeks and age 12 through 59 months (as final dose) OR 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 <sup>st</sup> birthday and a second dose was administered at younger than 15 months: OR If both doses were PedvaxHib* and were administered before the 1 <sup>st</sup> birthday	No further doses needed If previous dose was administered at age 15 months or older: 4 weeks If current age is younger than 12 months and previous dose was administered at younger than age 7 months and at least 1 previous dose was Prip-T (ACP/IB*, Pentacel*, Hibiter*, Novartis* or unknown) 8 weeks and age 12 through 59 months (as final dose) OR If current age is 12 through 59 months and first dose was administered before the 1 <sup>st</sup> birthday and a second dose was administered at younger than 15 months: OR If both doses were PedvaxHib* and were administered before the 1 <sup>st</sup> birthday	8 weeks (as final dose) This dose is only necessary for children aged 12 through 59 months who received 3 doses before the 1 <sup>st</sup> birthday.	
Pneumococcal conjugate	6 weeks	No further doses needed for healthy children if first dose was administered at age 24 months or older: 4 weeks If previous dose was administered before the 1 <sup>st</sup> birthday: 8 weeks (as final dose for healthy children) OR If previous dose was administered at the 1 <sup>st</sup> birthday or after	No further doses needed for healthy children if previous dose was administered at age 24 months or older: 4 weeks If current age is younger than 12 months and previous dose was administered at <7 months old: 8 weeks (as final dose for healthy children) OR If previous dose was administered between 7–11 months (but until at least 12 months old): OR If current age is 12 months or older and at least 1 dose was administered before age 12 months	8 weeks (as final dose) This dose is only necessary for children aged 12 through 59 months who received 3 doses before the 1 <sup>st</sup> birthday with any risk, who received 3 doses before age 12 months.	
Inactivated poliovirus	6 weeks	4 weeks	4 weeks if current age is <4 years 6 months (as final dose) if current age is 4 years or older	6 months (minimum age 4 years for final dose)	
Masik's mumps, rubella	12 months	4 weeks			
Vaccella	12 months	3 months			
Hepatitis A	12 months	6 months			
Meningococcal ACWY	2 months MenACWY/CRM 9 months MenACWYD 2 years MenACWY/DT	8 weeks			
Meningococcal ACWY	Not applicable (N/A)	8 weeks			
Tetanus, diphtheria, and acellular pertussis	7 years	4 weeks	4 weeks If first dose of DTaP/DT or Tdap/Td was administered before the 1 <sup>st</sup> birthday 6 months If first dose of DTaP/DT or Tdap/Td was administered at or after the 1 <sup>st</sup> birthday	6 months If first dose of DTaP/DT was administered before the 1 <sup>st</sup> birthday	
Human papillomavirus	9 years	Route dosing intervals are recommended.			
Hepatitis A	N/A	6 months			
Hepatitis B	N/A	4 weeks			
Inactivated poliovirus	N/A	4 weeks	8 weeks and at least 16 weeks after first dose 6 months 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 fourth dose was administered 6 months after the second dose.
Masik's mumps, rubella	N/A	4 weeks			
Vaccella	N/A	3 months if younger than age 13 years. 4 weeks if age 13 years or older			
Dengue	9 years	6 months	6 months		

### Children and adolescents age 7 through 18 years

**Table 3**

**Recommended Child and Adolescent Immunization Schedule by Medical Indication, United States, 2023**

Always use this table in conjunction with Table 1 and the Notes that follow.

VACCINE	INDICATION									
	Pregnancy	Immunocompromised status (excluding HIV infection)	HIV infection CD4+ count* ≥15% of total CD4 cell count of <200/mm <sup>3</sup>	Kidney failure, end-stage renal disease, or on hemodialysis	Heart disease or chronic lung disease	CSF leak or cochlear implant	Asplenia or persistent complement component deficiencies	Chronic liver disease	Diabetes	
Hepatitis B	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Rotavirus	Yellow	Red (SGD) <sup>b</sup>	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Diphtheria, tetanus, and acellular pertussis (DTaP)	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Haemophilus influenzae type b	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Pneumococcal conjugate	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Inactivated poliovirus	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
COVID-19	Yellow	See Notes	See Notes	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Influenza (IV/4)	Yellow	See Notes	See Notes	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Influenza (LAIV/4)	Yellow	Red	Red	Yellow	Orange (Asthma wheezing 2–4 yrs) <sup>c</sup>	Red	Red	Orange	Orange	
Measles, mumps, rubella	Yellow	Red	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Varicella	Yellow	Red	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Hepatitis A	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Tetanus, diphtheria, and acellular pertussis (Tdap)	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Human papillomavirus	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Meningococcal ACWY	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Meningococcal B	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Pneumococcal polysaccharide	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	
Dengue	Yellow	Red	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	

a. Vaccination according to the routine schedule recommended

b. Recommended for additional risk factors for which the vaccine would be indicated

c. Vaccination is recommended, and additional risk factors should be considered when assessing condition or vaccine. See Notes.

Yellow: Recommended for routine schedule

Orange: Precaution—vaccine might be of benefit or no effect, but risk of adverse reaction

Red: Contraindicated or not recommended—vaccine should not be administered

Yellow with grid: \*Vaccinate after pregnancy

No recommendation/not applicable

a. For 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/imz/downloads/pdf/gpi/gpi-09-10.pdf](http://www.cdc.gov/vaccines/imz/downloads/pdf/gpi/gpi-09-10.pdf)

b. For additional information regarding immunocompetence, see the General Best Practice Guidelines for Immunization, "Immunocompetence" at [www.cdc.gov/vaccines/imz/downloads/pdf/gpi/gpi-09-10.pdf](http://www.cdc.gov/vaccines/imz/downloads/pdf/gpi/gpi-09-10.pdf)

c. LAIV4 contraindicated for children 2–4 years of age with asthma or wheezing during the preceding 12 months

## Notes

## Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2023

For vaccination recommendations for persons ages 19 years or older, see the Recommended Adult Immunization Schedule, 2023.

### Additional information

- Consult relevant ACP statements for detailed recommendations at [www.cdc.gov/vaccines/hcp/acip-recs/index.html](http://www.cdc.gov/vaccines/hcp/acip-recs/index.html).
- For calculating intervals between doses, 4 weeks = 28 days. Intervals of  $\geq 4$  months are determined by calendar months.
- Within a number range (e.g., 12–18), a dash (–) should be read as “through.”
- Vaccine doses administered  $\leq 4$  days before the minimum age or interval are considered valid. Doses of any vaccine administered  $\geq 5$  days earlier than the minimum age or minimum interval 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 3–2. Recommended and minimum ages and intervals between vaccine doses, in *General Best Practice Guidelines for Immunization* at [www.cdc.gov/vaccines/hcp/acip-recs/timing.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timing.html).
- Information on travel vaccination requirements and recommendations is available at [www.cdc.gov/travel/](http://www.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/immunocompromise.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/immunocompromise.html), and Immunization in Special Clinical Circumstances (in: *Millerlin DN, Barnett ED, of the Committee on Infectious Diseases. 32<sup>nd</sup> ed. Itasca, IL: American Academy of Pediatrics; 2021:72–86*).
- For information about vaccination in the setting of a vaccine-preventable disease outbreak, contact your state or local health department.
- The National Vaccine Injury Compensation Program (VICP) is a no-fault alternative to the traditional legal system for resolving vaccine injury claims. All vaccines included in the child and adolescent vaccine schedule are covered by VICP except dengue, PPSV23, and COVID-19 vaccines. COVID-19 vaccines that are authorized or approved by the FDA are covered by the Countermeasures Injury Compensation Program (CICP). For more information, see [www.hrsa.gov/vaccinecompensation](http://www.hrsa.gov/vaccinecompensation) or [www.hrsa.gov/cicp](http://www.hrsa.gov/cicp).

**COVID-19 vaccination**  
(minimum age: 6 months [Moderna and Pfizer-BioNTech COVID-19 vaccines], 12 years [Novavax COVID-19 Vaccine])

### Routine vaccination

- **Primary series:**
  - **Age 6 months–4 years:** 2-dose series at 0, 4–8 weeks (Moderna) or 3-dose series at 0, 3–8, 11–16 weeks (Pfizer-BioNTech)
  - **Age 5–11 years:** 2-dose series at 0, 4–8 weeks (Moderna) or 2-dose series at 0, 3–8 weeks (Pfizer-BioNTech)
  - **Age 12–18 years:** 2-dose series at 0, 4–8 weeks (Moderna) or 2-dose series at 0, 3–8 weeks (Novavax, Pfizer-BioNTech)
- For **booster dose recommendations** see [www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html](http://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html)

### Special situations

Persons who are moderately or severely immunocompromised

- **Primary series**
  - **Age 6 months–4 years:** 3-dose series at 0, 4, 8 weeks (Moderna) or 3-dose series at 0, 3, 11 weeks (Pfizer-BioNTech)
  - **Age 5–11 years:** 3-dose series at 0, 4, 8 weeks (Moderna) or 3-dose series at 0, 3, 7 weeks (Pfizer-BioNTech)
  - **Age 12–18 years:** 3-dose series at 0, 4, 8 weeks (Moderna) or 2-dose series at 0, 3, 7 weeks (Novavax) or 3-dose series at 0, 3, 7 weeks (Pfizer-BioNTech)
- **Booster dose:** see [www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html](http://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html)
- **Pre-exposure prophylaxis** (monoclonal antibodies) may be considered to complement COVID-19 vaccination. See [www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.htm#immunocompromised](http://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.htm#immunocompromised)
- **For Janssen COVID-19 Vaccine recipients** see COVID-19 schedule at [www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html](http://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html)
- **Note:** Administer an age-appropriate vaccine product for each dose. Current COVID-19 schedule and dosage formulation available at [www.cdc.gov/vaccines/covid-19/downloads/covid-19-immunization-schedule-ages-6months-older.pdf](http://www.cdc.gov/vaccines/covid-19/downloads/covid-19-immunization-schedule-ages-6months-older.pdf). For more information on Emergency Use Authorization (EUA) indications for COVID-19 vaccines, see [www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines](http://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines).

**Dengue vaccination**  
(minimum age: 9 years)

### Routine vaccination

- Age 9–16 years living in areas with endemic dengue AND have laboratory confirmation of previous dengue infection
- 3-dose series administered at 0, 6, and 12 months
- Endemic areas include Puerto Rico, American Samoa, US Virgin Islands, Federated States of Micronesia, Republic of Marshall Islands, and the Republic of Palau. For updated guidance on dengue endemic areas and pre-vaccination laboratory testing see [www.cdc.gov/mmwr/volumes/70/wr/r7006a1.htm](http://www.cdc.gov/mmwr/volumes/70/wr/r7006a1.htm), [www.cdc.gov/denque/vaccine/hcp/index.html](http://www.cdc.gov/denque/vaccine/hcp/index.html)
- Dengue vaccine should not be administered to children traveling to or visiting endemic dengue areas.

**Diphtheria, tetanus, and pertussis (DTaP) vaccination** (minimum age: 6 weeks (4 years for Kinrix<sup>®</sup> or Quadracel<sup>®</sup>))

### Routine vaccination

- 5-dose series at age 2, 4, 6, 15–18 months, 4–6 years
- **Prospectively:** Dose 4 may be administered as early as age 12 months if at least 6 months have elapsed since dose 3.
- **Retrospectively:** A 4<sup>th</sup> dose that was inadvertently administered as early as age 12 months may be counted if at least 4 months have elapsed since dose 3.

### Catch-up vaccination

- Dose 5 is not necessary if dose 4 was administered at age 4 years or older and at least 6 months after dose 3.
- For other catch-up guidance, see Table 2.

### Special situations

- **Wound management** in children less than age 7 years with history of 3 or more doses of tetanus-toxoid-containing vaccine: For all wounds except clean and minor wounds, administer DTaP if more than 5 years since last dose of tetanus-toxoid-containing vaccine. For detailed information, see [www.cdc.gov/mmwr/volumes/67/rr/r6702a1.htm](http://www.cdc.gov/mmwr/volumes/67/rr/r6702a1.htm).

### Haemophilus influenzae type b vaccination (minimum age: 6 weeks)

#### Routine vaccination

- **ActHIB<sup>®</sup>**, **Hiberix<sup>®</sup>**, **PentaCell<sup>®</sup>**, or **Vaxelis<sup>®</sup>**: 4-dose series (3-dose primary series at age 2, 4, and 6 months, followed by a booster dose\* at age 12–15 months)
- **Vaxelis<sup>®</sup>** is not recommended for use as a booster dose. A different Hib-containing vaccine should be used for the booster dose.
- **PedvaxHIB<sup>®</sup>**: 3-dose series (2-dose primary series at age 2 and 4 months, followed by a booster dose at age 12–15 months)

#### Catch-up vaccination

- **Dose 1 at age 7–11 months**: Administer dose 2 at least 4 weeks later and dose 3 (final dose) at age 12–15 months or 8 weeks after dose 2 (whichever is later).
- **Dose 1 at age 12–14 months**: Administer dose 2 (final dose) at least 8 weeks after dose 1.
- **Dose 1 before age 12 months and dose 2 before age 15 months**: Administer dose 3 (final dose) at least 8 weeks after dose 2.
- **2 doses of PedvaxHIB<sup>®</sup> before age 12 months**: Administer dose 3 (final dose) at age 12–59 months and at least 8 weeks after dose 2.
- **1 dose administered at age 15 months or older**: No further doses needed
- **Unvaccinated at age 15–59 months**: Administer 1 dose.
- **Previously unvaccinated children age 60 months or older who are not considered high risk**: Do not require catch-up vaccination

For other catch-up guidance, see Table 2. Vaxelis<sup>®</sup> can be used for catch-up vaccination in children less than age 5 years. Follow the catch-up schedule even if Vaxelis<sup>®</sup> is used for one or more doses. For detailed information on use of Vaxelis<sup>®</sup> see [www.cdc.gov/mmwr/volumes/69/wr/mm6905a5.htm](http://www.cdc.gov/mmwr/volumes/69/wr/mm6905a5.htm).

#### Special situations

- **Chemotherapy or radiation treatment**: Age 12–59 months.
    - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart
    - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose
- Doses administered 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 4 weeks apart starting 6 to 12 months after successful transplant, regardless of Hib vaccination history

#### Anatomic or functional asplenia (including sickle cell disease):

- Age 12–59 months
  - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart
  - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose
- *Unvaccinated<sup>†</sup> persons age 5 years or older*: -1 dose

#### Elective splenectomy:

- *Unvaccinated<sup>†</sup> persons age 15 months or older*: 1 dose (preferably at least 14 days before procedure)

#### HIV infection:

- Age 12–59 months
  - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart
  - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose
- *Unvaccinated<sup>†</sup> persons age 5–18 years*: -1 dose

#### Immunoglobulin deficiency, early component complement deficiency:

- Age 12–59 months
    - Unvaccinated or only 1 dose before age 12 months: 2 doses, 8 weeks apart
    - 2 or more doses before age 12 months: 1 dose at least 8 weeks after previous dose
- \*Unvaccinated = Less than routine series (through age 14 months) OR no doses (age 15 months or older)

### Hepatitis A vaccination (minimum age: 12 months for routine vaccination)

#### Routine vaccination

- 2-dose series (minimum interval: 6 months) at age 12–23 months

#### Catch-up vaccination

- Unvaccinated persons through age 18 years should complete a 2-dose series (minimum interval: 6 months).
- Persons who previously received 1 dose at age 12 months or older should receive dose 2 at least 6 months after dose 1.

- Adolescents age 18 years or older may receive the combined HepA and HepB vaccine, **Twinrix<sup>®</sup>**, as a 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months).

#### International travel

- Persons traveling to or working in countries with high or intermediate endemic hepatitis A ([www.cdc.gov/travel/](http://www.cdc.gov/travel/)):
  - **Infants age 6–11 months**: 1 dose before departure; revaccinate with 2 doses (separated by at least 6 months) between age 12–23 months.
  - **Unvaccinated age 12 months or older**: Administer dose 1 as soon as travel is considered.

### Hepatitis B vaccination (minimum age: birth)

#### Routine vaccination

- 3-dose series at ages 0, 1–2, 6–18 months (**use monovalent HepB vaccine for doses administered before age 6 weeks**)
  - Birth weight  $\geq 2,000$  grams: 1 dose within 24 hours of birth if medically stable
  - Birth weight <2,000 grams: 1 dose at chronological age 1 month or hospital discharge (whichever is earlier and even if weight is still <2,000 grams).
- Infants who did not receive a birth dose should begin the series as soon as possible (see Table 2 for minimum intervals).
- Administration of 4 doses is permitted when a combination vaccine containing HepB is used after the birth dose.
- **Minimum intervals** (see Table 2): when 4 doses are administered, substitute "dose 4" for "dose 3" in these calculations

- **Final (3rd or 4th) dose**: age 6–18 months (minimum age 24 weeks)

#### Mother is HBsAg-positive

- **Birth dose (monovalent HepB vaccine only)**: administer HepB vaccine and hepatitis B immune globulin (HBIG) (in separate limbs) within 12 hours of birth, regardless of birth weight.
- **Birth weight <2,000 grams**: administer 3 additional doses of HepB vaccine beginning at age 1 month (total of 4 doses) (minimum age 24 weeks)
- **Final (3rd or 4th) dose**: administer at age 6 months
- **Test for HBsAg and anti-HBs at age 9–12 months**. If HepB series is delayed, test 1–2 months after final dose. Do not test before age 9 months.

## Notes

## Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2023

### • **Mother is HBsAg-unknown**

If other evidence suggestive of maternal hepatitis B infection exists (e.g., presence of HBV DNA, HBeAg-positive, or mother known to have chronic hepatitis B infection), manage infant as if mother is HBsAg-positive

- **Birth dose (monovalent HepB vaccine only):** Birth weight  $\geq 2,000$  grams: administer **HepB vaccine** within 12 hours of birth. Determine mother's HBsAg status as soon as possible. If mother is determined to be HBsAg-positive, administer **HBIG** as soon as possible (in separate limb), but no later than 7 days of age.
- Birth weight <2,000 grams: administer **HepB vaccine** and **HBIG** (in separate limbs) within 12 hours of birth. Administer 3 additional doses of **HepB vaccine** beginning at age 1 month (total of 4 doses)
- **Final (3rd or 4th) dose:** administer at age 6 months (minimum age 24 weeks)
- If mother is determined to be HBsAg-positive or if status remains unknown, test for HBsAg and anti-HBs at age 9–12 months. If HepB series is delayed, test 1–2 months after final dose. Do not test before age 3 months.

### Catch-up vaccination

- Unvaccinated persons should complete a 3-dose series at 0, 1–2, 6 months. See Table 2 for minimum intervals
- Adolescents age 11–15 years may use an alternative 2-dose schedule with at least 4 months between doses (adult formulation **Recombivax HB<sup>®</sup>** only).
- Adolescents age 18 years or older may receive
  - **HepIsivax-B<sup>®</sup>**: 2-dose series at least 4 weeks apart
  - **PreHevrio<sup>®</sup>**: 3-dose series at 0, 1, and 6 months
- Combined HepA and HepB vaccine, **Twintrix<sup>®</sup>**: 3-dose series (0, 1, and 6 months) or 4-dose series (3 doses at 0, 7, and 21–30 days, followed by a booster dose at 12 months).

### Special situations

- Revaccination is not generally recommended for persons with a normal immune status who were vaccinated as infants, children, adolescents, or adults.
- **Post-vaccination serology testing and revaccination** (if anti-HBs < 10mIU/mL) is recommended for certain populations, including:
  - Infants born to HBsAg-positive mothers
  - Persons who are predialysis or on maintenance dialysis
  - Other immunocompromised persons
- For detailed revaccination recommendations, see [www.cdc.gov/vaccines/hcp/aciip/recs/vacc-specific/hepb.html](http://www.cdc.gov/vaccines/hcp/aciip/recs/vacc-specific/hepb.html).

**Note:** HepIsivax-B and PreHevrio are not recommended in pregnancy due to lack of safety data in pregnant persons

### Human papillomavirus vaccination

(minimum age: 9 years)

#### Routine and catch-up vaccination

- HPV vaccination routinely recommended at age 11–12 years (can start at age 9 years) and catch-up HPV vaccination recommended for all persons through age 18 years if not adequately vaccinated
- 2- or 3-dose series depending on age at initial vaccination:
  - **Age 9–14 years at initial vaccination:** 2-dose series at 0, 6–12 months (minimum interval: 5 months; repeat dose if administered too soon)
  - **Age 15 years or older at initial vaccination:** 3-dose series at 0, 1–2 months, 6 months (minimum intervals; dose 1 to dose 2: 4 weeks / dose 2 to dose 3: 12 weeks / dose 1 to dose 3: 5 months; repeat dose if administered too soon)
- **Interrupted schedules:** If vaccination schedule is interrupted, the series does not need to be restarted.
- No additional dose recommended when any HPV vaccine series has been completed using the recommended dosing intervals.

### Special situations

- **Immunocompromising conditions, including HIV infection:** 3-dose series, even for those who initiate vaccination at age 9 through 14 years.
- **History of sexual abuse or assault:** Start at age 9 years
- **Pregnancy:** Pregnancy testing not needed before vaccination; HPV vaccination not recommended if until after pregnancy; no intervention needed if vaccinated while pregnant.

### Influenza vaccination

(minimum age: 6 months [IV]; 2 years [LAIV4], 18 years [recombinant influenza vaccine, RIV4])

#### Routine vaccination

- Use any influenza vaccine appropriate for age and health status annually:
  - 2 doses, separated by at least 4 weeks, for **children age 6 months–8 years** who have received fewer than 2 influenza vaccine doses before July 1, 2022, or whose influenza vaccination history is unknown (administer dose 2 even if the child turns 9 between receipt of dose 1 and dose 2)
  - 1 dose for **children age 6 months–8 years** who have received at least 2 influenza vaccine doses before July 1, 2022
  - 1 dose for **all persons age 9 years or older**

• For the 2022–2023 season, see [www.cdc.gov/mmwr/volumes/71/rrr7101a1.htm](http://www.cdc.gov/mmwr/volumes/71/rrr7101a1.htm).

• For the 2023–24 season, see the 2023–24 ACIP influenza vaccine recommendations.

### Special situations

- **Egg allergy, bites only:** Any influenza vaccine appropriate for age and health status annually
- **Egg allergy with symptoms other than hives** (e.g., angioedema, respiratory distress) or required epinephrine or another emergency medical intervention: Any influenza vaccine appropriate for age and health status may be administered. If using egg-based IV4 or LAIV4, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions.
- **Severe allergic reaction** (e.g., anaphylaxis) to a vaccine component or a previous dose of any influenza vaccine: see Appendix listing contraindications and precautions
- **Clostridia contacts** (e.g., caregivers, healthcare personnel) of severely immunosuppressed persons who require a protected environment: these persons should not receive LAIV4. If LAIV4 is given, they should avoid contact with/visiting for such immunosuppressed persons for 7 days after vaccination.

### Measles, mumps, and rubella vaccination

(minimum age: 12 months for routine vaccination)

#### Routine vaccination

- 2-dose series at age 12–15 months, age 4–6 years

• MMR or MMRV may be administered

**Note:** For dose 1 in children age 12–47 months, it is recommended to administer MMR and varicella vaccines separately. MMRV may be used if parents or caregivers express a preference.

#### Catch-up vaccination

- Unvaccinated children and adolescents: 2-dose series at least 4 weeks apart
- The maximum age for use of MMRV is 12 years.
- Minimum interval between MMRV doses: 3 months

**Special situations**

- **International travel**
- **Infants age 6–11 months:** 1 dose before departure; revaccinate with 2-dose series at age 12–15 months (12 months for children in high-risk areas) and dose 2 as early as 4 weeks later.
- **Unvaccinated children age 12 months or older:** 2-dose series at least 4 weeks apart before departure
- In mumps outbreak settings, for information about additional doses of MMR (including 3rd dose of MMR), see [www.cdc.gov/mmwr/volumes/67/wr/mm6701a7.htm](http://www.cdc.gov/mmwr/volumes/67/wr/mm6701a7.htm)

**Meningococcal serogroup A, C, W, Y vaccination**

(minimum age: 2 months [MenACWY-CRM, Menvejo], 9 months [MenACWY-D, Menactra]), 2 years [MenACWY-TT, MenQuadfi]

**Routine vaccination**

- 2-dose series at age 11–12 years; 16 years

**Catch-up vaccination**

- Age 13–15 years: 1 dose now and booster at age 16–18 years (minimum interval: 8 weeks)
- Age 16–18 years: 1 dose

**Special situations**

**Anatomic or functional asplenia (including sickle cell disease), HIV infection, persistent complement component deficiency, complement inhibitor (e.g., eculizumab, ravulizumab) use:**

- **Menvejo<sup>®</sup>**
  - Dose 1 at age 2 months; 4-dose series (additional 3 doses at age 4, 6, and 12 months)
  - Dose 1 at age 3–6 months; 3- or 4-dose series (dose 2 [and dose 3 if applicable] at least 8 weeks after previous dose until a dose is received at age 7 months or older, followed by an additional dose at least 12 weeks later and after age 12 months)
  - Dose 1 at age 7–23 months; 2-dose series (dose 2 at least 12 weeks after dose 1 and after age 12 months)
  - Dose 1 at age 24 months or older; 2-dose series at least 8 weeks apart
- **Menactra<sup>®</sup>**
- **Persistent complement component deficiency or complement inhibitor use:**
  - Age 9–23 months: 2-dose series at least 12 weeks apart
  - Age 24 months or older: 2-dose series at least 8 weeks apart

- **Anatomic or functional asplenia, sickle cell disease, or HIV infection:**

- **Age 9–23 months:** Not recommended
- **Age 24 months or older:** 2-dose series at least 8 weeks apart
- **Menactra<sup>®</sup>** must be administered at least 4 weeks after completion of PCV series.
- **MenQuadfi<sup>®</sup>**
  - Dose 1 at age 24 months or older; 2-dose series at least 8 weeks apart

**Travel to countries with hyperendemic or epidemic meningococcal disease, including countries in the African meningitis belt or during the Hajj** ([www.cdc.gov/travel/](http://www.cdc.gov/travel/)):

- Children less than age 24 months:
  - **Menvejo<sup>®</sup>** (age 2–23 months)
    - Dose 1 at age 2 months; 4-dose series (additional 3 doses at age 4, 6, and 12 months)
    - Dose 1 at age 3–6 months; 3- or 4-dose series (dose 2 [and dose 3 if applicable] at least 8 weeks after previous dose until a dose is received at age 7 months or older, followed by an additional dose at least 12 weeks later and after age 12 months)
    - Dose 1 at age 7–23 months; 2-dose series (dose 2 at least 12 weeks after dose 1 and after age 12 months)
  - **Menactra<sup>®</sup>** (age 9–23 months)
    - 2-dose series (dose 2 at least 12 weeks after dose 1; dose 2 may be administered as early as 8 weeks after dose 1 in travelers)
- Children age 2 years or older: 1 dose Menvejo<sup>®</sup>, Menactra<sup>®</sup>, or MenQuadfi<sup>®</sup>

**First-year college students who live in residential housing (if not previously vaccinated at age 16 years or older) or military recruits:**

- 1 dose Menvejo<sup>®</sup>, Menactra<sup>®</sup>, or MenQuadfi<sup>®</sup> prior to age 10 years:

- **Children for whom boosters are recommended** because of an ongoing increased risk of meningococcal disease (e.g., those with complement component deficiency, HIV, or asplenia): Follow the booster schedule for persons at increased risk.
- **Children for whom boosters are not recommended** (e.g., a healthy child who received a single dose for travel to a country where meningococcal disease is endemic): Administer MenACWY according to the recommended adolescent schedule with dose 1 at age 11–12 years and dose 2 at age 16 years.

\*Menvejo has two formulations: *lyophilized and liquid*. The *liquid formulation should not be used before age 10 years*.

**Note: Menactra<sup>®</sup>** should be administered either before or at the same time as DTap. MenACWY may be administered simultaneously with MenB vaccines if indicated, but at a different anatomic site, if feasible.

For MenACWY booster dose recommendations for groups listed under “Special situations” and in an outbreak setting and additional meningococcal vaccination information, see [www.cdc.gov/mmwr/volumes/69/rr/r6909a1.htm](http://www.cdc.gov/mmwr/volumes/69/rr/r6909a1.htm).

**Meningococcal serogroup B vaccination**

(minimum age: 10 years [MenB-4C, Bexsero<sup>®</sup>], MenB-FHbp, Trumenba<sup>®</sup>)

**Shared clinical decision-making**

- **Adolescents not at increased risk** age 16–23 years (preferred age 16–18 years) based on shared clinical decision-making:
  - **Bexsero<sup>®</sup>**; 2-dose series at least 1 month apart
  - **Trumenba<sup>®</sup>**; 2-dose series at least 6 months apart (if dose 2 is administered earlier than 6 months, administer a 3<sup>rd</sup> dose at least 4 months after dose 2)

**Special situations**

**Anatomic or functional asplenia (including sickle cell disease), persistent complement component deficiency, complement inhibitor (e.g., eculizumab, ravulizumab) use:**

- **Bexsero<sup>®</sup>**: 2-dose series at least 1 month apart
- **Trumenba<sup>®</sup>**: 3-dose series at 0, 1–2, 6 months (if dose 2 was administered at least 6 months after dose 1, dose 3 not needed; if dose 3 is administered earlier than 4 months after dose 2, a 4<sup>th</sup> dose should be administered at least 4 months after dose 3)

**Note: Bexsero<sup>®</sup>** and **Trumenba<sup>®</sup>** are not interchangeable; the same product should be used for all doses in a series.

For MenB booster dose recommendations for groups listed under “Special situations” and in an outbreak setting and additional meningococcal vaccination information, see [www.cdc.gov/mmwr/volumes/69/rr/r6909a1.htm](http://www.cdc.gov/mmwr/volumes/69/rr/r6909a1.htm).



## Notes

## Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2023

### Pneumococcal vaccination (minimum age: 6 weeks [PCV13], PCV15), 2 years (PPSV23)

#### Routine vaccination with PCV

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

#### Catch-up vaccination with PCV

- Healthy children age 24–59 months with any incomplete\* PCV series: 1 dose PCV
- For other catch-up guidance, see Table 2.

**Note:** PCV13 and PCV15 can be used interchangeably for children who are healthy or have underlying conditions. PCV15 is not indicated for children who have received 4 doses of PCV13 or another age-appropriate complete PCV13 series.

#### Special situations

**Underlying conditions below: When both PCV and PPSV23 are indicated, administer PCV first. PCV and PPSV23 should not be administered during the same visit.**

**Chronic heart disease (particulary 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\* series with:
  - 3 PCV doses: 1 dose PCV (at least 8 weeks after any prior PCV dose)
  - Less than 3 PCV doses: 2 doses PCV (8 weeks after the most recent dose and administered 8 weeks apart)
- No history of PPSV23: 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV doses)

Age 6–18 years

- Any incomplete\* series with PCV: no further PCV doses needed
- No history of PPSV23: 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV doses)

#### Cerbrospinal fluid leak, cochlear implant:

Age 2–5 years

- Any incomplete\* series with:
  - 3 PCV doses: 1 dose PCV (at least 8 weeks after any prior PCV dose)
  - Less than 3 PCV doses: 2 doses PCV (8 weeks after the most recent dose and administered 8 weeks apart)
- No history of PPSV23: 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV doses)

Age 6–18 years

- No history of either PCV or PPSV23: 1 dose PCV, 1 dose PPSV23 at least 8 weeks later
- Any PCV but no PPSV23: 1 dose PPSV23 at least 8 weeks after the most recent dose of PCV
- PPSV23 but no PCV: 1 dose PCV 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; malignancy, 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\* series with:
  - 3 PCV doses: 1 dose PCV (at least 8 weeks after any prior PCV dose)
  - Less than 3 PCV doses: 2 doses PCV (8 weeks after the most recent dose and administered 8 weeks apart)
- No history of PPSV23: 1 dose PPSV23 (at least 8 weeks after completing all recommended PCV doses) and a dose 2 of PPSV23 5 years later

Age 6–18 years

- No history of either PCV or PPSV23: 1 dose PCV, 2 doses PPSV23 (dose 1 of PPSV23 administered 8 weeks after PCV and dose 2 of PPSV23 administered at least 5 years after dose 1 of PPSV23)
- Any PCV but no PPSV23: 2 doses PPSV23 (dose 1 of PPSV23 administered 8 weeks after the most recent dose of PCV and dose 2 of PPSV23 administered at least 5 years after dose 1 of PPSV23)
- PPSV23 but no PCV: 1 dose PCV (at least 8 weeks after the most recent PPSV23 dose) and a dose 2 of PPSV23 administered 5 years after dose 1 of PPSV23 and at least 8 weeks after a dose of PCV

\*Incomplete series = Not having received all doses in either the recommended series or an age-appropriate catch-up series see Table 2 in ACIP Pneumococcal recommendations at [www.cdc.gov/mmwr/volumes/71/wr/mm7137a3.htm](http://www.cdc.gov/mmwr/volumes/71/wr/mm7137a3.htm)

For guidance on determining which pneumococcal vaccines a patient needs and when, please refer to the mobile app, which can be downloaded at: [www.cdc.gov/vaccines/vpd/pneumo/hcp/pneumoapp.html](http://www.cdc.gov/vaccines/vpd/pneumo/hcp/pneumoapp.html)

### Poliovirus vaccination (minimum age: 6 weeks)

#### Routine vaccination

- 4-dose series at ages 2, 4, 6–18 months, 4–6 years; administer the final dose on or after age 4 years and at least 6 months after the previous dose.

• 4 or more doses of IPV can be administered before age 4 years when a combination vaccine containing IPV is used. However, a dose is still recommended on or after age 4 years 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.

- IPV is not routinely recommended for U.S. residents age 18 years or 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%20%20cid-mm6601a6\\_w](http://www.cdc.gov/mmwr/volumes/66/wr/mm6601a6.htm%20%20cid-mm6601a6_w).

- Only trivalent OPV (tOPV) counts toward the U.S. vaccination requirements.

- Doses of OPV administered before April 1, 2016, should be counted (unless specifically noted as administered during a campaign).

- Doses of OPV administered on or after April 1, 2016, should not be counted.

- For guidance to assess doses documented as “OPV,” see [www.cdc.gov/mmwr/volumes/66/wr/mm6606a7.htm%20%20cid-mm6606a7\\_w](http://www.cdc.gov/mmwr/volumes/66/wr/mm6606a7.htm%20%20cid-mm6606a7_w).

- For other catch-up guidance, see Table 2.

#### Special situations

**• Adolescents aged 18 years at increased risk of exposure to poliovirus with:**

- No evidence of a complete polio vaccination series (i.e., at least 3 doses); administer remaining doses (1, 2, or 3 doses) to complete a 3-dose series
- Evidence of completed polio vaccination series (i.e., at least 3 doses); may administer one lifetime IPV booster

For detailed information, see: [www.cdc.gov/vaccines/vpd/polio/hcp/recommendations.html](http://www.cdc.gov/vaccines/vpd/polio/hcp/recommendations.html)

**Rotavirus vaccination**

(minimum age: 6 weeks)

**Routine vaccination**

- **Rotarix**®: 2-dose series at age 2 and 4 months
- **Rotateq**®: 3-dose series at age 2, 4, and 6 months
- If any dose in the series is either **Rotarix**® 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 Table 2.

**Tetanus, diphtheria, and pertussis (Tdap) vaccination**

(minimum age: 11 years for routine vaccination, 7 years for catch-up vaccination)

**Routine vaccination**

- **Adolescents age 11–12 years:** 1 dose Tdap
- **Pregnancy:** 1 dose Tdap during each pregnancy, preferably in 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 age 13–18 years who have not received Tdap:** 1 dose Tdap, then Td or Tdap booster every 10 years
- **Persons age 7–18 years not fully vaccinated<sup>a</sup> with DTaP:** 1 dose Tdap as part of the catch-up series (preferably the first dose); if additional doses are needed, use Td or Tdap.
- **Tdap administered at age 7–10 years:**
  - **Children age 7–9 years** who receive Tdap should receive the routine Tdap dose at age 11–12 years.
  - **Children age 10 years** who receive Tdap do not need the routine Tdap dose at age 11–12 years.
- **DTaP inadvertently administered on or after age 7 years:**
  - **Children age 7–9 years:** DTaP may count as part of catch-up series. Administer routine Tdap dose at age 11–12 years.
  - **Children age 10–18 years:** Count dose of DTaP as the adolescent Tdap booster.
- For other catch-up guidance, see Table 2.

**Special situations**

- **Wound management** in persons age 7 years or older with history of 3 or more doses of tetanus-toxoid-containing vaccine: For clean and minor wounds, administer Tdap or Td if more than 10 years since last dose of tetanus-toxoid-containing vaccine; for all other wounds, administer Tdap or Td if more than 5 years since last dose of tetanus-toxoid-containing vaccine. Tdap is preferred for persons age 11 years or older who have not previously received Tdap or whose Tdap history is unknown. If a tetanus-toxoid-containing vaccine is indicated for a pregnant adolescent, use Tdap.
- For detailed information, see [www.cdc.gov/mmwr/volumes/69/wr/mm6903a5.htm](http://www.cdc.gov/mmwr/volumes/69/wr/mm6903a5.htm).
- **Fully vaccinated** = 5 valid doses of DTaP OR 4 valid doses of DTaP if dose 4 was administered at age 4 years or older

**Varicella vaccination**

(minimum age: 12 months)

**Routine vaccination**

- 2-dose series at age 12–15 months, 4–6 years
- VAR or MMRV may be administered<sup>b</sup>
- Dose 2 may be administered as early as 3 months after dose 1 (a dose inadvertently administered after at least 4 weeks may be counted as valid)
- **Note:** For dose 1 in children age 12–47 months, it is recommended to administer MMR and varicella vaccines separately. MMRV may be used if parents or caregivers express a preference.

**Catch-up vaccination**

- Ensure persons age 7–18 years without evidence of immunity (see [MMWR](http://www.cdc.gov/mmwr/pdf/rtrr5604.pdf) at [www.cdc.gov/mmwr/pdf/rtrr5604.pdf](http://www.cdc.gov/mmwr/pdf/rtrr5604.pdf)) have a 2-dose series:
- **Age 7–12 years:** Routine interval: 3 months (a dose inadvertently administered after at least 4 weeks may be counted as valid)
- **Age 13 years and older:** Routine interval: 4–8 weeks (minimum interval: 4 weeks)
- The maximum age for use of MMRV is 12 years.

# Appendix

## Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2023

### Guide to Contraindications and Precautions to Commonly Used Vaccines

Adapted from Table 4-1 in *Advisory Committee on Immunization Practices (ACIP) General Best Practice Guidelines for Immunization: Contraindication and Precautions available at [www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html) and ACIP's Recommendations for the Prevention and Control of 2022-23 seasonal Influenza with Vaccines available at [www.cdc.gov/mmwr/volumes/71/rr/r7101a1.htm](http://www.cdc.gov/mmwr/volumes/71/rr/r7101a1.htm).*

**For COVID-19 vaccine contraindications and precautions see [www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#contraindications](http://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#contraindications)**

Vaccine	Contraindicated or Not Recommended <sup>1</sup>	Precautions <sup>2</sup>
Influenza, egg-based, inactivated injectable (IIV4)	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after previous dose of any influenza vaccine (i.e., any egg-based IIV, cdlV, RIV, or LAV of any valency)</li> <li>Severe allergic reaction (e.g., anaphylaxis) to any vaccine component<sup>3</sup> (excluding egg)</li> </ul>	<ul style="list-style-type: none"> <li>Guilain-Barré syndrome (GBS) within 6 weeks after a previous dose of any type of influenza vaccine</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Influenza, cell culture-based inactivated injectable (ICdlV4), Flucelex <sup>®</sup> Quadrivalent	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) to any cdlV of any valency, or to any component<sup>3</sup> of ICdlV4</li> </ul>	<ul style="list-style-type: none"> <li>Guilain-Barré syndrome (GBS) within 6 weeks after a previous dose of any type of influenza vaccine</li> <li>Persons with a history of severe allergic reaction (e.g., anaphylaxis) after a previous dose of any egg-based IIV, RIV, or LAV of any valency. If using cdlV4, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions. May consult an allergist.</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Influenza, recombinant injectable (RIV4), Flublok <sup>®</sup> Quadrivalent	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) to any RIV of any valency, or to any component<sup>3</sup> of RIV4</li> </ul>	<ul style="list-style-type: none"> <li>Guilain-Barré syndrome (GBS) within 6 weeks after a previous dose of any type of influenza vaccine</li> <li>Persons with a history of severe allergic reaction (e.g., anaphylaxis) after a previous dose of any egg-based IIV, cdlV, or LAV of any valency. If using RIV4, administer in medical setting under supervision of health care provider who can recognize and manage severe allergic reactions. May consult an allergist.</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Influenza, live attenuated (LAIV4), Flumist <sup>®</sup> Quadrivalent	<ul style="list-style-type: none"> <li>Severe allergic reaction (e.g., anaphylaxis) after previous dose of any influenza vaccine (i.e., any egg-based IIV, cdlV, RIV, or LAV of any valency)</li> <li>Severe allergic reaction (e.g., anaphylaxis) to any vaccine component<sup>3</sup> (excluding egg)</li> <li>Children age 2–4 years with a history of asthma or wheezing</li> <li>Anatomic or functional asplenia</li> <li>Immunocompromised due to any cause including, but not limited to, medications and HIV infection</li> <li>Close contacts or caregivers of severely immunosuppressed persons who require a protected environment</li> <li>Pregnancy</li> <li>Cochlear implant</li> <li>Active communication between the cerebrospinal fluid (CSF) and the oropharynx, nasopharynx, nose, ear or any other cranial CSF leak</li> <li>Children and adolescents receiving aspirin or salicylate-containing medications</li> <li>Received influenza antiviral medications oseltamivir or zanamivir within the previous 48 hours, peramivir within the previous 5 days, or baloxavir within the previous 17 days</li> </ul>	<ul style="list-style-type: none"> <li>Guilain-Barré syndrome (GBS) within 6 weeks after a previous dose of any type of influenza vaccine</li> <li>Asthma in persons aged 5 years old or older</li> <li>Persons with underlying medical conditions (other than those listed under contraindications) that might predispose to complications after wild-type influenza virus infection (e.g., chronic pulmonary, cardiovascular (except isolated hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders (including diabetes mellitus))</li> <li>Moderate or severe acute illness with or without fever</li> </ul>

- When a contraindication is present, a vaccine should NOT be administered. Kroger A, Bahta L, Hunter P. ACIP General Best Practice Guidelines for Immunization. [www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html)
- When a precaution is present, vaccination should generally be deferred but might be indicated if the benefit of protection from the vaccine outweighs the risk for an adverse reaction. Kroger A, Bahta L, Hunter P. ACIP General Best Practice Guidelines for Immunization. [www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html](http://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html)
- Vaccination providers should check FDA-approved prescribing information for the most complete and updated information, including contraindications, warnings, and precautions. Package inserts for U.S.-licensed vaccines are available at [www.fda.gov/vaccines-blood-biologics/approved-products/vaccines-licensed-use-united-states](http://www.fda.gov/vaccines-blood-biologics/approved-products/vaccines-licensed-use-united-states)

# Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger, United States, 2023

## Appendix

Vaccine	Contraindicated or Not Recommended <sup>1</sup>	Precautions <sup>2</sup>
Dengue (DENV2C1D)	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Immunoconferencing, long-term immunosuppressive therapy or patients with HIV infection who are severely immunocompromised<sup>4</sup></li> <li>Lack of laboratory confirmation of a previous Dengue infection</li> </ul>	<ul style="list-style-type: none"> <li>Pregnancy</li> <li>Recent immunosuppression or use of immunosuppressive drugs</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Diphtheria, tetanus, acellular pertussis (DTaP) <sup>5</sup> Tetanus, diphtheria (DT) <sup>6</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Encephalopathy (eg, coma, decreased level of consciousness, protracted seizure) not attributable to another identifiable cause within 7 days of administration of previous dose of DTaP or DTaP</li> <li>Encephalopathy (eg, coma, decreased level of consciousness, protracted seizure) not attributable to another identifiable cause within 7 days of administration of previous dose of DTaP or DTaP</li> </ul>	<ul style="list-style-type: none"> <li>Guinea-Besset type illness (GBI) within 6 weeks after receipt of a vaccine dose of tetanus, diphtheria, or tetanus-toxin-containing vaccine, after vaccination until at least 10 years have elapsed since the last dose of tetanus-toxin-containing vaccine, after vaccination until at least 10 years have elapsed since the last dose of tetanus-toxin-containing vaccine</li> <li>For DTaP only: Progressive neurologic disorder, including infantile spasms, uncontrolled epilepsy, progressive encephalopathy, or other neurologic status, clarified and stabilized</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Influenza (influenza) type (h3N2v) (h3N2v)	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Encephalopathy (eg, coma, decreased level of consciousness, protracted seizure) not attributable to another identifiable cause within 7 days of administration of previous dose of DTaP or DTaP</li> <li>Less than age 6 weeks</li> </ul>	<ul style="list-style-type: none"> <li>Moderate or severe acute illness with or without fever</li> </ul>
Hepatitis A (HepA)	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Encephalopathy (eg, coma, decreased level of consciousness, protracted seizure) not attributable to another identifiable cause within 7 days of administration of previous dose of DTaP or DTaP</li> </ul>	<ul style="list-style-type: none"> <li>Moderate or severe acute illness with or without fever</li> </ul>
Hepatitis B (HepB)	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Encephalopathy (eg, coma, decreased level of consciousness, protracted seizure) not attributable to another identifiable cause within 7 days of administration of previous dose of DTaP or DTaP</li> </ul>	<ul style="list-style-type: none"> <li>Moderate or severe acute illness with or without fever</li> </ul>
Hepatitis A and Hepatitis B vaccine (HepA/B) <sup>7</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Encephalopathy (eg, coma, decreased level of consciousness, protracted seizure) not attributable to another identifiable cause within 7 days of administration of previous dose of DTaP or DTaP</li> <li>Less than age 6 weeks</li> </ul>	<ul style="list-style-type: none"> <li>Moderate or severe acute illness with or without fever</li> </ul>
Human papillomavirus (HPV)	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Pregnancy</li> <li>HPV vaccination not recommended</li> </ul>	<ul style="list-style-type: none"> <li>Moderate or severe acute illness with or without fever</li> </ul>
Measles, mumps, rubella (MMR) <sup>8</sup> Measles, mumps, rubella, and varicella (MMRV) <sup>9</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Severe immunodeficiency (eg, hematologic and solid tumors, except of chemotherapy)</li> <li>HPV infection with an underlying immunosuppressive therapy or patients with HIV infection who are severely immunocompromised</li> <li>Pregnancy</li> <li>Family history of inherited immunocompetence, unless verified clinically or genetically</li> </ul>	<ul style="list-style-type: none"> <li>History of (1) thrombocytopenia or thrombocytopenic purpura</li> <li>History of (2) congenital or acquired immunodeficiency (eg, HIV infection, congenital immunodeficiency, or other immunodeficiency) (GBI) testing</li> <li>Moderate or severe acute illness with or without fever</li> <li>For MMRV only: Personal or family (ie, sibling or parent) history of seizures of any etiology</li> </ul>
Meningococcal ACWY (MenACWY) <sup>10</sup> MenACWY-CRM (Meneco) <sup>11</sup> MenACWY-D (Menactra) <sup>12</sup> MenACWY-TT (MenQuadfi) <sup>13</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>For MenACWY-D and MenACWY-CRM only: severe allergic reaction to any diphtheria toxin- or CRM197-containing vaccine</li> <li>For MenACWY-TT only: severe allergic reaction to a beta-lactam bound-containing vaccine</li> </ul>	<ul style="list-style-type: none"> <li>For MenACWY-CRM only: Protein birth flaws that began 9 months before vaccination</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Meningococcal B (MenB) <sup>14</sup> MenB-FHig (Trumenb) <sup>15</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>Pregnancy</li> <li>For MenB only: Latex sensitivity</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Prevnar pneumococcal conjugate (PCV) <sup>16</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>Moderate or severe acute illness with or without fever</li> </ul>
Pneumococcal polysaccharide (PPV23) <sup>17</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>Moderate or severe acute illness with or without fever</li> </ul>
Polio vaccine, inactivated (IPV) <sup>18</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Severe combined immunodeficiency (SCID)</li> <li>History of intussusception</li> </ul>	<ul style="list-style-type: none"> <li>Pregnancy</li> <li>Recent immunosuppression other than SCID</li> <li>RV only: Spina birds or bladder extrophy</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Rh blood (Rh) (Rho(D)) <sup>19</sup> Rho (D) immune globulin (Rho(D)IG) <sup>20</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Severe combined immunodeficiency (SCID)</li> <li>History of intussusception</li> </ul>	<ul style="list-style-type: none"> <li>Pregnancy</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Tetanus, diphtheria, and acellular pertussis (Tdap) <sup>21</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Severe immunodeficiency (eg, hematologic and solid tumors, except of chemotherapy)</li> <li>HPV infection who are severely immunocompromised</li> <li>Pregnancy</li> <li>Family history of inherited immunocompetence, unless verified clinically or genetically</li> <li>Family history of inherited immunocompetence, unless verified clinically or genetically</li> </ul>	<ul style="list-style-type: none"> <li>Guinea-Besset syndrome (GBS) within 6 weeks after a previous dose of tetanus-toxin-containing vaccine or tetanus-toxin-containing vaccine, after vaccination until at least 10 years have elapsed since the last dose of tetanus-toxin-containing vaccine</li> <li>For Tdap only: Progressive neurologic disorder, including infantile spasms, or progressive encephalopathy until a treatment regimen has been established and the condition has stabilized</li> <li>Moderate or severe acute illness with or without fever</li> </ul>
Varicella (VAR) <sup>22</sup>	<ul style="list-style-type: none"> <li>Severe allergic reaction (eg, anaphylaxis) after a previous dose or to a vaccine component<sup>3</sup></li> <li>Severe immunodeficiency (eg, hematologic and solid tumors, except of chemotherapy)</li> <li>HPV infection who are severely immunocompromised</li> <li>Pregnancy</li> <li>Family history of inherited immunocompetence, unless verified clinically or genetically</li> <li>Family history of inherited immunocompetence, unless verified clinically or genetically</li> </ul>	<ul style="list-style-type: none"> <li>Recent (1) receipt of an antibody-containing blood product (specific interval depends on product)</li> <li>Receipt of specific anti-diphtheria toxin (eg, antitoxin, immunoblock, or valyodine) 24 hours before vaccination (avoid use of aspirin or aspirin-containing products)</li> <li>Use of aspirin or aspirin-containing products</li> <li>Moderate or severe acute illness with or without fever</li> <li>For MMRV only: For MMRV for additional precautions</li> </ul>

1. When a contraindication is present, a vaccine should NOT be administered. Kroger A, Bahta L, Hunter P. ACP General Best Practice Guidelines for Immunization. [www.acp.org/vaccines/best-practice-guidelines](http://www.acp.org/vaccines/best-practice-guidelines)

2. When a precaution is present, vaccination should generally be deferred but might be indicated if the benefit of protection from the vaccine outweighs the risk for an adverse reaction. Kroger A, Bahta L, Hunter P. ACP General Best Practice Guidelines for Immunization. [www.acp.org/vaccines/best-practice-guidelines](http://www.acp.org/vaccines/best-practice-guidelines)

3. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

4. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

5. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

6. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

7. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

8. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

9. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

10. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

11. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

12. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

13. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

14. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

15. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

16. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

17. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

18. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

19. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

20. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

21. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)

22. Guidelines for immunization. [www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html](http://www.cdc.gov/vaccines/imz-manual/ncid/vac/infos/immz.html)